# PHOENIX
## MEDICAL JOURNAL

### Anka Tıp Dergisi

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2. Akdeniz YS, Cakmak F, Ipekci A, Ikizceli I, Karatas KF, Berberoglu DB, et al. Videoscopic assisted retroperitoneal debridement in infected necrotizing pancreatitis. Phnx Med J. 2020;9(2):156-159. DOI: 10.1080/13651820701225688.

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Book section

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Cakmak F, Ipekci A, editors. Mental health care for elderly people. Istanbul: Fatih Yayınevi; 2019.

Written at the meeting

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Thesis

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Text published in electronic format

U.S. Department of Health and Human Services: The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.

http://www.cdc.gov/tobacco/data_statistics/sgr/2006/pdfs/what-is-shs.pdf. Accessed 30 Nov 2014.

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- Turkish and English titles
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- Keywords (minimum 3; maximum 6)
- Article divided into appropriate sections
- Complete and accurate references and citations
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- All figures (with legends) and tables (with titles) cited.
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# Yoğun Bakımda Ateşin Yönetilmesi

## Managing Fever in Critical Care

İD Emel Yıldız

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**ABSTRACT**
Fever; is one of the most common abnormal symptoms in patients admitted to adult intensive care units (ICUs) and is associated with increased mortality in critically ill populations. Fever in the ICUs affects important diagnosis and treatment decisions. It usually occurs early, is often non-infective, and is usually benign. Fever in the ICUs can be caused by infectious and non-infectious reason.. The cornerstone of treatment is to treat the underlying cause of the fever. There is a need for the clinician to determine the best evidence-based approach for the identification and treatment of fever by paying attention to appropriate body temperature measurement, diagnostic evaluation, replacement of indwelling catheters, administration of antipyretic drugs, antibiotic therapy in critical patient follow-up in the İCUs, through literature analysis.

**ÖZET**
Ateş; yetişkin yoğun bakım ünitelerine (YBÜ) kabul edilen hastalarda en sık saptanan anormal belirtilerden biridir ve kritik hasta popülasyonlarında artan mortalite ve morbidite ile ilişkilidir. YBÜ' de ateş, önemli tanı ve tedavi kararlarını etkilemektedir. Genellikle erken döneminde ortaya çıkar, sıklıkla enfektif değildir ve genellikle iyi huyludur. YBÜ' deki ateş enfeksiyöz ve enfeksiyöz olmayan nedenlerden kaynaklı olabilir. Tedavinin temel taşı, ateşin altında yatan nedeni tedavi etmektir. Klinisyenin yoğun bakımda kritik hasta takibinde uygun vücut ısısı ölçümüne, tanısal değerlendirmeye, kalıcı kateterlerin değiştirilmesine, ateş düşürücü ilaçların uygulanmasına, antibiyotik tedavisine, dikkat ederek ateşi tanımlanması ve tedavisine yönelik en iyi kanıta dayalı yaklaşımın literatür analizi yoluyla belirlenmesine ihtiyaç vardır.

## GİRİŞ

Ateş, organizmaların sıklıkla enfeksiyöz ajanlar karşısında kendilerini geçici olarak termal strese maruz bıraktığı bir yanıttır (1). Yüksek vücut ısısı, pireksi veya hipertermi olarak sınıflandırılır. Bu iki terim sıklıkla birbirinin yerine kullanılsa da, biyolojik mekanizmaları ve tedaviye yanıtları farklıdır bu nedenle ayrımları önemlidir. Amerikan Yoğun Bakım ve Enfeksiyon Hastalıkları Dernekleri yoğun bakım hastaları için oluşturdukları ortak rehberde 38.3°C ve üzerindeki vücut sıcaklığının ateş olarak değerlendirilmesini önermektedir (2). Ulusal Febril Nötropeni Derneği Çalışma Gurubu'nun hazırladığı kılavuzda ateş oral veya aksiller olarak bir kez 38.3 C°'den yüksek veya 1 saat süre ile 38-38.2 C°'olması olarak tanımlanır. Mackowiak ve ark ateş >41.1 °C üzerinde ise hiperpreksi olarak tanımlanmaktadır (3). Ateş >41.1 °C ise ilaç ateşi, santral ateş, kanama, travma, malignite, sıcak çarpması ve malign hipertermi düşünülmelidir.

Düşük düzeyde ve 5 günden kısa süreli yükselmelerde genellikle enfeksiyon dışı nedenler düşünülmelidir. Bunlar; Akut Respiratuar Disstres Sendromu (ARDS), pankreatit, miyokard enfarktüsü, hematom, pulmoner emboli, dekübit ülserleri ve derin ven trombozu düşünülmelidir. Düşük düzeyde ve 5 günden uzun süreli ateşde nozokomiyal enfeksiyon, nedeni bilinmeyen ateş, ilaç ateşi, kateter ilişkili bakteriüri, trakeabronşit akla gelmelidir. Ateş; endojen pirojenik ve antipiretik yollarla sıkı bir şekilde düzenlenen fizyolojik strese adaptif bir yanıttır ve hipotalamik ayar noktasındaki bir artışla ilişkilidir(4). Bu nedenle, ateşi olan hastalarda yüksek vücut ısısı, asetaminofen gibi ateş düşürücülere yanıt verir. Aksine, hipertermi sendromlarında meydana gelen yüksek vücut ısısı sıklıkla 41.0 °C'yi aşar ve vücut sıcaklığındaki artış, hipotalamik ayar noktası ile ilişkili olmayan patolojik bir artışı yansıtır. Hipertermideki bu yüksek sıcaklık ateş düşürücülere yanıt vermez. Pireksi ve ateş birbirinin yerine kullanılabilirken, hipertermi yada hiperpireksi, spesifik çevresel, farmakolojik veya endokrin uyaranlara eşlik eden sendromu ifade edecektir (Şekil 1) (5). Nöropatik malign sendrom, malign hipertermi ve serotonin sendromu en çok bilinen ilaç reaksiyonu sonrasında gelişen hipertermi durumlarıdır. Çeviker ve ark esitalopram tedavisi alan hastada linezolide bağlı gelişen serotonin sendromu bir olgunun takip ve tedavisini yapmışlardır (6).

Ateşli hastalık sırasında ortaya çıkan hipertermiye maruz kalmanın; gen ekspresyonu, hücre sinyali ve lökosit ve makrofaj alımını, endotelyal paraselüler yolların
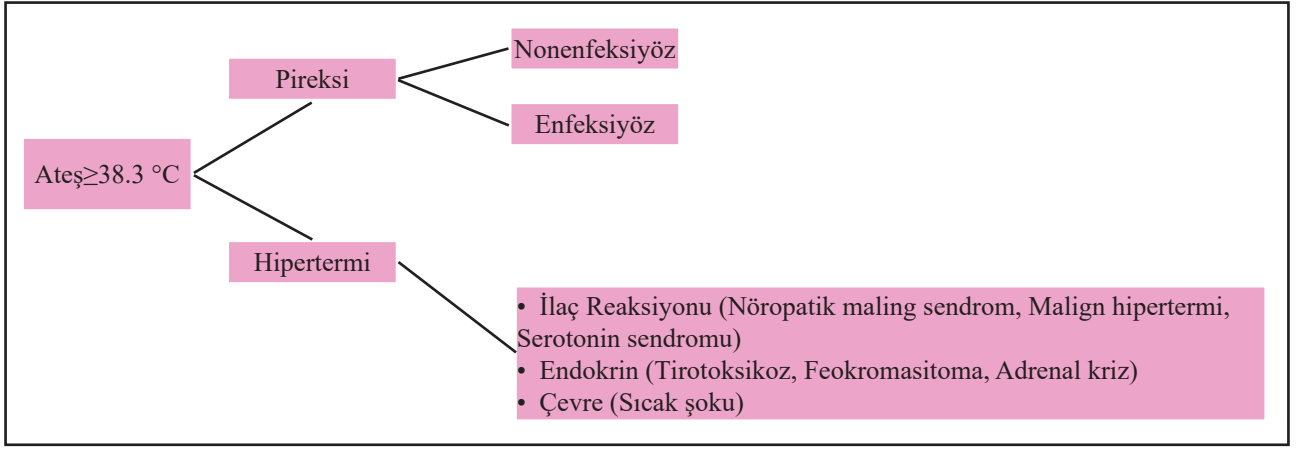
**Şekil 1:** Ateş nedenleri

makromoleküllere açılmasını ve epitelde dış apoptozu arttırmayı içeren hücre davranışı üzerinde birçok etkiye sahip olduğunu göstermektedir. Bu etkiler hem faydalı hem de zararlı olabilir ve konakçının hayatta kalması ve iyileşmesi patolojik sürecin doğasına bağlıdır (7).

**VÜCUT ISISININ DÜZENLENMESİ**

Termoregülasyon, vücut sıcaklığını sıkı bir şekilde düzenlenmiş bir aralıkta tutan temel bir homeostatik mekanizmadır. Vücut ısısının dahili olarak düzenleme yeteneği endotermi olarak bilinir ve tüm memelilerin ve kuşların bir özelliğidir. Termoregülatuar sistem, bir afferent duyusal organ, bir işlem merkezi ve bir efferent yanıt organından oluşur. İnsanlarda termoregülatuar ayar noktasını kontrol eden işlem merkezi hipotalamustur. Hem sıcağa duyarlı hem de soğuğa duyarlı termoreseptörler, afferent organda yer alır. Soğuğa duyarlı reseptörlerin uyarılması, hipotalamus aracılığıyla iletilen, ısı kaybını azaltan ve ısı üretimini artıran efferent yanıtları harekete geçirir. Bu tepkiler, periferlere kan akışını azaltmayı ve titremeyi içeren mekanizmalarla ısı üretimini artırmayı içerir. Isı merkezi enfeksiyona, yaralanmaya, inflamasyona ve antijenik değişikliklere karşı konak yanıtı olarak üretilen "endojen pirojenler (EP)" tarafından uyarılır. Bu pirojenler hipotalamustaki biyokimyasal değişiklikleri tetikleyerek ateşe neden olurlar (Şekil 2).

Ateş patogenezinde rol alan bu sitokinler (EP) (8).

• IL-1 (α,β); bilinen en güçlü EP'dirler.
• Tümör Nekroz Faktör (α,β),
• IL-6, İnterferon (IFN); En güçlü pirojenik IFN, IFN-α'dır.

Ateş; YBÜ'ne kabul edilen hastalarda en sık
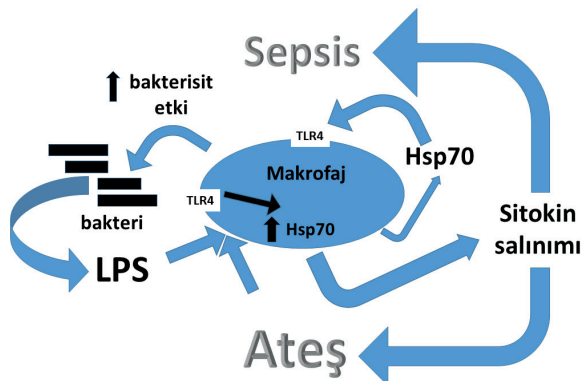


**Şekil 2:** Ateş yanıtı

saptanan anormal belirtilerden biridir ve kritik hasta popülasyonlarında artan mortalite ve morbidite ile ilişkilidir. YBÜ'de ateş, önemli tanı ve tedavi kararlarını etkilemektedir. Ateşin şiddeti, paterni ve nabızla olan ilişkisi önemlidir. Her 1°C ateş artışı için oksijen tüketimi ve kardiyak output % 10 artar. Normal şartlarda ateş 1.3 ° C arttığında kalp hızının dakikada 10 vuru artması beklenir (9). Yetişkin yoğun bakım ünitelerine kabul edilen hastaların yaklaşık %50'sinde yüksek vücut ısısı tespit edilir (1). Yoğun bakım ünitesinde ateşin tanımı, epidemiyolojisi, etiyolojileri, tanısal değerlendirmesi önemlidir. Ateş ölçümleri intravasküler, intravezikü ler ve rektal ölçümlerin yanında; oral, aksiler, temporal arter ve timpanik bölgelerden de yapılabilir. Deri yüzeyinden ısı ölçümü hızlı, güvenilir ve noninvazivdir. Bunun için objelerden yayılan elektromanyetik dalgaların ölçümü ile sıcaklığın belirlenmesi prensibiyle çalışan infrared termometreler kullanılır. Pulmoner arter kateteri ile ateş ölçülmesi, her zaman pratik olmayabilir. Kateter intravenöz sıvı verilmek için de kullanıldığı için bazen güvenilir olmayan sıcaklık değerleri verebilir (10).

YBÜ'ne yattığı sırada ateşi olmayan bir hastada yattıktan sonra eğer ateş yükselirse, doğal olarak önce nozokomiyal bir infeksiyon akla gelir.

Yoğun bakımda ateş %26 ile %70 arasında görülür (11). Yoğun bakım ünitesindeki ateş enfeksiyöz ve enföksiyöz olmayan nedenlerden kaynaklı olabilir (Şekil 3,4). Ancak ateşli vakaların yarısı enfektedir. Enfeksiyöz ve enfeksiyöz olmayan ateşlerin sıklığı, çalışılan popülasyona ve kullanılan enfeksiyon tanımına göre değişir. Değerlendirme sırasında yoğun bakım hekimleri, kritik durumdaki hastaların sıklıkla birden fazla enfeksiyonu olabileceğini unutmamalıdırlar. Ek olarak, hasta bağışıklık sistemi baskılanmışsa enfeksiyon ve inflamasyon yanıtı değişebilir. Tıbbi teknolojiler ( sürekli renal replasman tedavisi ve ekstrakorporeal membran oksijenasyonu (ECMO)) ateşi değiştirebilir. Karasu ve ark yoğun bakımda sağlık bakımı ile ilişkili enfeksiyonları değerlendirdiği bir çalışmasında en sık kan dolaşımı enfeksiyonu (%48) ve ventilatörle ilişkili pnömoni (VİP) (%33) geliştiğini saptamışlardır (12).

Ateş, yoğun bakım ünitesinde sık görülen bir olaydır. Genellikle erken döneminde ortaya çıkar, sıklıkla enfektif değildir ve genellikle iyi huyludur. Uzun süreli ateş, kötü bir sonuçla ilişkilidir (13). Çeşitli yoğun bakım
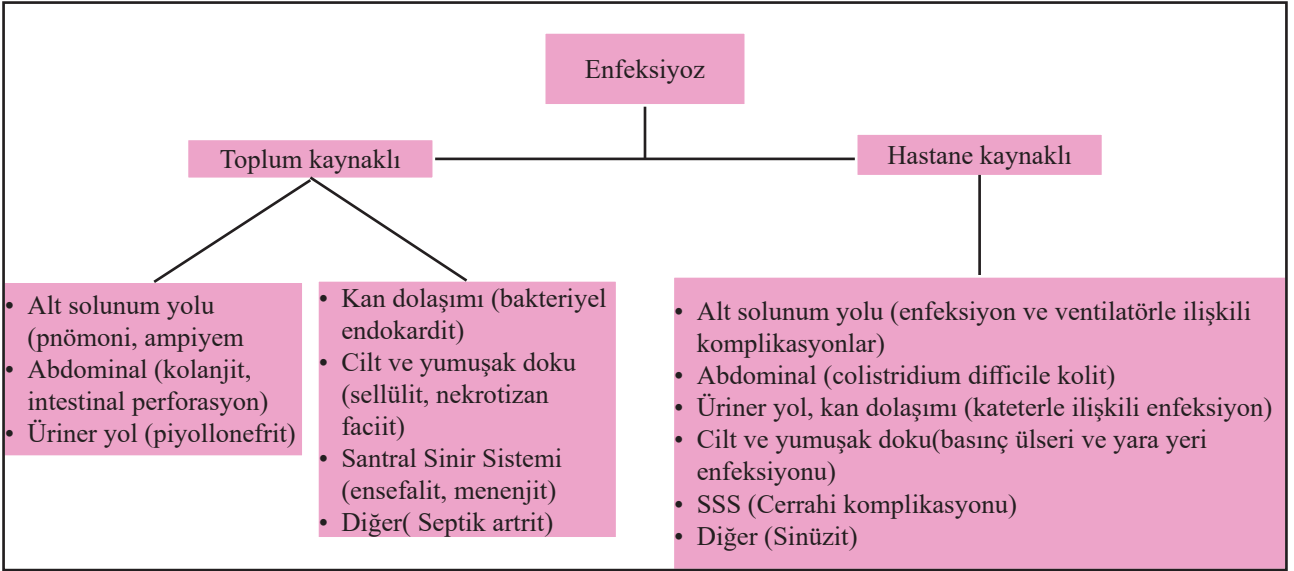
**Şekil 3:** Ateşin enfeksiyoz nedenleri
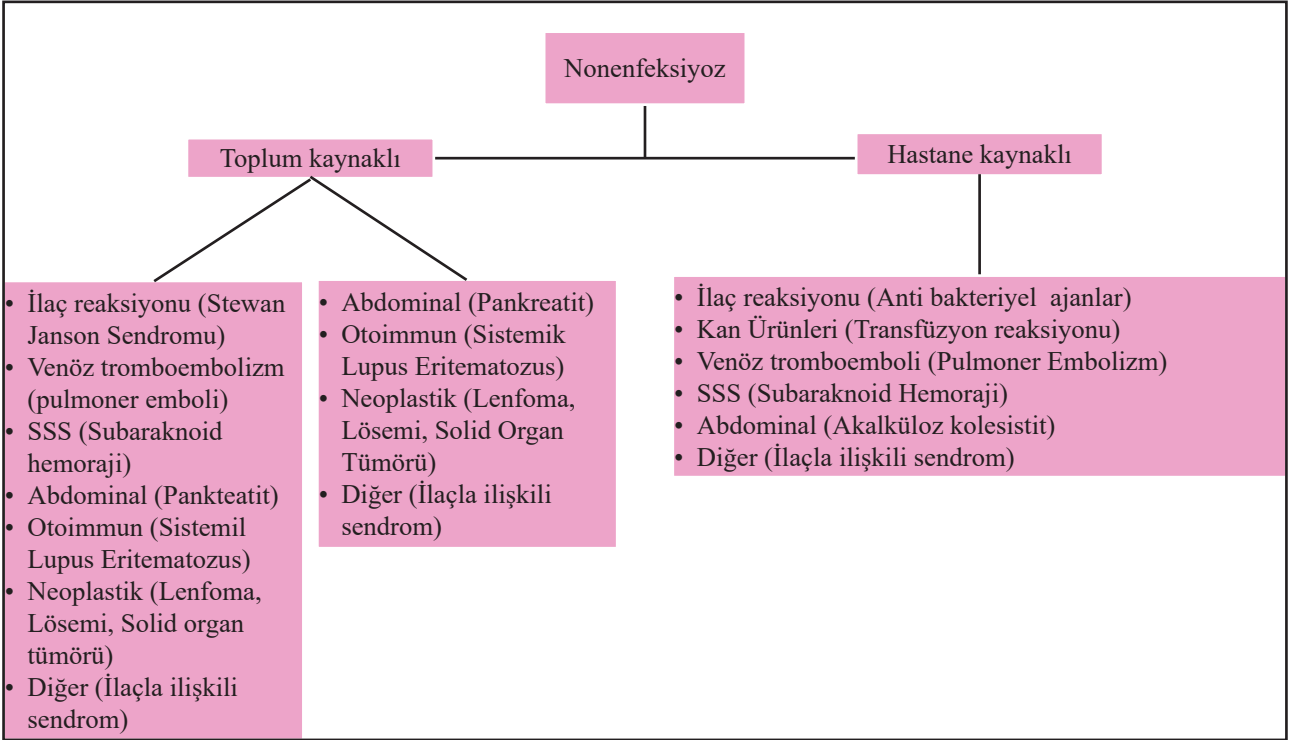


**Şekil 4:** Ateşin nonenfeksiyoz nedenleri

uygulamalarında gözlemlenen ve enfeksiyon kaynaklı ateş sıklığı % 8 - 37 aralığında olduğu belirtilmiştir (14). Yoğun bakım hekimi, ateş odağını aramak için balgam veya endotrakeal sekresyonların kalitesini (renk, koku, miktar ve kıvam) değerlendirmelidir. Ayrıca, özellikle intravasküler kateterler, üriner kateterler veya göğüs ve karın drenleri gibi ek uygulamaların varlığını değerlendirmelidir. Kateter ile ilişkili enfeksiyon; en az 2 gündür santral venöz kateter takılı olan bir hastada gelişen primer kan dolaşımı enfeksiyonudur. Santral venöz kateter kullanımı artmasına rağmen kateter kullanım süresinin ve kateter değişiminin ne zaman ve nasıl yapılacağı ile ilgili net bilgiler yoktur (15).

Yoğun bakımda yatışı sırasında enfeksiyon gelişen hastada; apse, akalküloz kolesistit, pankreatit veya mezenterik iskemi olup olmadığını belirlemek için ayrıntılı bir göğüs ve karın muayenesi yapmalıdır. Ateşin piki artıyorsa infektif endokardit ve septik tromboflebitler gibi komplikasyonlar düşünülmelidir. Üfürümlerin, endokarditi düşündürmesi için kalp sesleri dikkatle dinlenmelidir. Ağız, cilt, eklemler ve alt ekstremiteler, kötü ağız hijyeni, yara enfeksiyonları ve selülit, lenfadenit, septik artrit veya osteomiyelit varlığı da aranarak incelenmelidir. Derin ven trombozu düşündüren ekstremitelerde şişlik, eritem veya hassasiyet varlığı incelenmelidir. Kullanılan ilaçların asepsi kurallarına uygun yapılıp yapılmadığı, total parenteral beslenme, kan ürünü transfüzyonu ve önceki mikrobiyolojik öykü de değerlendirilmelidir. Tüm kapalı yaralardan pansuman veya alçı çıkarılmalı ve yaralar incelenmelidir (16).

Yara bakımı yapılırken yara değerlendirip uygun tedavi seçilmelidir (17).

YBÜ'ne yattığı sırada ateşi olmayan bir hastada yattıktan sonra eğer ateş yükselirse, doğal olarak önce nozokomiyal bir infeksiyon akla gelir. Nozokomiyal enfeksiyonlar (NE); hastaneye yatıştan 48-72 saat sonra hastanede ya da taburcu olduktan sonra 10 gün içinde gelişen enfeksiyonlardır (Tablo 1).

Ateşin altında yatan nedeni belirlemek zordur. Bir hastanın ateşinin birçok nedenle olabilir. Ancak organize bir yaklaşımın kullanılması yoğun bakım hekiminin doğru tanıya ulaşmasına yardımcı olacaktır. Bu süreçteki ilk adım, kapsamlı bir fiziksel ve mevcut hastalık geçmişinin bir değerlendirmesinin yanı sıra hastanın tüm ilaçlarının ayrıntılı bir incelemesini içeren eksiksiz biranamnezdir. . Enfeksiyon ateşin nedeni için her zaman birincil düşünce

**Tablo 1:** Enfeksiyonlu yoğun bakım hastalarında ateş yönetimi (8).

| Çalışma | Epidemiyoloji | Sonuç |
|---|---|---|
| Laupland ve ark. 2008 (11) | 2000 ve 2006 Calgary*'de 4 YBÜ Retrospektif kohort çalışması; n = 24.204 | • YBÜ yatışlarının %44'ünde ≥ 38.3 °C ateş ve başvuruların %8'inde ≥ 39.3 °C yüksek ateş gelişti • Ateş, YBÜ mortalitesinde artışla ilişkili değildi, ancak yüksek ateş, önemli ölçüde artmış ölüm riskiyle ilişkilendirildi. |
| Genç ve ark. 2011 (18) | 2010 yılında Avustralya ve Yeni Zelanda'daki üç 3. basamak YBÜ 6 hafta boyunca ateşi > 38 °C olan ve enfeksiyonlu olduğu bilinen veya şüphelenilen hastalar kohort çalışması; n = 565 | YBÜ kabul edilen hastaların % 9'unda ateş ve bilinen veya şüphelenilen enfeksiyon vardı veya gelişti |
| Selladurai ve ark. 2011 (19) | Aralık 2009 - Ağustos 2010 Avustralya'da sepsis tanısı ile 3. basamak YBÜ kabul edilen hastalar retrospektif kohort çalışması; n= 106 | • Septik hastaların %69'u YBÜ'deki ilk 7 gününde en az bir kez parasetamol almıştır • Ateşi > 38 °C olan septik hastaların %88'i YBÜ'deki ilk 7 gününde parasetamol almıştır • Ateşi > 38 °C olan septik hastalar ateşli olmayan septik hastalara göre parasetamol alma olasılığı 6.8 kat daha fazlaydı |
| Lee ve ark. 2012 (20). | 2009 3 ay boyunca Japonya ve Kore'de 25 YBÜ 48 saatten fazla kabul edilen hastalar kohort çalışması; n = 1425 | • NSAİİ kullanımı, sepsisli hastalarda 28 günlük mortalite artışı ile bağımsız olarak ilişkilidir ancak sepsis olmayan hastalarda 28 günlük mortalitede azalmaya yönelik bir eğilim vardır. • Parasetamol kullanımı sepsisli hastalarda 28 günlük mortalite artışı ile bağımsız olarak ilişkilidir ancak azalma eğilimi vardır. Sepsis olmayan hastalarda günlük |
| Laupland ve ark. 2012 (21) | Nisan 2000 -Kasım 2010 Fransız YBÜ kabul edilen hastalar kohort çalışması; n = 10 962 | • Hastaların %25.7'sinde YBÜ başvuruda ≥ 38.3 °C ateş vardı. • Ateş mortalite artışı ile ilişkili değildi, ancak hipotermi tıbbi hastalarda ölümün bağımsız bir öngördürücüsüydü. |
| Genç ve ark. 2012 (22) | 2005-2009 Avustralya, Yeni Zelanda ve İngiltere'de YBÜ kabul hastalar retrospektif kohort çalışması n = 636.051 | • YBÜ'de ilk 24 saatte yükselen ateş, enfeksiyonu olmayan hastalarda ölüm riskinin artması ve enfeksiyonlu hastalarda ölüm riskinin azalmasıyla ilişkilendirildi. |
| Niven ve ark. 2012 (14) | 2004-2009 Calgary*'deki YBÜ kümülatif ateş insidansının kesintiye uğramış analizi n = 17.153 hastada 18.989 YBÜ yatış | • YBÜ kabul sırasında ≥ 38.3 ateşin kümülatif insidansı**, çalışmanın 5.5 yılı boyunca %50,1'den %25,5'e düşmüştür. |

GA: güven aralığı; YBÜ: Yoğun bakım ünitesi; NSAİİ'ler: steroid olmayan antienflamatuar ilaçlar.
*Kanada'nın 4. ve Alberta eyaletinin en büyük kentidir. Şehir, dünyanın en zengin bölgelerinden biridir.
**Kümülatif ateş insidansı: Belli bir zaman periyodu içinde hastalığa veya bir olaya maruz kalan kişi sayısının aynı zaman periyodunun başında risk altında olup hastalık veya olayı göstermeyen kişilerin sayısına bölümüdür (23).

olmalıdır. Ateşin bulaşıcı olmayan nedenlerinin ayırıcı tanı sürecine dahil edilmesi gerekir (24).

Tedavinin temel taşı, ateşin altında yatan nedeni tedavi etmektir. Klinisyenin antibiyotik tedavisine, kateterin çıkarılmasına ve/veya ateş tedavisinin endike olup olmadığına karar vermesi gerekebilir.

Postoperatif ateşi değerlendirirken, yardımcı bir anımsatıcı "dört W" dir:

• Wind (rüzgar) pulmoner nedenler: pnömoni, aspirasyon ve pulmoner emboli, ancak atelektazi değil,

• Water (su) idrar yolu enfeksiyonu,

• Wound (yara) ameliyat yeri enfeksiyonu,

• What did we do? (ne yaptık? iyatrojenik nedenler: ilaç ateşi, kan ürünü reaksiyonu, intravenöz hatlarla ilgili enfeksiyonlar) (25).

Bugün de geçerliliğini koruyan bu tanıma göre üç haftadan uzun süren, 38,3°C'nin üzerinde seyreden ve bir haftalık hastanede yapılan incelemeler sonucunda nedeni açıklanamayan ateş olarak tanımlanmıştır. Alıravcı ve ark yaptıkları bir çalışmada enfeksiyon hastalıklarına yatışı yapılan 230 hastanın 19'u nedeni bilinmeyen ateş tanısı ile yatırılmış. Bu olguların çoğunun enefeksiyon kaynaklı olduğu ve çok az kısmının gerçek nedeni bilinmeyen ateş kesin tanısı aldığı belirtilmiştir. Ateşli hasta grubunda etiyoloji belli olmadan antibiyotik kullanımının çok yaygın olduğu sonucuna varılmıştır (26).

Nedeni bilinmeyen ateşde (Tablo 2); vakaların %16 ila %39'unda tanı yoktur. Ateş, kafa travmalarından sonra iyileşme sırasında yaygındır. Ateş, güçlü bir serebral vazodilatördür ve intrakranial basıncı (İKB) yükseltebilir. Deneysel çalışmalarda, orta derecede hipertermi (39°C), yaralanmalardan sonra daha ciddi beyin hasarı ile sonuçlanmıştır. Orta derecede hipoterminin ise koruyucu olduğu belirtilmiştir. Jones ve ark ateş ile kötü

**Tablo 2:** Nedeni Bilinmeyen Ateş Etiyolojisi (27).

| | Bulaşıcı | İnflamatuar | Malignite | Çeşitli |
|---|---|---|---|---|
| Bölgesel | Genelleştirilmiş | | | |
| Apse | Bakteriyel | | | |
| Karın içi | Tifo ateşi | | | |
| Pelvik | Bartonelloz | Still hastalığı | Lenfoma | İlaç kaynaklı ateş |
| Böbrek | Bruselloz | | | |
| Diş, kafa içi | Q ateşi | | | |
| Endokardit* | Viral: HIV CMV EBV Castleman hastalığı | Dev hücreli arterit Polimiyalji Temporal arterit | Lösemi | İBH |
| Enfekte periferik damarlar | Mantar: Histoplazmoz Blastomikoz Kriptokokoz Koksidiyomikoz | Diğer vaskülitler: PAN Takayasu arteriti Polianjit Granülomatozis Miks kriyoglobulinemi | MDS | Sarkoidoz |
| Osteomiyelit | Mikobakteriyel Tüberküloz (ekstrapulmoner) | Diğer romatolojik bozukluklar SLE RA | Katı tümörler RCC HCC Metastaz | Pulmoner emboli/ derin ven trombozu |
| İYE | Parazitik: Sıtma, Toksoplazmoz Viseral amip apsesi Leishmaniosis, | | | Alkolik hepatit |
| Sinüzit | | | | FMF |
| Clostridium difficile koliti | | | | Yapay ateş |

* Subakut ve kültür negatif dahil, IYE: Idrar yolu enfeksiyonu, CMV: Sitomegalovirüs, EBV: Epstein-Barr virüsü, PAN:Poliarteritis nodosa, SLE:Sistemik lupus eritematöz, RA:Romatoid artrit, FMF:Ailesel Akdeniz ateşi, RCC:Renal hücreli karsinom, HCC:Hepatosellüler karsinom, İBH:İnflamatuar barsak hastalığı, MDS:Miyelodisplastik sendrom

prognostik nörolojik sonuç arasında anlamlı bir ilişki bulmuşlardır (28). Sıcaklığı düşürme yöntemleri arasında harici soğutma, intravasküler soğutma cihazları ve ateş düşürücüler kullanılabilir.

Yoğun bakımda kritik hasta takibinde uygun vücut ısısı ölçümüne, tanısal değerlendirmeye, kalıcı kateterlerin değiştirilmesine, ateş düşürücü ilaçların uygulanmasına ve antibiyotik tedavide değişikliğe dikkat edilerek ateşin tanımlanması ve tedavisine yönelik en iyi kanıta dayalı yaklaşımın literatür analizi yoluyla belirlenmesine ihtiyaç vardır (29).

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# Kist Hidatik Hastalığınının İntratorasik ve Pulmoner Tutulumları

Intrathoracic and Pulmonary Involvements of Hydatid Cyst Disease

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**ABSTRACT**

*Hydatid cyst is a zoonotic disease causing mortality and morbidity, and is endemic in Turkey. The causative agent of the disease is Echinococcus species. Although the liver is the primary organ involved, it can sometimes cause very different organ involvements. Pulmonary and intrathoracic involvements are also among these atypical presentations. In this short review, we aimed to review the literature and raise awareness in terms of intrathoracic and pulmonary hydatid cysts.*

**ÖZET**

*Kist hidatik ülkemizde endemik olarak görülen, mortalite ve morbiditeye sebep olan, zoonotik bir hastalıktır. Hastalık etkeni Echinococcus türleridir. KH'in primer olarak tutulum yaptığı organ karaciğer olmakla beraber, bazen çok farklı organ tutulumlarına da neden olabilir. Pulmoner ve intratorasik tutulumlar da bu atipik prezantasyonlardandır. Bu kısa derleme çalışmasında, intratorasik ve pulmoner kist hidatik yerleşimleri açısından literatürün gözden geçirilmesini ve farkındalık oluşturmayı amaçladık.*

## GİRİŞ

Kist hidatik (KH) hastalığı Echinococcus cinsi helmintler tarafından oluşturulan ve özellikle gelişmekte olan ülkelerde halk sağlığı problemi yaratan paraziter bir hastalıktır. Taksonomisi; aile Taeniidae, sınıf sestod (cestoda) şeklindedir. İnsan ve hayvanlarda hastalık yapar. Ekinokokların dört farklı türünün insanlarda hastalık oluşturduğu tespit edilmiştir. İnsanlarda yaygın türlerlerden en sık görüleni Echinococcus granulosus'tur. Diğer türlerden E. multilocularis daha seyrek görülür. Nadir patojenler arasında ise E.vogeli ve E. oligarthropoli vardır (1–4). Ülkemizde Sağlık Bakanlığı tarafından 2005 yılında bildirimi zorunlu hastalıklar kapsamına alınmıştır. Ancak bildirimlerde düzenli bir bilgi akışı sağlanamamakta, bu nedenle tam insidansını ülkemiz için tahmin etmekte sorun yaşanmaktadır (3).

Göğüs hastalıklarından genel cerrahiye kadar pek çok branşta çalışan hekim KH'li hasta ile karşılaşmıştır ve tedavi veya takibinde yer almıştır. Akciğerde görülen pek çok hastalık ile benzer bulguları olabileceği için akciğer hastalıkları ayırıcı tanısında göz önüne alınması gereken tanılar arasında tüberkülozun yanısıra KH de yer almalıdır (4).

Biz de bu çalışmada KH hastalığının intratorasik ve pulmoner tutulumları ile ilgili literatürü gözden geçirmeyi ve bu konudaki farkındalığı arttırmayı amaçladık.

## EPİDEMİYOLOJİ

Ekinokokkozun prevelans ve insidansı coğrafi bölgelere göre anlamlı değişiklikler göstermektedir. Bu oran 1–500/100.000 arasında değişmektedir. Prevelansın yüksek olduğu bölgeler Afrika (Kuzeyi ve doğusu), Avustralya kıtası, Avrasya (Rus Federasyonu, Akdeniz'e komşu ülkeler ve Türki Cumhuriyetler) ile Güney Amerika olarak bildirilmiştir (4).

Hayvan insan bulaşı yolağında hayvanlar (ör: koyun, köpek, büyükbaş) önemli role sahiptir. İnsidansın yüksek olduğu topluluklar düşük eğitim ve sosyo ekonomik düzeye sahiptir. Ekinokokkoz ülkemizde özellikle Doğu Anadolu ve İç Anadolu bölgeleri ile kırsal kesimlerde ciddi bir halk sağlığı problemidir (4). Sağlık Bakanlığı tarafından yayınlanan veriler göz önüne alındığında, 1955–2005 yılları arasında yaklaşık 50.000 KH vakası bildirilmiştir. Yıllık olarak 2500 civarı yeni vaka bu değerlere eklenmektedir. Türkiye'deki insidansı %0.8-11 arasında bildirilmiştir (5,6). Hayvancılıkla uğraşan insanlarda daha sıktır ve kadınlarda erkeklere göre daha sıktır (2,4). Ancak Balcı ve ark. (7) 728 KH ile ülkemizden ulaşılabilen en büyük olgu sayısını bildirmiştir. Bu çalışmada; erkek/kadın oranı: 2.1; yaş ortalaması 29.2 ± 5.6 yıl (5 ay–71 yıl) idi. Bu çalışmada, kadınlarda daha sık bildirilmesinin sebebi, o bölgede kadınların daha sık olarak hayvancılıkla uğraşmaları olabilir (7).

## KİST HİDATİK HASTALIĞININ KLASİK VE TORASİK-PULMONER TUTULUMLARI

Kist hidatik tüm dokuları tutabilme potansiyeline sahip olmakla birlikte, %60–80 oranında karaciğeri, %10–30 oranında akciğerleri tutar. Ancak hematojen yolla da yayılma ihtimali nedeniyle birçok farklı organı etkileyebileceği unutulmamalıdır (1–3,7). Öztürk-Durmaz ve ark. (3) KH olgularının dağılımlarını araştırdıkları çalışmalarında 103 hastanın %1.9'sinde akciğer tutulumu olduğunu bildirmiştir. Balcı ve ark. (7) ise, KH olgularının %6.73'ünde eş zamanlı karaciğer ve akciğer tutulumu bildirmiştir.

Klasik bilgi olarak akciğer, karaciğerden sonra en sık etkilenen ikinci organdır (1,2). Torasik KH hastalığı ise nadirdir ve plevra, mediasten içi, kalp, diyafram ve göğüs duvarı tutulabilir (1–3). Vakaların sadece %0.9–2'sinde göğüs duvarı, kaburgalar ve sternumda ortaya çıktığı bildirilmiştir. Tüm KH tutulumları arasında intratorasik ekstrapulmoner tutulumun sıklığının %7.4 civarında olduğu bildirilmiştir (2).

Plevral hidatidozun en sık nedeni, sağ üst hepatik lobda yer alan kistlerin rüptürü ile trans-diyafragmatik geçiş olmasıdır (8). Erişkinlerde karaciğer tutulumu daha sıktır. Çocukluk çağında ise erişkinlerden farklı olarak, en sık akciğerleri tutar. Erişkinlere göre doku elastisitesinin daha çok olmasından dolayı çocuklarda dev boyutlu KH görülme insidansı daha yüksektir (9,10).

### KLİNİK BULGULAR

Torasik-pulmoner KH birçok farklı klinik sunumla gelebilir (11). Klinik bulgular ve semptomlar kistin lokalizasyonuna ve organlardaki kompresyon derecesine bağlı olarak değişkenlik gösterir (12,13). Çoğu hasta asemptomatik olmasına rağmen, bazı olgularda çevre dokulara basıya bağlı semptomlar görülebilir veya bazı olgular kist içeriğini ekspektore edebilir (7,8,14,15).

Her hastaya ameliyat öncesi tanı konulamaz, ameliyat ile tanı konulan hastalar da vardır. Ayrıca komplike olmayan KH olguları asemptomatik olabilir, bu olguların %50'si asemptomatik seyrettiği için tanı alamaz. Çekilen akciğer grafilerinde insidental olarak tespit edilirler veya otopsi esnasında insidental olarak tanı konulur (7–14).

Klasik olarak pulmoner KH diğer akciğer hastalıklarından farklı şikayetlere neden olmaz (14,15). Bazen semptomlar, antijenik materyalin bronşta perforasyonundan ve kist rüptüründen gelişen sekonder immünolojik reaksiyonlardan kaynaklanabilir (16–19).

Hemoptizi, ateş yüksekliği, titreme, beyaz balgamlı prodüktif öksürük, bulantı- kusma, baş dönmesi ve halsizlik gibi şikayetlere neden olduğu bildirilmiştir (14,15). Pürülan balgam ve ateş yüksekliği ise sepsis ile sonuçlanabilecek durumlar olan pnömoni veya enfekte kistin güçlü göstergeleri olarak kabul edilmektedir (17–19). Balcı ver ark. (7) çalışmalarında KH olgularının en sık semptomunun yüksek ateş olduğunu bildirmiştir.

## KOMPLİKASYONLAR

Tek ve boyutu nedeniyle çevre organlara bası yapmayan KH'ler komplike hale gelmeyebilir. Ancak dev boyutlara ulaşan KH bası nedeni ile solunum sıkıntısına neden olabilir ve rüptür riski yüksektir. Sekonder enfeksiyonlar, komşu organ fistülizasyonu, hemotoraks, pnömotoraks, plevral efüzyon, ampiyem, rüptür nedenli alerjik reaksiyonlar gelişebilir (20–24). Akciğer KH'i olan hastaların %7.6'sında ampiyem geliştiği bildirilmektedir (21). Ayrıca karaciğerde yer alan KH de toraks kavitesi yönünde büyüyerek transdiyafragmatik yolla plevral aralığa rüptüre olabilir (14,15). Bazen de operasyon sırasında toraks kavitesine rüptür olup, hastalık komplike hale gelebilir (25,26).

Ameliyat sonrası komplikasyonlar ise atelektazi ve yara yeri enfeksiyonudur. Mortalitesi %1,5 iken morbidite %14,4 ve rekürrens oranı ise %2,5 olarak bildirilmiştir (27).

### TANI- AYIRICI TANI

Torasik- pulmoner KH tanısı, hastalar çok farklı klinik tablolarla prezente olabileceğinden atlanabilir. Bu hastalığın tanısında ayrıntılı anamnez, serolojik ve radyolojik tetkikler kullanılabilir (2,12). Ancak tanı her zaman ameliyat öncesinde konulamayabilir (12). Görüntülemede kistler karakteristik olarak tek veya çok sayıda sınırlı veya oval kitleler olarak görülebilir (28). Tanı akciğer grafileri veya bilgisayarlı tomografi ile konulur ve seroloji ile desteklenir (29).

Spesifik ekinokokal antijenlere karşı antikor (Ekinokok IHA) tespiti, pulmoner KH olan hastaların yaklaşık yarısında bulunur (28).

Ayırıcı tanıda pulmoner veya mediastinal her türlü hastalıkla karışabilir. Pnömoni, ampiyem, hatta mediastinal tümörler bile ayırıcı tanısına girmektedir (4, 29,30).

### TEDAVİ

Kist hidatiğe karşı oral mebendazol veya albendazol tedavilerinin etkilidir (1,2,30). Ancak, akciğer KH hastalığı olan hastalarda birincil tedavi yöntemi cerrahi olup, medikal tedavi ile beraber cerrahi uygulanmalıdır (4,31). Kist boyutu ne olursa olsun, olası komplikasyonları önlemek için tanı konulduktan sonra mümkün olan en kısa sürede ameliyat yapılmalıdır (32,33).

Ayrıca intratorasik ekstrapulmoner destrüktif özellik gösteren KH olguları, kistotomi kapitonaj tekniğinden ziyade sistektomi, geniş rezeksiyon ve perikistik ve komşu dokuların rekonstrüksiyonundan oluşan tam bir cerrahi tedavi gerektirir (30).

### SONUÇ

Ülkemiz gibi hayvancılığın yaygın olduğu bölgelerde akciğer hastalıklarının ayırıcı tanısında mutlaka pulmoner KH düşünülmelidir ve hastalar cerrahi endikasyon açısından değerlendirilmelidir.

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# Tularemi Pnömoni Yapar mı?

Does Tularemia Cause Pneumonia?

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**ABSTRACT**
*Tularemia is a zoonotic disease that has recently come to the fore due to the increasing number of cases in our country. This disease is a disease that is known to cause lymphadenopathy in the neck, but can also cause different organ involvement and complaints. Pneumonic involvement is one of these involvements. In this review study, we aimed to search the relationship between tularemia and pneumonia in the light of the literature.*
**ÖZET**
*Tularemi ülkemizde artan vaka sayıları nedeniyle son dönemlerde gündeme gelmeye başlayan zoonotik bir hastalıktır. Bu hastalık öncelikle boyunda lenfadenopati yaptığı bilinen, ancak farklı organ tutulumları ve şikâyetlere de neden olabilen bir hastalıktır. Pnömonik tutulum da bu tutulumlardandır. Bu derleme çalışmasında; tularemi pnömoni ilişkisini literatür eşliğinde araştırmayı amaçladık.*

## GİRİŞ

*Francisella tularensis*, eklembacaklıların ısırıkları, hayvan leşlerinin işlenmesi, kontamine yiyecek-su tüketimi veya enfekte partiküllerin solunması dahil olmak üzere birçok yolla bulaşabilen tularemi olarak adlandırılan zoonotik bir enfeksiyon hastalığına sebep olur (1,2). Bu küçük gram-negatif kokobasillerin insan ve hayvanlarda hastalık yapabileceği bilinmektedir (2).

Tulareminin global olarak endemik olduğu bölgeler, Kuzey Yarım Kürede 30° ve 71° enlemleri arasında yer alan bölgelerdir. Amerika Birleşik Devletleri (ABD), Avrupa kıtasında İsveç ve Finlandiya'da endemik olarak görülmektedir. Yaz aylarında vektör (kene ve sivrisinek) ilişkili bulaşla ilişkili olgular artarken, kış aylarında da tavşan gibi yabani hayvan avcılığı ile ilişkili olgularda artış görülmektedir (3). Ülkemizde halk sağlığı problemi olan, tularemi ile ilgili ilk Marmara Bölgesi'nde vakalar bildirilmiş olup, Marmara Bölgesi salgınları ilerleyen yıllarda da devam etmiştir. İç Anadolu Bölgesi, Karadeniz Bölgesi ve Doğu Anadolu Bölgesi gibi farklı bölgelerden de gerek salgınlar, gerek vaka bildirimleri olmuştur (4-20). Türkiye Cumhuriyeti Sağlık Bakanlığı verilerine göre ise; 2008-2017 yılları arasında 6452 yeni tanı tularemi vakası bildirilmiştir (21).

Hastalık ağırlıklı tutulum bölgesine göre 6 farklı alt tipte görülür (ülseroglandüler, glandüler, oküloglandüler, orofaringeal, pnömonik ve tifoid). Dünyada en sık bildirilen tularemi formu; ülseroglandüler form iken, ülkemizde en sık orofaringeal formun görüldüğü bildirilmiştir (2,3, 22).

Bu derleme çalışmasında; tularemi pnömoni ilişkisini literatür eşliğinde derlemeyi amaçladık.

### Tularemide Pulmoner Tutulum

Tularemi genellikle, maruziyetten yaklaşık ortalama üç ile beş gün sonra (1- 21 gün arasında) ani veya hızlı başlangıçlı olarak ortaya çıkan ateş yüksekliği, titreme, anoreksi ve halsizlik gibi spesifik olmayan sistemik semptomlara neden olur. Klasik olarak, ateş birkaç gün sonra düşebilir, ancak daha sonra hızla geri döner. Diğer spesifik olmayan semptomlar arasında baş ağrısı, yorgunluk, göğüste veya kaslarda ağrı, karın ağrısı, kusma veya ishal bulunur. Bazı hastalarda, bu sistemik semptomlar değerlendirme zamanına kadar azalmış olabilir (2,22). Pnömoni, tularemide doğrudan inhalasyondan kaynaklanan birincil bir süreç olarak veya ülseroglandüler/tifoid hastalığının ikincil bir belirtisi olarak sekonder bakteriyemi ile plevral boşluğa F.tularencis'in yayılması sonucunda (sekonder plöro-pulmoner hastalık tablosu) ortaya çıkabilir (1,2,3,23,24). Bu klinik form, daha çok Kuzey Amerika'daki vakalarda bildirilmiştir. Daha yüksek mortaliteye (%30-60) neden olduğu bildirilmiştir (3).

Tularemik pnömoniyi diğer toplum kökenli pnömoni etkenlerinden ayırt ettiren spesifik semptom ve radyolojik bulgu yoktur. Tularemi pnömonisinin klinik ve radyolojik bulguları oldukça değişkendir. Bu zoonotik hastalık atipik pnömoniye neden olur (22,25). Tularemik pnömoninin radyolojik tutulumu, lober (tek veya iki taraflı), segmental, yamalı infiltrasyon gibi çok farklı şekillerde olabilir.

Çok nadir de olsa miliyer tutulum, kavite oluşumu veya pulmoner kistik yapılar gözlenebilir. Olguların yaklaşık yarısında hiler/mediyastinal lenfodenopati varlığı bildirilmiştir (3). Sıklıkla ateş yüksekliği, genel durum bozukluğu, hafif derecede non produktif (kuru) öksürük şikayetlerine neden olduğu bildirilmiştir. Bilateral tutulum özellikle bakteriyemik seyirli vakalara eşlik eder ve bu olgularda sıklıkla eşlik eden plevral efüzyon görülür. Karaciğer enzimlerinde hafif derecede yüksekliğe sebep olabilir (25).

**Literatürün Tularemi ve Pnömoni Birlikteliği Açısından Değerlendirilmesi**

Ulaşılabilen literatürde ilk tularemik pnömoni vakası 1945 yılında Beebe (26) tarafından bildirilmiştir. Ülkemizden de bildirilmiş olgular vardır (9,27,28,29). Karagöz ve ark (28), 2012 yılında bakteriyeminin eşlik ettiği iki pnömoni olgusu bildirmiştir. Diğer olgular ise 2019 yılında Gürbüz ve ark. (27) tarafından bildirilmiş olası orofaringeal tutulumu olan hastada akciğerlere mikroaspirasyonla geliştiği tahmin edilen olgu ile, 1999 yılında Helvacı ve ark (9) tarafından bildirilen orofaringeal tularemiyle birlikte görülen pnömoni olgularıdır. Sırmatel &Bucuk (29) 2020 yılında akciğer grafisinde hiler lenfadenomegali, lobular ve nodüler tutulum gösteren ve bronkoskopide kitle saptanan, radyolojik olarak akciğer kanseri düşünülürken, şikâyetlerinin patates tarlasında çalıştıktan sonra geliştiği fark edilen ve serolojik olarak tanı konan bir hastayı bildirmiştir. Beş olgu da tedaviyle tamamen düzelmiştir (9,27,28,29).

Tularemik pnömoninin spesifik semptom veya radyolojik görüntü bulgusu yoktur. Tularemik pnömoninin tanısında karşılaşılan en büyük engel, çok nadir görülmesi ve mikrobiyolojik tanısının zorluğudur (30).

Literatür incelendiğinde erişkinlerde çok farklı pulmoner tutulumlar olduğu saptanmıştır. Lober pnömoni (31), sadece kaviter pnömoni (32), kaviter pnömoniye eşlik eden ampiyem (33), plöropulmoner tularemi (34) ve akciğer absesi (35), nekrotizan mediastinal ve hiler lenf nodları olan tularemik pnömoni olguları bildirilmiştir (36). Sepsisin eşlik ettiği (37) hatta akut solunum sıkıntısı sendromu (ARDS) (38) geliştiği bildirilen olgular da mevcuttur. Tularemide pulmoner tutulum tek başına olabileceği gibi cilt tutulumunun eşlik ettiği olgular da bildirilmiştir (39). Çocuklarda da tularemik pnömoni olguları bildirilmiştir (40,41).

*F. tularensis* bakteriyemisi olan olguların %73'ünde altta yatan pnömoni olduğu ve çoğunun tifoid ve orofaringeal formda olduğu bildirilmiştir (28). Bu vakaların büyük çoğunluğu; yaşlılık, alkol kötüye kullanımı, şeker hastalığı, organ nakli veya bağışıklığın baskılanması gibi altta yatan hastalıkları olan olgulardır. Ayrıca, bildirilen vakaların çoğuna rabdomiyoliz, akut böbrek yetmezliği veya sepsis eşlik edebileceği bildirilmiştir (28).

**TANI**

Tularemi hastalığının kesin tanısı, *F. tularensis*'in mikrobiyolojik örneklerden izole edilmesiyle konulmaktadır. Ancak, *F. tularensis*'i üretmek için sülfidril bileşikleri (sistin, sistein, tiyosülfat gibi) içeren zenginleştirilmiş besiyerlerine gerek duyulmaktadır. Bu nedenlere bağlı olarak genellikle mikrobiyolojide rutin kullanılan besiyerlerinde üretilemez. Çok nadir olarak kanlı agar gibi genel kullanım besiyerlerinde üretilebilir (3). Tanı, klinik örneklerde polimeraz zincir reaksiyonu (PCR) ve serolojik incelemeleri içerir (30). Tularemi tanısında serolojik testlerin 1920'li yıllardan beri sıklıkla kullanıldığı bilinmektedir. Bu yöntemle hasta serumunda *F. tularensis*'e karşı gelişen antikorlar veya akut evrede ise antijenler aranabilir. Tüp veya mikro-pleytlerde yapılan aglütinasyon testlerinde *F. tularensis*'e karşı gelişen antikorların aranması uygulaması en kolay tanı yöntemidir. Bu yöntemler arasında, Mikroaglütinasyon testi (MAT) en sık kullanılan tanısal yöntemdir (3,22).

*F. tularensis* balgam, cilt ülseri, plevral sıvı ve lenf düğümlerinden kültürlenebilir, ancak laboratuvar personeline yönelik tehlike nedeniyle kültürler alınmamalıdır (42).

**AYIRICI TANI, KLİNİK BULGULAR**

Bronkoskopik incelemede elde edilen patolojik bulguların, tüberküloz veya sarkoidozdan ayırt edilemeyeceği bildirilmiştir (3). Ayrıca, tularemik pnömoni, fungal ve bakteriyel pnömonileri, tüberkülozu veya maligniteyi taklit edebilir. Atipik pnömoni ile başvuran, ülser ve/veya lenfadenopati bulgusu ve açık hava etkinliği öyküsü olan her hastada tularemik pnömoni tanısı düşünülmelidir (42). Pnömoni genellikle enfeksiyondan 2 gün ile aylar sonra ortaya çıkar. Primer tularemik pnömoni ve tifoid tularemiyi komplike eden pnömoninin ölüm oranı yüksektir (42).

**TEDAVİ**

Hastanın klinik tablosunun ağırlığına göre, tedavide verilecek antibiyotikler parenteral intramusküler veya oral yolla verilebilir. Parenteral yolla başlanan tedaviler, hastanın klinik durumuna göre, oral ardışık tedavi ile devam ettirilebilir. Siprofloksasin, doksisiklin ve kloramfenikol tedavide tercih edebilecek antibiyotiklerdendir. Çocuklarda streptomisin ve gentamisin ilk tercih edilen ajanlardır. Tedavi süresi 10-14 gündür. Bazı olgularda 21 güne kadar tedavi süresi uzatılabilir (3,22).

Tedavinin erken başlanması, daha başarılı klinik sonuçlarla ilişkilidir. Tedaviye geç başlanan olgularda, durumunda iyileşme süresinin uzadığı bildirilmiştir. Özellikle hastalığın ilk 2.-3. haftasından sonra, tedavi başlanan olgularda hastanın komplike hale geldiği, lenf bezlerinde süpürasyon geliştiği ve cerrahi müdahale gereksinimi arttığı bildirilmiştir. Tedavi süresi verilen antibiyotiğin özelliğine göre; bakterisidal antibiyotikler (gentamisin, streptomisin, siprofloksasin) için 10-14 gün, bakteriyostatik antibiyotikler (doksisiklin, kloramfenikol) için 14-21 gündür (42).

**SONUÇ**

Sonuç olarak, endemik bölgelerde yaşayanlarda gelişen ve özellikle antibiyotik tedavisine yanıtsız pnömonilerde, etyolojide tulareminin de düşünülmesi gerekir. Bu hastalarda orofarenks muayenesi ayrıntılı yapılmalı, özellikle orofaringeal tutulumu olan ve pnömoni saptanan hastalarda tularemik pnömoni ayrıcı tanıda akla gelmelidir.

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# Factors Affecting Evisceration Following Open Radical Cystectomy

### Açık Radikal Sistektomi Sonrası Eviserasyona Etki Eden Faktörler

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**ABSTRACT**

**Introduction:** To clarify predictive factors for evisceration after open radical cystectomy (ORC).

**Methods:** Charts for patients who underwent ORC between 2017 and 2021 were reviewed retrospectively. Patient demographic characteristics and operative outcomes were recorded. Patients who underwent ORC were divided into two groups as patients who developed evisceration (Group 1) and patients who did not develop evisceration (Group 2). The groups were compared according to patient preoperative characteristics, intraoperative parameters and postoperative outcomes.

**Results:** Total, 164 patients met study inclusion criteria, and 24 patients with evisceration and 140 patients without evisceration were enrolled into Group 1 and Group 2, respectively. In contrast, the presence of diabetes mellitus was significantly higher in eviscerated patients (25.0% and 5.7% p= 0.002), and eviscerated patients had significantly higher BMI (28.8 kg/m2 and 24.9 kg/m2, p= 0.001). Also, non-eviscerated patients had significantly higher preoperative albumin level (p= 0.001). Moreover, the operation time was significantly longer in patients with evisceration (332.5 min and 268.3 min, p= 0.001) and lymph node positivity was significantly higher in patients with evisceration (50.0% and 26.4%, p= 0.020). Multivariate regression analysis revealed that higher BMI, lower preoperative albumin level, and longer operation time were significantly associated with evisceration after ORC. Also, the presence of diabetes mellitus increased the risk of evisceration seven-fold following ORC.

**Conclusion:** Present study showed for the first time that higher BMI, lower preoperative albumin level, longer operation time and presence of diabetes mellitus were predictive factors for evisceration following ORC.

**ÖZET**

**Amaç:** Açık radikal sistektomiden (ORC) sonra eviserasyon için prediktif faktörleri netleştirmek.

**Gereç ve Yöntem:** 2017-2021 yılları arasında ORC uygulanan hastaların çizelgeleri geriye dönük olarak incelendi. Hastaların demografik özellikleri ve ameliyat sonuçları kaydedildi. ORC uygulanan hastalar eviserasyon gelişen hastalar (Grup 1) ve eviserasyon gelişmeyen hastalar (Grup 2) olarak iki gruba ayrıldı. Gruplar hasta preoperatif özellikleri, intraoperatif parametreler ve postoperatif sonuçlara göre karşılaştırıldı.

**Bulgular:** Toplam 164 hasta çalışmaya dahil edilme kriterlerini karşıladı ve eviserasyonlu 24 hasta ve eviserasyonsuz 140 hasta sırasıyla Grup 1 ve Grup 2'ye alındı. Buna karşılık, eviserasyon olan hastalarda diabetes mellitus varlığı anlamlı olarak daha yüksekti (%25.0 ve %5.7 p= 0.002) ve yine bu hastalarda VKİ anlamlı olarak daha yüksekti (28.8 kg/m2 ve 24.9 kg/m2, p= 0.001). Ayrıca evisere olmayan hastalarda preoperatif albümin düzeyi anlamlı olarak daha yüksekti (p= 0.001). Ayrıca eviserasyonlu hastalarda ameliyat süresi anlamlı olarak daha uzundu (332.5 dk ve 268.3 dk, p= 0.001) ve eviserasyonlu hastalarda lenf nodu pozitifliği anlamlı olarak daha yüksekti (%50.0 ve %26.4, p= 0.020). Çok değişkenli regresyon analizi, daha yüksek BMI, daha düşük preoperatif albümin seviyesi ve daha uzun operasyon süresinin ORC sonrası eviserasyon ile anlamlı şekilde ilişkili olduğunu ortaya koydu. Ayrıca, diabetes mellitus varlığı, ORC'yi takiben eviserasyon riskini yedi kat arttırdı.

**Sonuç:** Bu çalışma ilk kez daha yüksek BMI, daha düşük preoperatif albümin seviyesi, daha uzun operasyon süresi ve diabetes mellitus varlığının ORC sonrası eviserasyon için prediktif faktörler olduğunu göstermiştir.

## INTRODUCTION

Radical cystectomy (RC), including pelvic lymph-node dissection, is accepted as a standard surgical method for patients with non-metastatic muscle invasive bladder cancer and patients with non-muscle invasive bladder cancer which cannot be treated with endoscopic methods (1). Although RC can be performed as laparoscopic and robot-assisted surgery, open radical cystectomy (ORC) is widely performed due to the extended learning curve for laparoscopic RC, the high cost of robotic surgery and the difficulty of accessing the robotic system. Despite the improvements in preoperative assessment methods

and surgical techniques, ORC remains one of the most complex surgeries in urology practice (2). Previous studies showed that ORC involves some potential complications including acute renal failure, haemorrhage, lymphocele, wound infection and evisceration (3).

Evisceration following ORC is associated with prolonged hospital stay, additional healthcare costs, and requirements for additional surgical procedures. Also, the evisceration rate following ORC was reported to have a wide range in the literature due to the heterogeneous nature of bladder cancer characteristics, different patient demographic properties and different surgical techniques. Shiavina and colleagues investigated the short-term complications following ORC, and found evisceration in 15 (3.7%) of 404 patients (4). In another study by Cantiello and colleagues, they analysed the complications after ORC, and evisceration was found in 12.9% of the whole study population (5). However, these studies did not mention predictive factors for evisceration after ORC.

Although previous reports stated that evisceration was a serious complication following ORC, no study has investigated the risk factors for evisceration after ORC. In the present study, we aimed to clarify predictive factors for evisceration after ORC.

**MATERIAL AND METHOD**

Charts for patients who underwent ORC including pelvic lymph-node dissection between January 2017 and February 2021 were reviewed retrospectively. The study was planned in accordance with the Helsinki Declaration Principles and all patients signed informed consent before surgery. The study was approved by Ethical Board (Meeting Decision No. 2020/172). Presence of non-metastatic muscle invasive bladder cancer or non-muscle invasive bladder cancer which could not be treated with endoscopic methods were accepted as indications for ORC. The urinary diversion type (ileal loop, orthotopic neobladder, or ureterocutaneostomy) was chosen according to the joint decision of the patient and the doctor. Patients who underwent laparoscopic RC, patients with missing data, patients who underwent salvage RC, and patients who underwent urethrectomy during ORC were excluded from the study. Also, other exclusion criteria were; being younger than 18 years old, presence of muscle and soft tissue disease, history of open abdominal surgery, and history of radical prostatectomy in men and history of hysterectomy and/or oophorectomy in women.

Patient demographic characteristics including, sex, age (years), presence of comorbidities, American Society of Anesthesiology (ASA) score, body mass index (BMI), and preoperative haemoglobin level (g/dL), creatinine level (g/dL) and albumin level (g/dL) were recorded. Also, transfusion requirements, operation time of procedure (minutes), type of diversion, final pathology of cystectomy, and positivity of lymph nodes were noted.

All patients were evaluated with complete blood count, serum biochemistry profile, coagulation profile, electrocardiography, contrast enhanced abdominal and chest computer tomography before surgery. Bowel preparation was done only one day before surgery and elastic compressive stockings were used on the day of surgery. Additionally, use of low molecular-weight heparin

was started on day of ORC and continued for at least 4 weeks after operation. All procedures were performed under general anaesthesia and antibiotic prophylaxis was administered with a combination of intravenous metronidazole and third-generation cephalosporin. ORC with extended pelvic lymphadenectomy was performed in accordance with the International Consultation on Bladder Cancer recommendations. In men, ORC included the removal of the bladder, seminal vesicles, prostate, and distal ureters, and in women the operation included the "en-bloc" removal of the adnexa, bladder, anterior and posterior vaginal wall, and urethra (except in cases of orthotopic neobladder). Extended lymph node dissection included obturator fossa, internal iliac, presacral, and external iliac nodes. The nasogastric tube was removed on the first day of the operation and the patients began to be fed orally. All ureterocutaneous or ureterointestinal anastomoses were stented for at least two weeks.

Patients who underwent ORC were divided into two groups as patients who developed evisceration (Group 1) and patients who did not develop evisceration (Group 2). The groups were compared according to patient preoperative characteristics, intraoperative parameters and postoperative outcomes. Moreover, multivariate regression analysis was used to clarify predictive factors for evisceration following ORC.

**Statistical Analysis**

Statistical analysis was done with the Statistical Package for the Social Sciences version 25 (SPSS IBM Corp., Armonk, NY, USA). Normality of the distribution of variables was evaluated by Shapiro-Wilk test and Q-Q plots. The Student-t test was chosen for comparison of normally distributed variables, and non-normally distributed values were evaluated with Mann Whitney u test. Quantitative data are expressed as mean ± standard deviation values. Categorical variables were classified and analysed using the $\chi 2$ test or Fisher's exact test. Binary logistic regression analysis was used to evaluate risk factors for the occurrence of evisceration. The data were analysed at 95% confidence level and p values of less than 0.05 were accepted as statistically significant.

**RESULTS**

At the end of the evaluation, 164 patients met study inclusion criteria, and 24 patients with evisceration and 140 patients without evisceration were enrolled into Group 1 and Group 2, respectively. The mean age of the study population was 63.8 years old and 89.6% of patients were male. The mean BMI was 25.5 kg/m2 and the mean pre-operative albumin level was 3.7 g/dL. The mean operation time was 277.7 minutes and transfusion was required in 74 (45.1%) patients. Ileal loop was the most preferred urinary diversion type with 130 (79.3%) cases, and lymph node positivity was detected in 49 (29.9%) patients. Preoperative, operative and postoperative parameters of the entire study population are summarized in Table 1.

Comparison of eviscerated and non-eviscerated patients revealed that sex, age, presence of hypertension, coronary artery disease and, chronic obstructive pulmonary disease, preoperative haemoglobin level, haemoglobin decrease, and preoperative albumin level were similar between the groups (p= 0.724, p= 0.860, p= 0.625, p= 0.485,

**Table 1:** Demographic data and postoperative results of all patients

|  | n:164 |
|---|---|
| Sex | |
|     Female | 17 (10.4%) |
|     Male | 147 (89.6%) |
| Age (Years)* | 63.8±8.4 |
| Presence of Diabetes Mellitus | 14 (8.5%) |
| Presence of Hypertension | 62 (37.8%) |
| Presence of Coronary Artery Disease | 58 (35.4%) |
| Presence of Chronic Obstructive Pulmonary Disease | 16 (9.8%) |
| ASA Score* | 1.7±0.7 |
| Body Mass Index* | 25.5±5.0 |
| Pre-operative Hemoglobin (g/dl)* | 12.8±2.1 |
| Hemoglobin Decrease (g/dl)* | 2.4±1.4 |
| Pre-operative Creatine (g/dl)* | 1.1±1.2 |
| Pre-operative Albumin (g/dl)* | 3.7±0.6 |
| Operation Time (minute)* | 277.7±72.7 |
| Diversion type | |
|     İleal loop | 130 (79.3%) |
|     Orthotopic neobladder | 27 (16.5%) |
|     Ureterocutaneostomy | 7 (4.2%) |
| Post-operative intensive care unit | 26.8±19.6 |
| Pathology of Cystectomy | |
|     pT0-pT1-pT2 | 104 (63.4%) |
|     pT3-pT4 | 60 (36.6%) |
| Lymph node positivity | 49 (29.9%) |
| Transfusion requirement | 74 (45.1%) |

*mean ± standard deviation, ASA: American society of anesthesiologists

p=0.708, p= 0.721, p= 0.767 and p= 0.593, respectively). In addition, pathology of cystectomy and diversion type were comparable (p= 0.720 and p= 0.745). In contrast, the presence of diabetes mellitus was significantly higher in eviscerated patients (25.0% and 5.7% p= 0.002), and eviscerated patients had significantly higher BMI (28.8 kg/m2 and 24.9 kg/m2, p= 0.001). Also, non-eviscerated patients had significantly higher preoperative albumin level (p= 0.001). Moreover, the operation time was significantly longer in patients with evisceration (332.5 min and 268.3 min, p= 0.001) and lymph node positivity was significantly higher in patients with evisceration (50.0% and 26.4%, p= 0.020).

Multivariate regression analysis revealed that higher BMI, lower preoperative albumin level, and longer operation time were significantly associated with evisceration after ORC. Also, the presence of diabetes mellitus increased the risk of evisceration seven-fold following ORC. Conversely, the present study showed that lymph node positivity did not have a significant effect on evisceration.

**DISCUSSION**

Radical cystectomy with pelvic lymph node dissection is a well-known and complex surgical procedure with serious potential complications. Although many studies reported complication types and complication rates following ORC, most of these studies did not focus on clarifying possible risk factors for complication development (3, 4, 5). We believe that identifying predictive factors for complications is an important step to prevent and manage complications. Thus, in the present study, we aimed to clarify risk factors for evisceration following ORC. Our study revealed that higher BMI, lower preoperative albumin level, longer operation time and presence of diabetes mellitus were predictive factors for evisceration after ORC.

The relationship between diabetes mellitus and tissue healing is a hot topic in medicine. Greenhalgh stated that coexistence of atherosclerosis and neuropathy in diabetes mellitus patients is a reason for poor tissue healing (6). Mahey and colleagues investigated the predictive factors for abdominal evisceration in 50 patients, and the authors claimed that presence of diabetes mellitus was a risk factor for abdominal evisceration (7). In parallel, we found diabetes mellitus was a predictive factor for evisceration following ORC. However, we did not evaluate fasting glucose levels in the present study, which could be examined in further studies.

Obesity results in increased abdominal pressure which could reduce abdominal wall blood flow and tissue healing. Pavlidis and colleagues compared 178 patients with and without evisceration in 1:1 ratio, and found that obesity was significantly common in patients with evisceration (8). In another study, Spiliotis et al. analysed the demographic characteristics of patients with abdominal wound dehiscence, and the authors stated that one of third patients with abdominal dehiscence had BMI ≥35 kg/m2 (9). In the present study, evisceration was significantly common after ORC in obese patients. Also, we believe that effect of waist circumference on evisceration following ORC may be the subject of another study.

Albumin is a serum protein with several important functions including maintaining osmotic pressure of the blood, and transporting hormones, drugs, and other substances such as calcium throughout the organs. Previous reports which investigated the importance of albumin level and tissue healing had controversial results. Riou and colleagues found that serum albumin level was 2.3 g/dL and 3.6 g/dL in patients with and without wound dehiscence, and stated that lower serum albumin level was a predictive factor for wound dehiscence (10). On the other hand, Kenig et al. claimed that serum albumin level had no significant effect on evisceration. However, surgery was performed in emergency situations for 80% of cases in Kenig's study and the authors did not mention the rate of oncologic cases (11). In the present study, lower serum albumin level was a predictive factor for evisceration following ORC.

Longer operation time could reflect the surgical difficulty. Prolonged contact of the intestines with air during open surgeries may cause the intestines to lose heat, decrease bowel movements, subileus or ileus. Buchs and colleagues investigated the risk factors for poor wound healing in patients with colorectal surgery, and found that operation time longer than three hours was a predictive factor for poor wound healing (12). Also, Alves et al. showed

**Table 2:** Comparison of patient demographic data and postoperative results between groups

|  | Eviscreated N:24 | Non eviscreated N:140 | P value |
|---|---|---|---|
| **Sex** |  |  |  |
| **Female** | 2 (8.3%) | 15 (10.7%) | 0.724 |
| **Male** | 22 (91.7%) | 125 (89.3%) |  |
| **Age (Years)*** | 63.5±8.0 | 63.8±8.5 | 0.860 |
| **Presence of Diabetes Mellitus** | 6 (25.0%) | 8 (57.1%) | 0.002 |
| **Presence of Hypertension** | 8 (33.3%) | 54 (38.6%) | 0.625 |
| **Presence of Coronary Artery Disease** | 10 (41.7%) | 48 (34.3%) | 0.485 |
| **Presence of Chronic Obstructive Pulmonary Disease** | 3 (12.5%) | 13 (9.3%) | 0.708 |
| **ASA Score*** | 1.9±0.9 | 1.7±0.7 | 0.248 |
| **Body Mass Index*** | 28.8±4.2 | 24.9±4.9 | 0.001 |
| **Pre-operative Hemoglobin (g/dl)*** | 12.8±2.5 | 12.9±2.0 | 0.721 |
| **Hemoglobin Decrease (g/dl)*** | 2.4±1.4 | 2.4±1.4 | 0.767 |
| **Pre-operative Creatine (g/dl)*** | 1.0±0.4 | 1.2±1.3 | 0.593 |
| **Pre-operative Albumin (g/dl)*** | 3.1±0.6 | 3.7±0.6 | 0.001 |
| **Operation Time (minute)*** | 332.5±80.1 | 268.3±67.3 | 0.001 |
| **Diversion type** |  |  |  |
| **Ileal loop** | 18 (75.0%) | 112 (80.0%) | 0.745 |
| **Orthotopic neobladder** | 4 (16.7%) | 23 (16.4%) |  |
| **Ureterocutaneostomy** | 2 (8.3%) | 5 (3.6%) |  |
| **Post-operative intensive care unit** | 28.0±19.6 | 26.6±19.7 | 0.747 |
| **Pathology of Cystectomy** |  |  |  |
| **pT0-pT1-pT2** | 16 (66.7%) | 88 (62.9%) | 0.720 |
| **pT3-pT4** | 8 (33.3%) | 52 (37.1%) |  |
| **Lymph node positivity** | 12 (50.0%) | 37 (26.4%) | 0.020 |
| **Transfusion requirement** | 9 (37.5%) | 65 (46.4%) | 0.417 |

*mean ± standard deviation, ASA: American Society of Anesthesiologists

**Table 3:** Multivariate analysis of evisceration risk factors

|  | Odds ratio | %95 CI | P value |
|---|---|---|---|
| **Presence of Diabetes Mellitus** | 7.438 | 1.535-36.036 | 0.013 |
| **Body Mass Index** | 0.861 | 0.748-0.992 | 0.038 |
| **Pre-operative Albumin** | 3.991 | 1.575-10.114 | 0.004 |
| **Operation Time** | 0.992 | 0.985-0.999 | 0.036 |
| **Lymph node positivity** | 2.153 | 0.706-6.564 | 0.178 |

the relationship between longer operation time and evisceration (13). In accordance with the aforementioned studies, longer operation time was a predictive factor for abdominal dehiscence following ORC.

The retrospective nature is considered to be a limitation of the study. However, all patient data were recorded in the electronic database system in a prospective manner. Secondly, we are aware of the limited number of patients in our study. In addition, due to working in a university, operations were performed by different surgeons in the same team, which may have affected intraoperative and/or postoperative outcomes; however, all surgeons had completed their learning curves and performed surgeries with the same technique. Also, the effect of evisceration on patient quality of life and mental health were not evaluated in the present study. Lastly, we did not focus on the cost of evisceration following ORC, which may be the subject of another study.

**In conclusion,** our study showed for the first time that higher BMI, lower preoperative albumin level, and longer operation time were predictive factors for evisceration following ORC. Additionally, presence of diabetes mellitus was significantly related with evisceration after ORC. Our study findings should be confirmed with randomised clinical research with higher patient numbers and prospective manner.

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# ORIGINAL ARTICLE

# Autism Spectrum Disorder: Why is It Underdiagnosed in Primary Care?

Otizm Spektrum Bozukluğu: Birinci Basamakta Neden Az Tanı Almaktadır?

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**ABSTRACT**
**Introduction:** *When Autism Spectrum Disorder (ASD) is diagnosed early, successful results can be obtained with various therapies. The study was carried out to determine the knowledge and awareness of family physicians in primary health care institutions about ASD.*
**Material and Methods:** *In this descriptive cross-sectional study, 196 family physicians working in the city of Kütahya were reached between July 2021 and December 2022. A 38-item questionnaire consisting of demographic characteristics and "Knowledge on childhood autism in healthcare workers (KCAHW) questionnaire" was administered to volunteers.*
**Results:** *Of the 151 family physicians (FPs) in the study, 81.5% were general practitioners, 17.9% were FP specialists and 0.7% were other medical field specialists. Although 86.8% of the participants had received training on autism, 64.9% were determined to feel inadequate. The KCAHW score and awareness of those who followed patients with ASD, those who received theoretical training, women, and newer FPs in the profession were higher, but the awareness of only young FPs was statistically significant (p<0,05).*
**Conclusions:** *It was determined that FPs in primary care, the first meeting place for sick and healthy babies and children with health workers, have a lack of information about ASD; thus, they do not feel adequate.*

**ÖZET**
**Amaç:** *Otizm Spektrum Bozukluğu (OSB) erken teşhis edildiğinde çeşitli tedavilerle başarılı sonuçlar alınabildiği bilinmektedir. Birinci basamak sağlık kuruluşlarında çalışan hekimlerin OSB'na ilişkin bilgi ve farkındalıklarını saptamak amacıyla gerçekleştirildi.*
**Gereç ve Yöntemler:** *Tanımlayıcı kesitsel tipteki bu çalışmada, Kütahya'da görev yapmakta olan 196 Aile hekimine Temmuz 2021-Aralık 2022 tarihleri arasında ulaşılmış ve gönüllülük esasına dayalı olarak demografik özellikler ve "Sağlık çalışanlarında çocukluk çağı otizmine ilişkin bilgiler (KCAHW) anketi" nden oluşan 38 soruluk bir anket uygulanmıştır.*
**Bulgular:** *Çalışmaya katılan 151 Aile Hekiminin (FP) %81.5'i pratisyen hekim, %17.9'u Aile Hekimliği uzmanı ve %0.7'si diğer tıp alanı uzmanlarıdır. Katılımcıların %86,8'i otizm konusunda eğitim almış olmasına rağmen, %64,9'unun kendini yetersiz hissettiği belirlendi. OSB'li hastaları takip edenlerin, teorik eğitim alanların, kadınların ve mesleğe yeni başlayan FP'lerin KCAHW skoru ve farkındalıkları daha yüksekti, ancak sadece genç AP'lerin farkındalığı istatistiksel olarak anlamlıydı (p<0,05).*
**Sonuçlar:** *Hastaların, sağlıklı bebeklerin ve çocukların sağlık çalışanları ile ilk karşılaşma yeri olan birinci basamaktaki Aile Hekimlerinin OSB hakkında bilgi eksikliği olduğu, kendilerini yeterli hissetmediği saptandı.*

## INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental childhood disorder in which symptoms such as impaired communication, repetitive behaviours, delay in language development, insistence on sameness, and overreaction to auditory stimuli are prominent (1). The etiology of ASD has not been understood completely yet. It is thought that genetic, environmental and epigenetic factors play a role in its etiology (2-4). It was originally thought of as a variant of schizophrenia; however, it was revealed by Leo Kanner in 1943 to be a different disorder (5). In the 1980s, the American Psychiatric Association evaluated ASD under the title of Pervasive Developmental Disorders and reported some criteria for its diagnosis (6-8).

ASD's prevalence is increasing in parallel with the global increase in awareness. While its prevalence was 0.04% in the 1970s, it rose to 1-2% with the increase in awareness (1,9). It is stated that its prevalence is higher in developed countries and it is observed in one in every 59-68 children (10-12). Its increasing prevalence and the fact that there is still no effective treatment increase the importance of early diagnosis of ASD because in children with ASD, successful results can be obtained with early diagnosis and treatment by special education. In fact, early diagnosis and

treatment are considered to be among the most important prognostic factors of ASD. All healthcare professionals, especially pediatricians, child psychiatrists and FPs, have a role in the early diagnosis of ASD (13). Due to their position in primary care, the importance of FPs in the early detection and diagnosis of autism comes to the fore because when babies and children get sick, the first place of application is FPs. In addition, babies and children are regularly followed up by FPs when they are not sick. However, pediatricians and child psychiatrists mostly examine a baby and child in case of application for any reason. FPs can play an important role in diagnosing autism early, coordinating assessment and treatment, counselling parents and classroom teachers, and long-term monitoring of child's development. It is known that early diagnosis and rehabilitative factors lead to more success in treating this disease and reintegrating the individuals into society. In this study, it was aimed to investigate the education, ASD knowledge and awareness of FPs, who are actively involved in primary health care services, where infants and children first encounter the health system, and where healthy infants and children are followed up routinely.

## MATERIAL AND METHODS

### Study Design

Since 196 FPs in Kütahya constituted the population of this descriptive cross-sectional study and all FPs were planned to be included in the study, no sample was taken. Those who did not accept to participate in the study were not included in the study, and neither were those who filled in the form incompletely or incorrectly. The study was completed with 151 (81.6%) FPs who met the inclusion criteria. The survey was administered to FPs face-to-face or online, between September and November 2021.

Questionnaire and Evaluation

In our study, a questionnaire consisting of 38 questions involving a sociodemographic information form and the "Knowledge about childhood autism among health workers (KCAHW) questionnaire" was used to collect data. Developed by Bakare et al., it consists of 19 questions related to four areas of autism (14). The first area (A) consists of eight items and is about the deterioration in social interaction seen in children with autism. The second area (B) consists of a single item and deals with symptoms related to communication and language development. The third area (C) consists of four items showing obsessive and compulsive, repetitive and stereotypical symptoms observed in autism. The fourth area (D) consists of six items, questions whether autism is a neurodevelopmental disorder, examines possible comorbid conditions, and explores the ages at which it occurs. The possible total score that can be obtained from the questionnaire ranges from 0 to 19. Each item is answered as "yes", "no" or "I don't know". Correct answers are awarded 1 point, while other answers get 0 point. The last item questions the age of onset of autism and is scored zero for neonatal age or infancy and one for childhood. Maximum and minimum scores that can be obtained from KCAHW are 19 and 0 respectively. The average questionnaire score in the population to which the questionnaire was applied measures the level of knowledge about childhood autism in that sample. There is no cut-off value in the evaluation of

the scores obtained from the questionnaire; the higher the score, the higher the level of knowledge (14). The Turkish validity and reliability study of the scale was carried out by Özgür et al. Kuder–Richardson 21 (KR-21) shows the internal consistency of items in a scale and gives the same coefficient as Cronbach's alpha. In the study by Özgür et al., the KR-21 value was found to be 0.68 for the whole scale (15).

### Statistical Analysis

As well as descriptive statistical methods (mean, standard deviation, frequency), Chi-square test was used to compare categorical data of the study. Compliance of numerical data with normal distribution was evaluated with the Kolmogorow Smirnov test. Numerical data that met the parametric test conditions were evaluated with the t-test and one-way anova, whereas the numerical data that did not meet the conditions were evaluated with the Mann Whitney-U and Kruskal Wallis tests. Significance was evaluated at the $p<0.05$ level.

### Ethics Committee

Approval from the local ethics committee, dated 30.06.2021 and numbered 2021/11-27, permission from the institution where the study and informed consent from the participants would be conducted were obtained.

### RESULTS

Of the 151 FPs in the study; 82 (54.3%) were male, 123 (81.5%) were married, 123 (81.5%) were general practitioners, 27 (17.9%) were FP specialists, 1 (81.5%) 0.7) was an expert in another field. Their age was 41.87±9.70 years, their professional time was 7.95±4.651 years, and time in the current Family Medicine Unit (FMU) was 5.69±4.284 years. FMU registered population was 2903.44±857.60 and the number of daily examinations was 54.03±19.28. The number of participants with children was 114 (75.5%) (number of children: 1.65±0.70). Sociodemographic characteristics and other information are given in Table 1.

Of the participants, 131 (86.8%) received training on autism; 42 (27.8%) during medical education, 9 (6.0%) during specialization training and 99 (65.6%) during in-service training related to ASD. Of the participants, 28 (21.5%) received their last training on ASD less than two years ago, 84 (64.7%) between 2-5 years ago and 18 (13.8%) more than five years ago. Of the participants, 62 (41.1%) completed their child psychiatry internship. While 12 (7.9%) of the participants had acquaintances with autism, 52 (34.4%) followed up patients with autism. Of the participants, 53 (35.1%) thought that they were self-sufficient in autism (Table 2).

Participants got 7.08±1.20 points from the first area (Area A) of the scale which questions the awareness of the deterioration in social interaction seen in children with autism, 0.92±0.27 from the second area (Area B) consisting of a single item questioning awareness of symptoms related to communication and language development, 2.78±0.93 from the third area (Area C) questioning the awareness of obsessive and compulsive, repetitive and stereotypical symptoms observed in autism, 3.25±1.31 from the fourth area (Area D) which questions whether autism is a neurodevelopmental disorder, and 14.03±2.39 points from the whole scale (Table 3).

**Table 1:** Sociodemographic and professional characteristics of family physicians (n=151)

| Characteristics | Mean | SD |
|---|---|---|
| Age | 41.87 | 9.70 |
| Duration of Being a Family Physician | 7.95 | 4.65 |
| Time in the current Family Medicine Unit (FMU) | 5.69 | 4.28 |
| Number of Patients Examined Daily | 54.03 | 19.28 |
| | n | % |
| Sex | | |
|     Female | 69 | 45.7 |
|     Male | 82 | 54.3 |
| Marital Status | | |
|     Single | 28 | 18.5 |
|     Married | 123 | 81.5 |
| Status of Receiving Specialization Training | | |
|     General Practitioner | 123 | 81.5 |
|     Family Physician Specialist | 27 | 17.9 |
|     Specialist in Other Medical Fields | 1 | 0.7 |
| Total | 151 | 100.0 |

**Table 2:** Educational characteristics of family physicians about Autism Spectrum Disorder (ASD).

| Characteristics | n | % |
|---|---|---|
| Status of receiving training about ASD | | |
|     Received | 131 | 86.8 |
|     Not received | 20 | 13.2 |
| Time since last training | | |
|     Less than 2 years | 28 | 21.5 |
|     Between 2-5 years | 84 | 64.7 |
|     More than 5 years | 18 | 13.8 |
| Child Psychiatry Internship status | | |
|     Yes | 62 | 41.1 |
|     No | 89 | 58.9 |
| Considering oneself adequate for ASD | | |
|     Adequate | 53 | 35.1 |
|     Not adequate | 98 | 64.9 |
| Total | 151 | 100.0 |

**Table 3:** Knowledge about childhood autism among health workers (KCAHW) questionnaire area scores and total scale score (n=151)

| Scale Area Score | Min-max | Mean±SD | %95 CI |
|---|---|---|---|
| Score of Area A | 1-8 | 7.08±1.20 | 6.87-7.26 |
| Score of Area B | 0-1 | 0.92±0.27 | 0.87-0.96 |
| Score of Area C | 0-4 | 2.78±0.93 | 2.63-2.94 |
| Score of Area D | 0-6 | 3.25±1.31 | 3.03-3.46 |
| Total Scale Score | 7-19 | 14.03±2.39 | 13.62-14.45 |

The questions numbered A2 (n=150, 99.3%), A1 (n=146, 96.7%) and A7 (n=145, 96.0%) in the scale were the questions answered correctly by the participants at the highest rate, while C2 (n=50, 33.1%), D5 (n=52, 34.4%) and D6 (n=65, 43.0%) were those that the participants answered correctly at the lowest rate (Table 4).

It was determined that there was no statistical difference between the gender, training about ASD, occupational years, follow-up of patients with ASD and the level of ASD knowledge of the FPs participating in the study (p>0.05). It was determined that the ASD knowledge level of FPs aged 25-39 years (KCAHW score:14.49±2.19) was significantly higher than those aged 40 and over (KCAHW score:13.65±2.48) (p=0,032) (Table 5).

**DISCUSSION**

ASD is a disorder with a high probability of treatment with early diagnosis, appropriate behaviour and psychological approaches. All healthcare professionals have a role in the early diagnosis of ASD. Zwaigenbaum et al. emphasize that FPs and pediatricians play a major role in diagnosing ASD (9). The role of primary health care workers, who encounter individuals with ASD most frequently after their parents, is also important. In Turkey, primary health care services have been carried out with the family medicine system since 2005. Family health workers and FPs work in family health units. Keklik et al. found the mean knowledge level for ASD to be 12.29±3.19 in their study on nurses (16). In our study, the mean score of FPs working in primary care was higher (14.03±2.38). Comparison of the two studies shows that the knowledge level of FPs is higher than that of nurses. New approaches and early diagnosis tests have been developed for early and accurate diagnosis of ASD (17-20). Although some of the children with ASD are diagnosed with these tests, it has been observed that there may be those with ASD who have a normal test result but subsequently develop ASD or whose diagnosis can be missed due to various reasons (21). Therefore, it is stated that children should be followed up regularly (22). In Turkey, infants and children are followed up by nurses or midwives at FMUs. However, it will be more appropriate for infants and children coming for follow-up to be seen by the family physician in order to make an early diagnosis of ASD.

In Turkey, FPs receive training on various subjects in the medical faculty, during the family medicine residency training process and after starting the profession. Some of this training is about ASD. It was determined in our study that 86% of the FPs received training on ASD at least once during their medical education or in their professional life. In Altay's study, 66.7% of the participants had not received any training on ASD before (23). Although the proportion of physicians who received training seemed high in our study, all of them should have received this training in order for the physicians to make the correct diagnosis of ASD. Young physicians in Turkey mostly work in primary care during their obligatory state service after graduation. Even after this period, even when they specialize, physicians may encounter infants and children with whom ASD can be diagnosed early. In their study with the parents of children with ASD, Al-Mazidi et al. found that, they were diagnosed with ASD by non-physicians

**Table 4:** Levels of family physicians answering correctly to Knowledge about childhood autism among health workers (KCAHW) (n=151).

| Questionnaire Item | Correct answer | |
|---|---|---|
| **The following behaviors best describe a child with Childhood Autism:** | **n** | **%** |
| A1. Marked impairment in use of multiple non-verbal behaviors such as eye to eye contact, facial expression, body postures and gestures during social interaction? | 146 | 96.7 |
| A2. Failure to develop peer relationship appropriate for developmental age? | 150 | 99.3 |
| A3. Lack of spontaneous will to share enjoyment, interest or activities with other people? | 134 | 88.7 |
| A4. Lack of social or emotional reciprocity? | 132 | 87.4 |
| A5. Staring into open space and not focusing on any thing specific? | 125 | 82.8 |
| A6. The child can appear as if deaf or dumb? | 119 | 78.8 |
| A7. Loss of interest in the environment and surroundings? | 145 | 96.0 |
| A8. Social smile is usually absent in a child with Autism? | 118 | 78.1 |
| B1. Delay or total lack of development of spoken language? | 139 | 92.1 |
| C1. Stereotyped and repetitive movement (e.g. Hand or finger flapping or twisting)? | 143 | 94.7 |
| C2. May be associated with abnormal eating habit? | 50 | 33.1 |
| C3. Persistent preoccupation with parts of objects? | 125 | 82.8 |
| C4. Love for regimented routine activities? | 102 | 67.5 |
| D1. Autism is Childhood Schizophrenia? | 96 | 63.6 |
| D2. Autism is an auto-immune condition? | 85 | 56.3 |
| D3. Autism is a neuro-developmental disorder? | 108 | 71.5 |
| D4. Autism could be associated with Mental Retardation? | 84 | 55.6 |
| D5. Autism could be associated with Epilepsy? | 52 | 34.4 |
| D6. Onset of Autism is usually in, (A) Neonatal age, (B) Infancy, (C) Childhood | 65 | 43.0 |

**Table 5:** Comparison of Autism Spectrum Disorder (ASD) knowledge level and characteristics of family physicians (n=151)

| Characteristics | KCAHW score Mean±SD | P value |
|---|---|---|
| Age | | 0.032 |
| 25-39 years | 14.49±2.19 | |
| 40 years and above | 13.65±2.48 | |
| Sex | | 0.352 |
| Female | 14.22±1.97 | |
| Male | 13.87±2.68 | |
| Occupational years | | 0.370 |
| 0-5 years | 14.26±2.49 | |
| More than 5 years | 13.90±2.33 | |
| Training about ASD | | 0.580 |
| Received | 14.07±2.34 | |
| Not received | 13.75±2.71 | |
| Follow-up of patients with ASD | | 0.406 |
| Yes | 14.25±2.29 | |
| No | 13.91±2.44 | |

(24). The presence of physicians with insufficient training may cause the diagnosis to be made by people other than physicians, which may lead to a delay in the diagnosis.

Although 41.1% of the participants in our study had a child psychiatry internship during their medical education and specialization training, only 27.8% received training on ASD. The rate of those who did child psychiatry internships can be considered low. However, it is remarkable that the rate of those who received ASD training was lower than those who received a child psychiatry internship, which shows that ASD education had been neglected during medical education and residency training, including child psychiatry. It was seen in our study that FPs received training on ASD mostly as in-service training (65.6%). In their study in Pakistan, Imran et al. suggested that physicians fail to diagnose ASD due to the developmental, cognitive and emotional characteristics of ASD and the presence of various misperceptions, therefore, in-service training should be emphasized (25). The importance of in-service training cannot be denied, but it is seen that there is a great lack of medical faculties and institutions providing specialist training.

According to our study, about seven out of ten FPs had not received any training on ASD during their medical education. Similarly, about eight out of ten FPs who were family medicine specialists had not received ASD training during their residency training. These show that ASD is ignored both in medical faculties and during residency training. In addition, although the level of knowledge of FPs who received training is higher than those who did not, the lack of statistically significant difference raises questions about the quality and method of education given to FPs. The fact that ASD training

is not done continuously may also cause this result. In fact, only 21.5% of the FPs received ASD training in the last two years. Therefore, Altay emphasizes that annual trainings on ASD should be organized (23). According to our study, although the prevalence and awareness of ASD has increased worldwide, no difference was found in our study group in the ASD knowledge level. In our study group, the time spent in the profession did not affect the level of ASD knowledge, which makes us think that there has not been a positive change in ASD training in medical education and specialty education. In the study conducted by Imran et al. in Pakistan, they concluded that the frequency and experience of encountering people with ASD increased with the increase in professional years, and this facilitated diagnosis (25). Consequently, only one third of the FPs participating in our study thought that they were self-sufficient in ASD. Awareness of ASD and other mental illnesses was found 41.5% in Van't Hof et al.'s study with FPs. The rate is quite low in both studies. Van't Hof et al. reported that this inadequacy causes delays in the diagnosis of ASD (26).

In Altay's study, the participants stated that the most common clinical features in children with ASD were inability to make eye contact (72.9%) and repetitive movements (47.9%) (23). In our study, however, FPs scored lower in the fourth area, which specifically questions whether autism is a neurodevelopmental disorder, examines comorbid conditions, and investigates the age at which it occurs. The three most common wrong answers to the scale items show that FPs had a lack of knowledge about abnormal eating habits, epilepsy co-diagnosis and the onset time of ASD. The content of the trainings can be adapted according to the items that show FPs' lack of knowledge.

Another factor affecting the early diagnosis of ASD by FPs is related to the time allocated to the patient. The World Medical Association states that the time to be allocated per patient should be at least 20 minutes for the qualified delivery of health care and good medicine. Zwaigenbaum et al. state that FPs should ask the family about their concerns about ASD each time they meet with babies and should follow the children who apply more carefully (9). In our study, nearly half of the FPs examine more than fifty patients a day; therefore, it is not possible for the family physician to allocate twenty minutes per patient. The family physician may not find enough time to participate in the follow-up of infants and children. In this case, even if awareness level of the family physician is sufficient, diagnosis of ASD may be delayed. The high number of patients shortens the time that the family physician will devote to his patient and his own education, not only preventing the early diagnosis of ASD, but also leading to overlooking many important diseases.

### *Limitations of the Study*

The strength of this study is that it is one of the few studies on this subject in our country. The limitation of the study is that it is single-centred and descriptive cross-sectional type.

### CONCLUSION

The increasing frequency of ASD has made it an important public health problem. Since the etiology of ASD is unknown, primary prevention measures cannot be effective in preventing the disease. Therefore, the importance of early diagnosis as a secondary preventive measure is increasing. According to our study, there is a lack of information about ASD in FPs working in primary care, which is the place where sick and healthy infants and children first meet with healthcare professionals. FPs are also aware of this situation and do not feel sufficient. As a result, ASD should take place sufficiently during medical education, especially in pediatrics, family medicine, public health and child psychiatry internships. ASD should definitely take place in the process of specialization training such as family medicine and pediatrics. At the same time, it is crucial that FPs be given regular training seminars and renewal trainings on ASD throughout their professional lives. Particular attention should be paid to the areas of lack of knowledge of FPs in this and similar studies.

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# Nail Puncture Wound in Emergency Department

Acil Serviste Delici Çivi Yaralanmaları

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**ABSTRACT**

**Introduction:** *We examined the demographic and clinical characteristics of patients who presented to the emergency department with nail-related injury. We investigated the relationship between the risky occupation and work areas and the injury site.*

**Method:** *Our work was retrospective. The patients who admitted to the emergency department between 1 January 2018 and 31 December 2018 were screened. Demographic and clinical characteristics, occupations, the area where the injury occurred and the wound site of the patients were recorded from the patient files. The foot injury was divided into 3 anatomical regions. Descriptive statistics and chi-square test were used for the analysis of the data. P value <0.005 was considered significant.*

**Results:** *We examined 106 cases with the nail-related injury.. The mean of ages was 36.25 ± 16.71 and 79 (74.5%) of 106 patients were male. The area was mostly personal gardens (29.2%) and construction site (29.2%). The most common occupation was construction work (29.2%). The wound site was mostly on the foot (85.8%). Zone 1 injury was the most common foot injury (68%).*

**Conclusion:** *The nail-related injuries were mostly common in men, in the middle-age and on the foot. The foot injuries were common in Zone 1.*

**ÖZET**

**Amaç:** *Acil servise delici çivi yaralanması ile başvuran hastaların demografik ve klinik özelliklerini incelendik. Riskli meslek grupları ve çalışma alanlarının yaralanma bölgesiyle olan ilişkisini araştırdık.*

**Gereç ve Yöntem:** *Çalışmamız retrospektifti. 1 Ocak 2018-31 Aralık 2018 tarihleri arasında acil servise başvuran hastaların demografik ve klinik özellikleri, meslekleri, yaralanmanın gerçekleştiği alan ve yara yeri hasta dosyalarından kaydedildi. Ayak tabanı yaralanması 3 anatomik bölgeye ayrıldı. Verilerin analizinde tanımlayıcı istatistik ve ki-kare testi kullanıldı. İstatistiksel anlamlılık p<0.05 olarak belirlendi.*

**Bulgular:** *Çivi yaralanması olan 106 hasta çalışmaya alındı. Hastaların 79 (%74.5) erkekti ve yaş ortalaması 36,25±16,71 idi. Yaralanmanın gerçekleştiği alanlar en fazla kişisel bahçeler (%29,2) ve inşaat alanları (%29,2) idi. En yaygın meslek inşaat işçiliği idi (%29,2). Yaralanma yeri en çok ayak idi (%85,8). Ayak yaralanması en çok Bölge 1'de görüldü (%68).*

**Sonuç:** *Çiviye bağlı yaralanmalar en sık erkeklerde, orta yaş grubunda ve ayak bölgesinde görüldü. Ayak yaralanmaları en sık Bölge 1 idi.*

## INTRODUCTION

Nail puncture injuries were environmental injuries and usually occur in the upper and lower extremities, especially on the foot sole. Serious complications such as cellulitis, abscess, necrotizing soft tissue infections, and osteomyelitis may develop after nail puncture injury (1,2,3). In this case, the treatment and recovery process may be adversely affected.to the patients. In addition, the extremity injuries cause loss of labor and affect negatively the quality of life as psychological and socio economic.

Epidemiological data are important for preventive attempts to reduce such injuries. In our study, we examined the demographic and clinical characteristics of patients who admitted to the emergency department (ED) with nail puncture wound. We evaluated the factors that may affect the patients' injuries and defined the risky patient group. Thus, we aimed to contribute to the literature.

## MATHERIAL AND METHOD

Our study was designed retrospectively. Ethical approval dated 24.02.2022 and numbered 1804 was obtained from the local ethics committee.

Patients who admitted to the ED with the nail puncture wound between January 1, 2018 and December 31, 2018 were screened from the hospital automation system. 106 patients were included in the study. Patients' demographic and clinical characteristics, occupation, area where the injury occurred and wound site were recorded from patient files. The ages of the patients were divided into 5

Table 1: Distrubition of patients' gender and age.

|  |  | Male (n) (%) | Female (n) (%) | Total patient number (%) |
|---|---|---|---|---|
| Age Groups | 0-6 | 0 | 1 (1) | 1(1) |
|  | 7-16 | 12 (11) | 0 | 12 (11) |
|  | 17-34 | 32 (30) | 7 (7) | 39 (37) |
|  | 35-64 | 34 (32) | 17 (16) | 51 (48) |
|  | 65+ | 1 (1) | 2 (2) | 3 (3) |
| Total patient number(%) |  | 79 (75) | 27 (25) | 106 (100) |

groups as 0-6, 7-16, 17-34, 35-64 and 65+ years. The areas where the injury occurred were divided into 2 as 'Low risk and High risk area'. The low risk areas were determined as domestic, indoor areas, personal gardens; the high risk areas were determined as roads, open workplace and agricultural areas. All patients included in the study were divided into 2 groups as 'High Risk Patient (HRP) and Low Risk Patient (LRP)'. Those working in the high risk area were included in the HRP group. Those working in the low risk area were included in the LRP group.

Wound site of patients was defined into 3 regions as hand-foot-leg. We also divided the foot injury into 3 anatomical regions:

**Zone 1:** The area from the neck of the metatarsals to the tip of the foot.

**Zone 2:** The area from the end of the calcaneus to the neck of the metatarsals.

**Zone 3:** Contains the tarsal bones and joints.

Patients with foot injuries were included in the HRP or LRP group according to the type of shoes they wore. Patients wearing steel-link work shoes or boots were in the LRP group. Other patients were in the HRP group.

SPSS for Windows version 16.0" (SPSS Inc. Chicago, IL, USA) was used for statistical analysis. In our study, the results were determined as numbers and percentages. Chi-square test was used to compare the data. For statistical significance, $p<0.05$ was determined.

**RESULTS**

We included 106 cases with nail puncture wound. Of the patients, 79 (74.5%) were male and 27 (25.5%) were female. The minimum age of the patients was 6, the maximum was 80, and the mean age was $36.25 \pm 16.71$ years. The patients were mostly seen in the 35-64 age group (48%). In Table 1, we summarized the age distribution of the patients and gender. We found a statistically significant difference between age groups and gender ($p=0.014$).

The distribution of patients according to risk group is summarized in Table 2. Of the patients, 55 (51.9%) were in the HRP group, and 51 (48.1%) were in the LRP group. In the LRP group, the most injuries were in personal gardens (29.2%). In the HRP group, the most injuries were in the construction area (29.2%). The most common occupation was construction work (29.2%). We found a statistically significant difference between the risk groups of the patients and their gender ($p=0.000$). The number of male patients was 52 (49%) in HRP and 27 (25.5%) in LRP group. 91 (86%) of the patients had foot injuries, 13 (12%) patients had hand injuries and 2 (2%) patients had leg injuries. Foot injury was more common in HRP

(51.6%). Foot injuries were most common in Zone 1 (68%). The number of patients in Zone 1 was equal in the HRP and LRP groups.

**DISCUSSION**

Nail puncture wound are usually minor injuries and the complication rate of nail puncture wound is between 3-15% (4,5). Patients often present to the ED for wound dressing or tetanus prophylaxis. Early diagnosis and wound care are very important for patients (6,7). Some nail injuries, especially those caused by a nail gun, can cause more serious injuries such as head trauma in the literature (8,9). In our study, there was no injury with a nail gun. However, we collected data demographic characteristics and environmental factors in patients with nail related injury.

According to studies in the literature, most of the patients with nail related injuries were male (2,10,11). In our study, male gender was more common in the HRP group. High-risk patients were mostly construction workers. This result can be attributed to the fact that the men work more in high-risk areas that require heavy workload and strength. In the LRP group, the male-female ratio was almost equal. Low-risk areas were indoors and personal gardens. In these areas, people walk unprotected with thin rubber shoes, slippers and even bare feet. Therefore, the probability of injury increases in low-risk areas (Figure 1,2)

In our study, most of the patients were in the 35-65 age group. The number of pediatric patients (0-16 years) was low, but injuries were more common in boys. In our geography, boys see the garden and empty construction areas as playgrounds. It may be the answer to the question of why the number of boys is high. Creating social living spaces especially for children can play an important role in preventing such accidents.

In the study of Sui et al, construction site workers were found the most affected group in plantar puncture injury (10). In our study, nail puncture wound were more common at the construction sites too. The high incidence of nail-related injuries in high-risk areas indicates that safety precautions are not taken adequately. It should not be forgotten that such accidents can be prevented or reduced with the complete safety of the workplace and the use of appropriate equipment.

Nail puncture wound can occur in different parts of the body. According to the study of Patzakis et al, the most of injuries was on the foot and the most injured zone was Zone 1 in the hospitalized patients with the penetrating injury (2). On the other hand, in the study of Mark et al, they found that the most injured area was Zone 3 in children with

**Table 2:** Risk Distrubition of patients'.

| Distrubition of patients | | Total number of patients | High risk patient group (%) | Low risk patient group (%) |
|---|---|---|---|---|
| Gender | Male | 79 (74,5) | 52 (49) | 27 (25.5) |
| | Female | 27 (25,5) | 3 (2.9) | 24 (22.6) |
| Occupation | Construction worker | 31(29.2) | 31(29,2) | 0 |
| | Employee | 24 (22,6) | 14 (13,2) | 10 (9,4) |
| | Unemployed | 24 (22.6) | 0 | 24 (22,6) |
| | Student | 15 (14,2) | 0 | 15(14,2) |
| | Agricultural worker | 10 (9,4) | 10 (9,4) | 0 |
| | Officer | 2 (1.9) | 0 | 2(1,9) |
| Area where the injury occurred | Agricultural area | 10 (9,4) | 10 (9,4) | 0 |
| | Construction areas | 31 (29,2) | 31 (29,2) | 0 |
| | Workplaces | 14 (13,2) | 4 (3,7) | 10 (9,4) |
| | Indoors area | 10 (9,4) | 0 | 10 (9,4) |
| | Roads | 9 (8.6) | 9 (8,6) | 0 |
| | Factories | 1 (1) | 1 (1) | 0 |
| | Personal gardens | 31(29,2) | 0 | 31 (29,2) |
| Foot Injury Zone | Zone 1 (%) | 62 (68) | 31 (34) | 31 (34) |
| | Zone 2 (%) | 20 (22) | 12 (13,2) | 8 (8,8) |
| | Zone 3 (%) | 9 (10) | 47 (51,6) | 5 (5,6) |
| Total number of patients | | 106 (100) | 55 (51,9) | 51 (48,1) |

plantar punctures injuries (1). In the study of Laughlin et al, Zone 1 was found the most injured area in the pediatric patients with infected foot wound (3). According to our study, the foot was the most injured area in both HRP and LRP groups. This reason might be in order that the foot sole was the most affected area by the scattered nails. The studies carried out that the complications of the foot injury were mostly common in Zone 1 (2). The incidence of injury in our study was the same as the region with the highest incidence of complications in the literature. Failure to use personal protective equipment can result in deeper injury and increased serious complications, especially in foot sole injuries. Depending on body weight, the risk of complications may increase, since the penetrating effect is more in foot sole injuries. In the study of Patzakis et al, complications were found the highly in the patients who wore tennis shoes among hospitalized patients (2). In the study of Rubin et al., no significant difference was found in complications of patients wearing rubber-soled shoes (11). In the study of Siu et al., sole injuries were



**Figure 1:** A 7-year-old girl who admitted to our ED with a nail puncture injury



**Figure 2:** A 60-year-old female patient who admitted to our ED with nail puncture injury.

most common in patients who wore sport shoes and non-protective shoes (10). In our study, we could not obtain data on the follow-up of the patients. This is a limiting factor for our study.

**Limitations**

Our study was designed retrospectively. We could not follow up the wounds of the patients, and we could not reach data on this. Therefore, we could not obtain information about the healing process and complications.

**CONCLUSION**

Nail pucture wound were most common in men, middle-aged and on the foot. Zone 1 injuries were the most common injuries of the foot. According to our study, HRP group did not use protective shoes and equipment at work, and low-risk patients did not comply with environmental and personal protection measures.

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# ORIGINAL ARTICLE

# The Performance of Risk Scoring Systems Used for Severe COVID-19 Cases in The Emergency Department

Acil Serviste Ciddi COVID-19 Vakalarında Kullanılan Risk Puanlama Sistemlerinin Performansı

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**ABSTRACT**

**Introduction:** *The aim of this study is to evaluate the performance of CURB-65, Quick Sequential Organ Failure Assessment (qSOFA), and National Early Warning Score 2 (NEWS 2) scores in predicting mortality in COVID-19 patients in emergency department.*

**Method:** *A total of 502 patients diagnosed with severe COVID-19 in the emergency department of a pandemic hospital were analyzed retrospectively. Demographic, clinical and laboratory data of the patients were obtained from the hospital registry system. The CURB-65, qSOFA, and NEWS2 scores of each patient were calculated separately. These patients were divided into two groups as those who survivor and those who non-survivor. All parameters and calculated risk scores were statistically compared between these two groups.*

**Results:** *While 281 out of 502 patients survivor, 221 non-survivor. When the CURB-65, NEWS2, qSOFA scores were compared between the two patient groups, a significant difference was found (p<0.001 for all ). NEWS2 had the highest values with a sensitivity of % 92.3 and an NPV of % 90.2 when it was ≥8 (AUC: 0.861, p<0.001).*

**Conclusion:** *Because the NEWS2 score is superior to CURB-65 and qSOFA for predicting mortality, it can be used in the triage of severe COVID-19 patients, predicting prognosis and improving outcomes.*

**ÖZET**

**Amaç:** *Acil serviste COVID-19 hastalarında mortaliteyi öngörmede CURB-65, Quick Sequential Organ Failure Assessment (qSOFA) ve Ulusal Erken Uyarı Skoru 2 (NEWS 2) puanlarının performansını değerlendirmektir.*

**Yöntem:** *Bir pandemi hastanesinin acil servisinde ciddi COVID-19 tanısı alan toplam 502 hasta geriye dönük olarak incelendi. Hastaların demografik, klinik ve laboratuvar verilerine hastane kayıt sisteminden ulaşıldı. Her hastanın CURB-65, qSOFA ve NEWS2 skorları ayrı ayrı hesaplandı. Bütün hastalar hayatta kalanlar ve ölenler olarak iki gruba ayrıldı. Tüm parametreler ve hesaplanan risk skorları bu iki grup arasında istatistiksel olarak karşılaştırıldı.*

**Bulgular:** *502 hastanın 281'i hayatta kalırken, 221'i öldü. CURB-65, NEWS2, qSOFA skorları iki hasta grubu arasında karşılaştırıldığında, anlamlı fark bulundu (p<0,001). NEWS2 ≥8 iken, %92.3 hassasiyet ve %90.2 NPV ile en yüksek değerlere sahipti (AUC: 0.861, p<0.001).*

**Sonuç:** *NEWS2 skoru mortaliteyi tahmin etmede CURB-65 ve qSOFA'dan daha üstün bulunduğundan, ciddi COVID-19 hastalarının triyajında, prognozu tahmin etmede ve sonuçları iyileştirmede kullanılabilir.*

## INTRODUCTION

The new type of coronavirus disease (COVID-19) caused by SARS-CoV-2, spread rapidly in a short time and was declared a worldwide pandemic by the World Health Organization. While the mortality rate is 7% in those younger than 60 years of age, it rises to 55% in those over 60 years of age (1). Therefore, early diagnosis, initiation of treatment and making the decision for hospitalization are important for the prognosis. To date, many prognostic models have been proposed to predict severe pneumonia, sepsis and death (2). Since the beginning of the pandemic, emergency services have played an important role as first line of management. Hence, the effort towards a simplified prognostic risk score model that will facilitate triage, especially in emergency room settings, is still ongoing. Prognostic scores can improve the clinical decision making in COVID-19 and this practice has been supported by international guidelines (3).

The CURB-65 score, which consists of 5 parameters, is a scoring system used for guidance in the treatment of community-acquired pneumonia (CAP). CURB-65 was confirmed to estimate the clinical outcomes in viral pneumonia. Mortality has recently been determined to increase in COVID-19 patients over 65 years of age, indicating the prognostic value of CURB-65 (4).

The National Early Warning Score 2 (NEWS 2) is a scoring

system based on routine physiological measurements and studies conducted with emergency service population indicating that the prediction value of NEWS 2 for mortality and the hospitalization at intensive care unit (ICU) are high (AUC: 0.768, 0.857, respectively) (3,5).

The Sequential Organ Failure Assessment (SOFA) score has been reported to be related to an increased mortality rate in COVID-19 patients. The Quick Sequential Organ Failure Assessment (qSOFA) score that consists of 3 clinical parameters was first developed for assessment of septic patients, it has also recently been reported to be effective for estimation of mortality in non-sepsis patients (6).

These scoring systems can help predict the prognosis and mortality rates of critically ill patients, especially in situations such as pandemics (7). This study was evaluated the performance of the mentioned risk scores in predicting mortality in COVID-19 patients in emergency department (ED).

## MATERIAL AND METHOD

### Study design

A total of 502 patients who had been diagnosed with severe COVID-19 in the ED and hospitalized in the ICU of a pandemic hospital between 01.04.2020 and 01.02.2021 who fulfilled the inclusion criteria, were retrospectively analyzed. The pandemic hospital where the cases were collected is a training and research hospital with a daily emergency service admission of 1000-1500 people and a 900-bed capacity. Between these dates, a total of 750 patients were examined retrospectively, but 248 patients were excluded from the study according to exclusion criteria. These patients were divided into two groups as those who survivor and those who non-survivor. All parameters and calculated risk scores were statistically compared between these two groups. The study was approved by the Necmettin Erbakan University Faculty of Medicine Local Ethics Committee (date: 19/03/2021 and number: 2021/3166) and conducted in accordance with the ethical principles of the Declaration of Helsinki.

### Study population

The following criteria were considered for the diagnosis of severe COVID-19 pneumonia: 1- Presence of fever and respiratory tract infection findings and/or 2- Respiratory rate>30/min and/or 3-Severe respiratory distress (dyspnea, tachypnea, use of extra respiratory muscles) and/or 4-Oxygen saturation at room temperature of <90% (PaO2/FiO2≤300 in patients receiving oxygen) and/or 5-Presence of the characteristic thorax computed tomography (CT) findings of COVID-19 pneumonia (bilateral lobular, peripheral, widespread patchy ground glass opacities) (4,8). Patients whose thorax spiral tomography (CT) report was approved by a radiologist or a pulmonologist, and in whom real-time reverse transcriptase polymerase chain reaction (RT-PCR) tests was found to be positive, were included in the study.

### Exclusion criteria

Patients younger than 18 years, pregnant women, those with chronic obstructive pulmonary disease, cancers, immunosuppressive patients, those who had been exposed to trauma, those whose information could not be accessed from the electronic registry system and whose unconfirmed diagnosis of SARS-CoV-2 infection, were excluded from the study.

### Data collection

Age, gender, Glasgow Coma Scale (GCS) score, systolic blood pressure, fever, pulse, respiratory rate, saturation, need for nasal O2 support, urea, lymphocyte, ferritin, procalcitonin, D-dimer values, PCR results, thorax CT report, need for mechanical ventilation (non-invasive/invasive/high-flow nasal cannula oxygen) and the clinical outcomes (discharge/ in-hospital mortality) were obtained retrospectively from the patient epicrisis forms. The CURB-65 score, which consists of the parameters of confusion, urea, respiratory rate, systolic blood pressure and age, is scored from 0 to 5. While a score of 0-1 indicates low mortality, a score of ≥2 is associated with higher mortality (4). In the qSOFA score, 1 point is assigned to each of the respiratory rate, GCS score and systolic blood pressure parameters. A qSOFA score of ≥2 indicates high in-hospital mortality (9). The NEWS2 score uses fever, pulse, systolic blood pressure, respiratory rate, level of consciousness, saturation, and supportive oxygen parameters. Each parameter is given a score between 0 and 3. NEWS is divided into three categories: low risk (0-4), medium risk (5-6) and high risk (≥ 7) (10). The CURB-65, qSOFA and the NEWS2 scores of each patient were calculated separately at the admission of emergency service.

### Statistical Analysis

A descriptive analysis was performed. The categorical data were given as ratios and numbers. They were compared using the chi-square test. The distribution of numerical data was examined using the visual and analytical methods. There were no normally distributed variables and non-normally distributed variables were given as median and interquartile range (IQR). The differences between survivors and non-survivors were compared using the Mann– Whitney U test for non-normally distributed variables. The diagnostic decision-making properties of NEWS2, CURB-65 and qSOFA in predicting mortality were analyzed by the Receiver Operating Characteristics (ROC) curve analysis. In the presence of significant breakpoints, the sensitivity, specificity, positive predictive (PPV) and the negative predictive values (NPV) of these limits were calculated. In the assessment of the area under the curve, cases with a Type-1 error level below 5% were interpreted as the diagnostic value of the test being statistically significant. Cases with a p value of < 0.05 were considered statistically significant. Statistical analysis was calculated using the IBM SPSS 22 program.

### RESULTS

The comparison of the demographic, clinical and laboratory results of the two patient groups (1. Survivor patients, 2. Non-survivor patients) has been presented in Table 1. While 281 out of 502 patients survivor, 221 non-survivor. The mortality rate was 44%. The mean age of all patients was 73 (IQR 18) years and 260 (51.8%) were male. There was a significant difference between the groups with regard to age and gender (p<0.05). The mean duration of hospital stay was 10 days (IQR 9) and no significant difference was found between the groups (p=0.089). While age, clinical and laboratory

**Table 1:** Comparison of demographic, clinical and laboratory findings of survivor and non-survivor patients

| Variable | All patients (n=502) | | Survivor patients (n=281) | | Non survivor patient (n=221) | | p-Value |
|---|---|---|---|---|---|---|---|
| | Value | Min - Max | Value | Min - Max | Value | Min - Max | |
| Age. median (IQR). years | 73 (18) | 20 – 105 | 72 (21) | 21 – 105 | 75 (16) | 20 – 93 | 0.020* |
| Male. n(%) | 260(51.8) | | 128(45.5) | | 132(59.7) | | 0.002* |
| Female. n(%) | 242(48.2) | | 153(54.5) | | 89 (40.3) | | |
| GCS. median (IQR) | 12 (4) | 6 – 15 | 14 (3) | 8 – 15 | 10 (4) | 6 – 15 | <0.001* |
| Urea. median (IQR). mg/dL | 53.5 (51) | 13 – 343 | 47 (44) | 13 – 273 | 66 (68) | 17 – 343 | <0.001* |
| Respiratory rate. median (IQR) | 18 (16) | 10 – 38 | 12 (4) | 10 – 36 | 28 (6) | 12 – 38 | <0.001* |
| Saturation. median (IQR) | 80 (12) | 35 – 97 | 85 (8) | 35 – 97 | 77 (12) | 50 – 95 | <0.001* |
| Fever. median (IQR).°C | 36.8 (1.6) | 35 – 41 | 36.4 (0.5) | 35 –38.5 | 37.8 (0.7) | 36 – 41 | <0.001* |
| Heart rate. median (IQR) | 85 (45) | 60 – 150 | 75 (20) | 60 – 130 | 120 (30) | 60 – 150 | <0.001* |
| SBP. median (IQR). mmHg | 100 (30) | 10 – 185 | 120 (30) | 80 – 185 | 95 (15) | 10 – 170 | <0.001* |
| Receiving O2 support. n(%) | 300(59.8) | 35 – 97 | 107(35.7) | 35 – 97 | 193(64.3) | 50 – 95 | <0.001* |
| Lymphocyte count. median (IQR). 103/mL | 0.74(0.55) | 0.96 –43 | 0.82(0.54) | 0.96 –32 | 0.60(0.54) | 2.8 – 43 | <0.001* |
| Ferritin. median (IQR). µg/L | 320 (573) | 8 – 2800 | 247 (529) | 8 – 1800 | 398.5(615) | 20 –2800 | <0.001* |
| D-dimer. median (IQR). µg/mL | 1.2 (6.8) | 0.1–45507 | 0.9 (3.6) | 0.1 – 2983 | 2 (8.6) | 0.1- 45507 | 0.003* |
| PRC. median (IQR). µg/mL | 0.2 (0.7) | 0 – 105 | 0.2 (0.4) | 0 – 100 | 0.4 (1.4) | 0 – 105 | <0.001* |
| MV support. n(%) | 252 (50.2) | | 58 (23) | | 194 (77) | | <0.001* |
| Consolidation in CT. n(%) | 440 (87.6) | | 232 (52.7) | | 208 (47.3) | | <0.001* |
| Length of stay in hospital. median (IQR). day | 10 (9) | 1 – 57 | 10 (9) | 1 – 53 | 10 (10) | 1 – 57 | 0.089 |
| CURB-65. median (IQR) | 2 (2) | 0 – 5 | 1 (1) | 0 – 3 | 3 (2) | 0 – 5 | <0.001* |
| NEWS2. median (IQR) | 9 (4) | 3 – 19 | 7 (3) | 3 – 16 | 11 (5) | 3 – 19 | <0.001* |
| qSOFA. median (IQR) | 1 (1) | 0 – 3 | 1 (1) | 0 – 3 | 2 (2) | 0 – 3 | <0.001* |

†GCS: glaskow coma scale. SBP: systolic blood pressure. PRC: procalcitonin. MV: mechanical ventilation. CT: Computed tomography.

findings other than saturation, systolic blood pressure and lymphocytes, CURB-65, NEWS2 and qSOFA scores of the non-survivor were higher (p<0.05), also their nasal O2 and mechanical ventilation requirements were higher (p<0.001). When these three risk scores were compared between the patient groups, a significant difference was found (p<0.001).

The ROC analysis of the CURB-65, NEWS2, and qSOFA scores in predicting mortality has been demonstrated in Figure 1. The AUC values of these scores in prediction of mortality have been displayed in Table 2, and NEWS2 had the highest AUC value compared to other scores. But

**Table 2:** Area under the receiver operating characteristics curve (AUROC) for the scoring system in predicting severe COVID-19 mortality.

| Scores | AUC | 95% confidence interval | p-Value |
|---|---|---|---|
| NEWS2 | 0.861 | 0.828 – 0.894 | <0.001* |
| CURB-65 | 0.833 | 0.797 – 0.869 | <0.001* |
| qSOFA | 0.761 | 0.719 – 0.803 | <0.001* |

qSOFA had the lowest AUC value in other scores (AUC: 0.861, 0.833, 0.761, respectively).

The sensitivity, specificity, PPV and NPV values in estimating mortality according to the cut-off values of the scores have been demonstrated in Table 3. When compared with CURB-65 and qSOFA, NEWS2 had the highest values with a sensitivity of 92.3% and an NPV of 90.2% when it was ≥8. When compared with NEWS2 and qSOFA, CURB-65 had the highest values with a specificity of 97.9% and an PPV of 95.4% when it was ≥3.

**DISCUSSION**

Advanced age, comorbidity and the male gender are risk factors for the development of severe COVID-19 (11). Cheng P et al. stated that most patients with COVID-19 pneumonia were male, elderly and had comorbid diseases. They also stated that the need for non-invasive and invasive ventilator support, mortality and hospital stay of these patients were 49.1%, 37.7%, 30% and 35 days, respectively (12). In our study, most of the patients who non-survivor were elderly and male, and the need for nasal O2 support and mechanical ventilation was higher than those who survivor. The fact that all patient groups

**Table 3:** Diagnostic performance of score systems in predicting mortality.

| | Score (n) | Death (n) | Sensitivity (%) | Specificity (%) | PPV (%) | NPV (%) |
|---|---|---|---|---|---|---|
| CURB65 | <2 (177) | 28 | 87.3 | 53 | 59.4 | 84.2 |
| | ≥2 (325) | 193 | | | | |
| | <3 (372) | 97 | 56.1 | 97.9 | 95.4 | 73.9 |
| | ≥3 (130) | 124 | | | | |
| NEWS2 | <8 (174) | 17 | 92.3 | 55.9 | 62.2 | 90.2 |
| | ≥8 (328) | 204 | | | | |
| | <9 (242) | 35 | 84.2 | 73.7 | 71.5 | 85.5 |
| | ≥9 (260) | 186 | | | | |
| qSOFA | <2 (315) | 88 | 60.2 | 80.8 | 71.1 | 72.1 |
| | ≥2 (187) | 133 | | | | |

in our study consisted of those hospitalized in ICU can be explained as the reason for the higher mortality rate and shorter hospital stay.

Early diagnosis and treatment of severe COVID-19 patients can prevent ICU admissions and even death. Therefore, emergency physicians must distinguish those with high mortality risk. With early warning scoring systems, decisions can be made to provide advanced care conditions for patients to be admitted to the ICU (13). Therefore, studies are ongoing to develop a scoring system that can predict the prognosis in patients with COVID-19 (14). The scoring systems used thus far in sepsis and pneumonia have also been evaluated for COVID-19, but it has not yet been determined whether or not these scores can also be used in COVID-19 patients (15). Community-acquired pneumonia guidelines have recommended that patients with a CURB-65 score of 0 and 1 should be treated as outpatient, those with a score of 2 should be hospitalized and those with a score of 3 or above should be evaluated for admission to the ICU (16). Guo J et al. reported that the cut-off value of CURB-65 ≥2 value could serve to predict the rapid progression of COVID-19 and



**Figure 1:** Roc analysis of scores in predicting mortality.

death4. Satıcı C. et al. also found 73% sensitivity and 85% specificity when CURB-65 was ≥ 2, in predicting the 30-day mortality (17). Shi Y. et al. also reported that NPV was 97% in inpatients and 88% in critically ill patients when CURB65 was ≥22. Bradley P. et al. stated that low CURB-65 scores did not support early COVID-19 discharge, and that only high scores could predict poor outcomes (18). According to the results of our study, AUC value for CURB-65 score was 0,833. Sensitivity was found to be 87.3%, PPV 59.4% and NPV 84.2% when cut-off value was ≥2. While high NPV found in our study enabled to better discriminate patients with low mortality and may prevent these patients to be unnecessarily hospitalized in ICU. So, as mentioned by Bradley et al., CURB-65 score seems to be able to be used only when cut-off value is ≥2 in triage of severe COVID-19 patients.

Due to its simple, rapid, and acceptable accuracy, the qSOFA score used for septic patients can be used in the ED or during hospitalization in cases where SOFA parameters cannot be obtained (7). Seymour CW et al. associated a qSOFA score of 2 or higher with increased hospital mortality9. However, in several studies, it was stated that qSOFA did not have an appropriate predictive power for the severity of the disease and mortality in COVID-19 (19,20). Jang JG et al. attributed the inability of SIRS and the qSOFA scores to predict poor outcomes in COVID-19 patients whose oxygen saturations were usually low to 'silent hypoxemia' (21). Consistent with the literature, the qSOFA score in our study showed the lowest performance in predicting mortality among other risk scoring systems (AUC 0.76). Despite the advantage of being a simple and fast-calculated score, when used alone, qSOFA may insufficient in predicting the mortality in this group of patients, most of whom are hypoxic.

Many studies have shown that the measurement of NEWS2 at the time of admission to the ED can predict important clinical outcomes such as severe sepsis, ICU admission, duration of hospital stay and mortality (22,23). Respiratory failure, which usually develops without circulatory failure, is a distinctive feature in COVID 19 patients (24). Sun Q et al. reported that the need for oxygen support was an independent risk factor for severe COVID pneumonia (25). The reason for the high predictive value of NEWS2 in COVID-19 has been associated with respiratory failure,
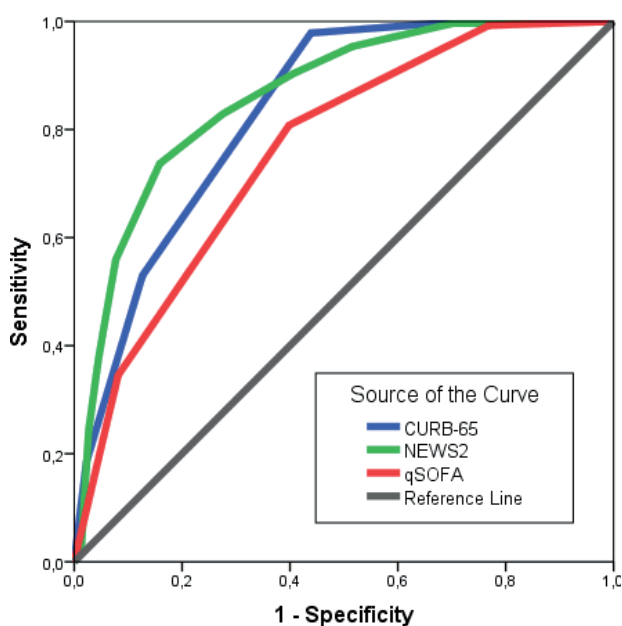
hypoxia and oxygen need (21). Myrstad et al. showed that when the NEWS2 score on admission was ≥6, its power in predicting severe disease and mortality was higher than other risk scores (26). Covino et al. emphasized that NEWS scores could be used to identify COVID-19 patients who could be followed in the non-ICU setting due to their high NPV (27). According to the results of our study, the NEWS2 score showed a higher AUC value (0.861) compared to CURB-65 and qSOFA, and reached the highest sensitivity and NPV values when NEWS was ≥8. The reasons for the superiority of NEWS2 to the other two scores for prediction of prognosis may be defined as follows: 1-Saturation, the need for oxygen support, fever and pulse parameters are also included. 2- Due to its high NPV, NEWS2 may exhibit a better performance in prediction of the patients who do not need hospitalization in ICU or who have a low mortality risk, particularly in emergency service.

## LIMITATION
Our study had some limitations. First, our study was single-centered, retrospective and observational, and the validity of the data recorded through the hospital electronic registry system was not externally verified. Therefore, it should be confirmed by larger and multi-center studies. Second, we did not determine the risk factors such as smoking, alcohol consumption, immobilization, obesity and liver function tests that could determine the time of onset of symptoms, admission to the ED and mortality. Third, most of the patients had been transferred from another center to our hospital (as it is a pandemic hospital). Information regarding the initial presentation of these patients to the other hospitals could not be accessed.

## CONCLUSION
The NEWS2 score can be used in the triage of severe COVID-19 patients, as its predictive value for mortality is superior to that of CURB-65 and qSOFA. We suggest that it can predict the prognosis and improve the results. With more comprehensive, prospective studies carried out in the future, new models can be created to develop a specific prognostic score for COVID-19.

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# Üniversite Acil Servisine 112 Ambulans ile Başvuran Hastaların Uygunluk Düzeyinin Değerlendirilmesi

Evaluation of the Suitability of Patient Acceptance in Emergency Medicine Department in University Hospital with 112 Ambulances

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## ABSTRACT
***Introduction:*** *Objective: Inappropriate use of emergency health services for the non-emergent issues is a universal problem. The aim of our study is to evaluate the necessity of bringing the patients who applied to our emergency service with the 112 ambulance to the university emergency service for more effective use of pre- and post-hospital emergency health services and indirectly the suitability of ambulance use.*
***Material and Method:*** *Our study is a descriptive-cross-sectional study. Subjects followed retrospectively and prospectively. 3731 patients who applied with 112 ambulances and whose ambulance registration form could be obtained were included in our study. For the information of the patients included in the study, 112 ambulance response forms and the automation system of our hospital were used.*
***Results:*** *60,9% of the participiants were male, and the mean age of all participiants was 47,02. The most common diagnoses/prediagnoses made by 112 were falling, traffic accident and chest pain. 112 and emergency service when the diagnosis/prediagnoses were examined, it was seen that there was a statistically significant difference according to gender and age. Outcome data of the patients were analyzed. It was observed that the highest rate in intensive care unit admissions was in the emergency service intensive care unit and in the service hospitalizations in the orthopedics service. When the places where the patients were taken by 112 were examined, it was observed that 80,9% were from home-crime places.*
***Conclusion:*** *Demographic features play an effective role in the use of emergency ambulance services. Pre-hospital healthcare personel should be made aware of vital signs measurement and triage. Improper use of ambulance and high discharge status due to this is one of the important problems related to the health system. Providing the necessary coordination and cooperation in the referrals made through 112 will contribute to the correct use of resources by reducing unnecessary referrals.*

## ÖZET
***Amaç:*** *Acil sağlık hizmetlerinin uygunsuz, acil olmayan sebeplerle kullanılması evrensel bir sorundur. Çalışmamızın amacı hastane öncesi ve sonrası acil sağlık hizmetlerinin daha etkin kullanımı için 112 ambulansı ile acil servisimize başvuran hastaların üniversite acil servisine getirilme gerekliliği ve dolaylı yoldan ambulans kullanım uygunluğunu değerlendirmektir.*
***Gereç ve yöntem:*** *Çalışmamız tanımlayıcı-kesitsel bir çalışmadır. Retrospektif ve prospektif olarak izlenmiştir. Çalışmamıza 112 ambulans ile başvuran ve ambulans kayıt formu temin edilebilen 3731 hasta dahil edilmiştir. Hastaların çalışmaya dahil edilen bilgileri için 112 ambulans müdahale formu ve hastanemizin otomasyon sisteminden yararlanılmıştır.*
***Bulgular:*** *Çalışmaya dahil edilen hastalardan %60,9'u erkek, tüm hastaların yaş ortalaması 47,02 idi. 112 tarafından en sık konulan tanılar düşme, trafik kazası ve göğüs ağrısı olarak görüldü. 112 ve acil servis tanıları incelendiğinde cinsiyete ve yaşa göre istatistiksel olarak anlamlı düzeyde fark olduğu görüldü. Hastaların sonlanım verileri incelendi. Yoğun bakım ünitesi yatışlarında en yüksek oranın acil servis yoğun bakım, servis yatışlarında ise ortopedi servisi olduğu görüldü. Hastaların 112 tarafından alındıkları yerler incelendiğinde %80,9'unun ev-olay yerinden olduğu gözlendi.*
***Sonuç:*** *Demografik özellikler acil ambulans hizmetleri kullanımında etkili rol oynamaktadır. Hastane öncesi sağlık personeli vital bulguların ölçümü ve triyaj konularında bilinçlendirilmelidir. Uygunsuz ambulans kullanımı ve buna bağlı gelişen yüksek taburculuk durumu, sağlık sistemi ile alakalı önemli sorunlarından biridir. 112 aracılığıyla yapılan sevklerde gerekli koordinasyon ve iş birliğinin sağlanması gereksiz sevkleri azaltarak kaynakların doğru kullanılmasına katkı sağlayacaktır.*

## GİRİŞ
Ülkemizde acil müdahale gerektiren durumlar ve doğal afetler sık görülmektedir (1). Bu durumlarda müdahalede önemli bir yer tutan acil sağlık hizmetlerinin gelişmesi ve iyi organize olması gerekmektedir.

Acil sağlık hizmetlerine talep her geçen gün artmaktadır (2). Acil olmayan sebeplerle acil sağlık hizmetlerinin kullanımının artması mevcut kaynakları zorlamaktadır

**Tablo 1:** Çalışmada gözlenen hastaların cinsiyet ve yaş özellikleri

| Özellik | | n (%) |
|---|---|---|
| Cinsiyet | Erkek | 2272 (%60,9) |
| | Kadın | 1457 (%39,1) |
| Yaş ortalaması (min-maks) | | 47,02 (1-97) |
| Yaş grup | <18 | 574 (%15,4) |
| | >18 | 3155 (%84,6) |
| Erkek yaş ortalaması (min-maks) | | 44,66 (1-97) |
| Kadın yaş ortalaması (min-maks) | | 50,69 (1-97) |

**Tablo 2:** 112 tarafından en sık konulan 20 tanı

| Tanı | n |
|---|---|
| Düşme | 850 |
| Trafik kazası | 444 |
| Göğüs ağrısı | 439 |
| MI | 184 |
| Ağrı | 140 |
| Karın ağrısı | 121 |
| AİTK | 113 |
| Kafa travması | 90 |
| SVO | 90 |
| GIS kanama | 77 |
| Kesi | 72 |
| Darp | 68 |
| Senkop | 65 |
| *Tanı Yok | 61 |
| Dispne | 57 |
| Covid-19 | 43 |
| GDB | 42 |
| YDT | 42 |
| Hipertansiyon | 39 |
| Baş dönmesi | 37 |

Tanılar ambulans kayıt formunda yazıldığı şekliyle yazılmıştır. MI: miyokard enfarktüsü, AİTK: araç içi trafik kazası, SVO: serebrovasküler olay, GIS: gastrointestinal sistem, GDB: genel durum bozukluğu, YDT: yumuşak doku travması, (*): tanı yazılmış hastalar

ve günümüz sağlık sistemi ile alakalı ciddi sorun oluşturmaktadır.

Çalışmamızda 112 ambulans kullanım uygunluk düzeyi, hastanemiz acil servisine 112 ambulansı ile getirilen hastalar incelenerek değerlendirilmeye çalışıldı.

**GEREÇ VE YÖNTEM**

Çalışmamıza Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi Acil Tıp Anabilim Dalına 112 ambulans ile başvuran ve 112 ekipleri tarafından doldurulan kayıt formlarına ulaşılabilen hastalar dahil edilmiştir. Çalışmamız tanımlayıcı-kesitsel bir çalışmadır.

Çalışmamıza 2019 yılı başından 19.06.2020 tarihine kadar retrospektif, bu tarihten 2020 sonuna kadar ise prospektif olmak üzere 3731 hasta dahil edilmiştir.

Gerekli veriler 112 Ambulans Müdahale Formu ve hastanemizin otomasyon sisteminden elde edilmiştir. Çalışmamızın parametreleri; cinsiyet, yaş, 112 tarafından ve acil serviste konulan tanılar, 112 tarafından yapılan işlemler ve ölçülen vital bulgular, hastaların 112 ekipleri tarafından nereden getirildiği, triyaj kodu, sonlanım durumu olarak kaydedildi.

Çalışmamız Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi İlaç ve Tıbbi Cihaz Dışı Araştırmalar Etik Kurul Başkanlığınca 19.06.2020 tarihinde 2020/2611 sayılı karar ile onaylandı.

**İstatistiksel Analiz**

Verilerin normal dağılıma uygunluğu Shaphirowilk testi ile test edilmiş, normal dağılıma sahip özelliklerin 2 bağımsız grupta karşılaştırılmasında Student t testi, normal dağılmayan özelliklerin 2 bağımsız grupta karşılaştırılmasında Mann Whitney u testi kullanılmıştır. Ayrıca sayısal verilerin 2'den fazla bağımsız grupta karşılaştırılmasında normal dağılım gösteren özellikler için Tek yönlü varyans analizi (ANOVA) ve LSD çoklu karşılaştırma testleri, normal dağılmayan özellikler için ise Kruskal Wallis testi ve Allpairwise çoklu karşılaştırma testi kullanılmıştır. Kategorik değişkenler arasındaki ilişkiler Pearson veya Kesin Ki kare testi ile incelendi. Tanımlayıcı istatistik olarak sayısal değişkenler için ortalama±standart sapma, medyan kategorik değişkenler için ise sayı ve % değerleri verilmiştir. İstatistiksel analizler için SPSS Windows version 24.0 paket programı kullanılmış ve $p<0.05$ istatistiksel olarak anlamlı kabul edilmiştir.

**BULGULAR**

Çalışmamıza 3731 hasta dahil edilmiştir. Çalışmaya dahil edilen hastalardan %60,9'u erkek ve tüm hastaların yaş ortalaması 47,02'dir. Demografik veriler Tablo 1.'de görülmektedir.

Acil servisimize getirilen hastaların, 112 tarafından konulan en sık 20 tanısı Tablo 2.'de görülmektedir. Buna göre en sık konulan tanılar; düşme, trafik kazası ve göğüs ağrısı olmuştur.

Çalışmamızda acil serviste konulan tanılar ile 112 tarafından konulan tanılar başvuran hasta sayısının fazla olması ve tanı çeşitliliği sebebiyle sistem ve patolojilere göre sistematik olarak sınıflandırılmıştır.

112 tarafından konulan tanılar incelendiğinde cinsiyete göre istatistiksel olarak anlamlı düzeyde fark olduğu görüldü (p=0,001). Erkek hastalarda kardiyovasküler sistem ile ilgili tanılara (%22,7) rastlanma oranı yüksek gözlenirken, kadın hastalarda en sık gözlenen 112 tanısı düşme ve düşme veya iş kazası (%29,3) idi.

Benzer olarak acil servis tanılarının da cinsiyete göre istatistiksel olarak anlamlı düzeyde farklı olduğu görüldü (p=0,001). Erkeklerde kardiyovasküler sistem ile ilgili tanılar (%22,1) yüksek oranda gözlenirken, kadınlarda en sık düşme ve düşme veya iş kazası (%30,5) gözlendi.

112 tanılarının yaş grubuna göre istatistiksel olarak anlamlı düzeyde farklı olduğu görüldü (p=0,001). 18 yaş üstü bireylerde kardiyovasküler sistem ile ilgili tanılar (%24,2) yüksek oranda gözlenirken, 18 yaş altında en sık düşme ve düşme veya iş kazası (%52) tanısı gözlendi.

Acil serviste yaşa göre konulan tanılar incelendiğinde 112 tarafından konulan tanılarla benzer sonuçlara rastlandı. 18 yaş üstü bireylerde kardiyovasküler sistem ile ilgili

**Tablo 3:** Acil ve 112 tanı dağılımları

| Tanı | 112 n (%) | Acil n (%) | Ki kare | p |
|---|---|---|---|---|
| Düşme ve Düşme veya iş kazası | 850 (23,2) | 935 (25,3) | | |
| Kardiyovasküler sistem ile ilgili tanılar | 750 (20,5) | 797 (21,5) | | |
| Trafik kazası ve multitravma | 633 (17,3) | 693 (18,7) | | |
| Santral sinir sistemi ile ilgili tanılar | 353 (9,6) | 262 (7,1) | | |
| Gastrointestinal sistem ile ilgili tanılar | 250 (6,8) | 280 (7,6) | | |
| Genel semptomlar | 249 (6,8) | 246 (6,7) | | |
| Kas iskelet sistemi ile tanılar | 143 (3,9) | 106 (2,9) | | |
| Darp veya travmaya maruz bırakılma | 109 (3,0) | 112 (3,0) | | |
| Solunum sistemi ile ilgili tanılar | 73 (2,0) | 98 (2,6) | 75,61 | 0,001 |
| Genitoüriner ve renal sistem ile ilgili tanılar | 50 (1,4) | 43 (1,2) | | |
| Koronavirüs hastalığı veya şüphesi | 43 (1,2) | 20 (0,5) | | |
| KBB ve göz hastalıkları ile ilgili tanılar | 37 (1,0) | 33 (0,9) | | |
| Psikiyatri ile ilgili tanılar | 32 (0,9) | 8 (0,2) | | |
| Allerji böcek yılan akrep sokması | 31 (0,8) | 31 (0,8) | | |
| Hematoloji ve onkoloji ile ilgili tanılar | 23 (0,6) | 2 (0,1) | | |
| Diğer | 14 (0,4) | 11 (0,3) | | |
| Suicid | 13 (0,4) | 17 (0,5) | | |
| Endokrin sistem ile ilgili tanılar | 9 (0,2) | 5 (0,1) | | |

KBB:Kulak Burun Boğaz

**Tablo 4:** 112 ambulansta ölçülen ve acil serviste ölçülen bulguların kıyaslanması

| | 112 ort±SS (m) | Acil ort±SS (m) | z | p |
|---|---|---|---|---|
| SKB | 127,37±24,64 (120) | 128,37±22,49 (120) | -3,69 | 0,001 |
| DKB | 77,06±13,91 (80) | 75,98±13,73 (75) | -4,69 | 0,001 |
| Nabız | 90,83±19,02 (88) | 87,03±19,52 (83) | -10,98 | 0,001 |
| Ateş | 36,61±3,44 (36,3) | 36,41±1,66 (36) | -0,57 | 0,568 |
| Satürasyon | 95,91±5,44 (97) | 95,94±5,33 (97) | -1,95 | 0,052 |
| Kan şekeri | 155,30±81,06 (126) | 157,73±78,98 (132) | -1,62 | 0,107 |

Z değeri Man Whitney U testinden elde edildi. SS:Standart sapma
SKB:sistolik kan basıncı, DKB:diyastolik kan basıncı

**Tablo 5:** 112 tarafından ve acil serviste yapılan vital ölçümlerinin sıklıklarının kıyaslanması

| | 112 | | Acil | | Ki kare | p |
|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | | |
| SKB | 3018 | (81,0) | 3010 | (80,7) | 0,11 | 0,742 |
| DKB | 3036 | (81,4) | 3048 | (81,7) | 0,11 | 0,739 |
| Nabız | 3044 | (81,6) | 3031 | (81,3) | 0,11 | 0,740 |
| Ateş | 1141 | (30,6) | 3006 | (80,6) | 1887,90 | 0,001 |
| Satürasyon | 3060 | (82,1) | 3017 | (80,9) | 1,78 | 0,182 |
| Kan şekeri | 478 | (12,8) | 493 | (13,2) | 0,26 | 0,608 |

tanılar (%25,5) yüksek oranda gözlenirken, 18 yaş altı düşme ve düşme veya iş kazası tanısının (%55,3) daha sık gözlendiği görüldü.

Acil ve 112 tanı dağılımları Tablo 3.'de sunuldu. Tanı dağılımları incelendiğinde acil tanıları ve 112 tanıları arasında istatistiksel olarak anlamlı düzeyde fark olduğu gözlendi (p=0,001).

112 tarafından yapılan işlemlerin dağımı incelenmiştir.

112 tarafından hastaların %61,3'üne damaryolu açılmış, %1,8'ine hava yolu ve solunum desteği verilmiştir, %3,9'una ilaç kullanılmış, %19,7'sine stabilizasyon işlemi yapılmıştır.

112 tarafından ölçülen ve acil serviste ölçülen vital bulguların karşılaştırmaları Tablo 4.'de sunulmuştur. Bazı vital parametre değerleri arasında istatistiksel ve rakamsal olarak anlamlı fark görülmesine rağmen bu farkın klinik

**Tablo 6:** Sonlanım ile ilgili dağılımlar

| | | n (%) |
|---|---|---|
| Sonlanım | Taburcu | 2119 (58,0) |
| | Yatış | 1482 (40,6) |
| | Eksitus | 51 (1,4) |
| Yoğun Bakım Ünitesi Yatış | Acil | 377 (43,6) |
| | Kardiyoloji | 294 (34,0) |
| | Göğüs Cerrahi | 48 (5,6) |
| | Beyin cerrahi | 40 (4,6) |
| | Genel Cerrahi | 32 (3,7) |
| | Anestezi ve Reanimasyon | 20 (2,3) |
| | Kardiyovasküler cerrahi | 16 (1,9) |
| | Covid-19 | 10 (1,2) |
| | Nöroloji | 8 (0,9) |
| | Dahiliye | 7 (0,8) |
| | Pediatri | 5 (0,6) |
| | Çocuk cerrahi | 4 (0,5) |
| | Göğüs | 3 (0,3) |
| Servis Yatış | Ortopedi | 236 (38,2) |
| | Covid-19 | 66 (10,7) |
| | Kardiyoloji | 48 (7,8) |
| | Plastik cerrahi | 45 (7,3) |
| | Genel Cerrahi | 44 (7,1) |
| | Gastroenteroloji | 43 (7,0) |
| | Beyin Cerrahi | 33 (5,3) |
| | Göz | 17 (2,8) |
| | Nöroloji | 17 (2,8) |
| | Onkoloji | 14 (2,3) |
| | Göğüs | 11 (1,8) |
| | KVC | 10 (1,6) |
| | Kadın hastalıkları ve doğum | 8 (1,3) |
| | Psikiyatri | 6 (1,0) |
| | Göğüs Cerrahi | 4 (0,6) |
| | İntaniye | 4 (0,6) |
| | Dahiliye | 3 (0,5) |
| | Üroloji | 3 (0,5) |
| | Acil | 2 (0,3) |
| | Dermatoloji | 2 (0,3) |
| | Nefroloji | 2 (0,3) |

olarak anlamlı olduğu söylenememektedir.

112 ve acil serviste yapılan vital parametre ölçüm sıklıkları Tablo 5.'de görülmektedir. Ateşi ölçülen hasta sayısında anlamlı düzeyde farklılık görülmüştür. Diğer vital parametrelerin ölçüm sıklıkları benzer bulunmuştur. (p=0,001)

Sonlanım ile ilgili veriler Tablo 6.'da verilmiştir. Taburcu olanların oranı %58, eksitus olanların oranı ise %1,4

**Tablo 7.** Hastaların 112 tarafından getirildiği yere göre sonlanım dağılımları

| | Dış merkez (sağlık kurumu) | | | |
|---|---|---|---|---|
| | Var n (%) | Yok n (%) | Ki kare | p |
| Yatış | 520 (79,50) | 962 (32,10) | | |
| Taburcu | 126 (19,30) | 1993 (66,50) | 503,94 | 0,001 |
| Eksitus | 8 (1,20) | 43 (1,40) | | |

olarak gözlendi. Yoğun bakım ünitesi yatışlarında en yüksek oran acil servis yoğun bakım, servis yatışlarında ise %38,2 ile ortopedi servisi olduğu görüldü.

112'ye gelen çağrılar incelendiğinde %18'inin dış merkezden (sağlık kurumu) yapıldığı, %80,9'unun ev-olay yerinden yapıldığı gözlendi.

Tablo 7.'de görüldüğü üzere dış merkezden (sağlık kurumu) gelen çağrılar ile sonlanım arasındaki istatistiksel olarak anlamlı düzeyde ilişkiye rastlanmıştır (p=0,001). Dış merkezden (sağlık kurumu) gelen çağrıların %79,5'lik bölümünde yatış gözlenirken dış merkez (sağlık kurumu) harici çağrıların %66,5'lik bölümünün taburcu olduğu görülmektedir.

Triyaj kodlarına göre 112 tanıları ve acil servis tanıları karşılaştırılmıştır. 112 tarafından sarı kod verilenlerin %23,7 oranda, yeşil kod verilenlerin ise %23,5 oranında en sık düşme ve düşme veya iş kazası tanısı olduğu, kırmızı kod verilenlerin en sık %31,2 oranda kardiyovasküler sistem ile ilgili tanılar aldığı gözlendi.

Acil serviste konulan tanılara bakıldığında, sarı kod verilenlerin %25,9, kırmızı kod verilenlerin %27,8 oranla en sık kardiyovasküler sistem ile ilgili tanılar olduğu, yeşil kod verilenlerin ise %24,5 oranında düşme ve düşme veya iş kazası tanısı aldığı gözlendi.

**TARTIŞMA**

Çalışmamızda 112 ambulansı ile acil servisimize getirilen hastaların aciliyetinin ve böylelikle de uygunluk düzeyinin değerlendirilmesi hedeflenmiştir.

Ülkemizde yapılan birçok çalışmada erkeklerin acil sağlık hizmetlerini kullanım oranı kadınlara göre yüksek tespit edilmiştir. 2013 yılında Kapçı ve arkadaşlarının yaptığı çalışmada acil servise ambulans ile getirilen hastaların %55'inin erkek olduğu görülmektedir (3). Çalışmamızda da hastaların %60,9'unun erkek olduğu, %39,1'inin kadın olduğu görülmüştür.

Ertan ve arkadaşlarının yapmış olduğu bir çalışmada hastaların yaş ortalaması 47,97 olarak bulunmuştur (4). Çalışmamızda da literatürle uyumlu şekilde tüm gruplar için yaş ortalamasının 47,02 olduğu tespit edilmiştir.

Türkiye genelinde ambulans çağrılarının en sık %67,3 oranında tıbbi nedenlerden olduğu, trafik kazalarına bağlı çağrıların %14,9 oranında olduğu bildirilmiştir (5). Bizim çalışmamızda da benzer sonuçlar mevcuttur. 112 tanılarına göre ilk sırada %59,5 ile medikal problemler, ikinci sırada %23,2 ile düşme ve düşme iş kazası, üçüncü sırada ise %17,3 ile trafik kazası ve multitravma vakaları yer almaktadır. 2015 yılında yapılan bir çalışmada 112 komuta kontrol merkezine yapılan çağrılar incelenmiş,

%71 medikal vakalar, %13 trafik kazaları ve %9 diğer kazalar olarak bulunmuştur (6). Bütün bu sonuçlar ülkemizde 112 acil sağlık hizmetlerinin genel olarak medikal vakalar nedeniyle arandığını desteklemektedir. Yurtdışı çalışmalarda da benzer sonuçlar elde edilmiştir. Olia ve arkadaşları İtalya'daki Prato Acil Servisine ambulansla gelen vakaları incelemişlerdir. %46 vaka travma dışı, %17 vaka travma ve %7,2 ise hastaneler arası transfer vakaları olarak değerlendirilmiştir (7).

Çalışmamızda 112 tarafından konulan tanılar incelendiğinde ise ilk sırada %23,2 ile düşme ve düşme veya iş kazası, %20,5 ile kardiyovasküler sistem ile ilgili tanılar, %17,3 ile trafik kazası ve multitravma, %9,6 ile santral sinir sistemi ile ilgili tanılar ve %6,8 ile gastrointestinal sistem ile ilgili tanılar bulunmaktadır. Karakuş ve arkadaşlarının yaptığı çalışmada acil servise başvuru nedenlerine bakıldığında en sık multitravma (18,2), göğüs ağrısı (%10,6), pulmoner hastalıklar (%9,4) ve nörolojik hastalıklar (%8) görülmüştür (8). En sık başvuru tanılarının travma ve kardiyovasküler sistem ile ilgili olması benzerdir.

Çalışmamızda acil servise ambulans ile getirilen hastaların %40,5'inin travma (düşme ve düşme iş kazası, trafik kazası ve multitravma) hastası olduğu görülmüştür. 3. basamak üniversite hastanesi olmamız ve multidisipliner değerlendirilmesi gereken multitravma hastalarının hastanemize getirilmesinin bu oranda etkili olduğu düşünmekteyiz. Çalışmamızda gastrointestinal sistem ile ilgili tanıların yüksek olmasında, ilimizde endoskopik retrogradkolanjiyopankreatografi (ERCP), endoskopi ve kolonoskopi yapılan merkezlerin az olması ve ilgili uzman hekim sayısının yetersiz olması ve hastanemizde bu işlemlerin yapılabilmesinin sevk oranını arttırarak etkili olduğunu düşünmekteyiz.

Çalışmamızda tespit ettiğimiz en sık 20 tanı (sistemlere göre gruplandırılmamış hali ile), Dünya Sağlık Örgütü (DSÖ) tarafından belirlenen "32 Acil Tıbbi Durum" tanılarıyla (9) yüksek oranda benzerdi. Çalışmamızda 112 tarafından konulan en sık yirmi tanı, toplam hastaların %82,3'ünü oluşturmaktadır. Acil servisimize getirilen en sık 20 tanıdan %63,7'si DSÖ tarafından belirlenen "32 Acil Tıbbi Durum" tanısı içinde yer alan tanılardan oluşmaktadır. Ancak yine ilk 20 tanıya bakıldığında, %36,3 hasta acil servise hayati tehlike oluşturmayan, hastane öncesi acil sağlık hizmetleri ihtiyacı olmayan sebeplerle başvurmuştur. Yapılan bir çalışmada, acil serviste konulan en sık yirmi tanı, toplam hastaların %77'sini oluşturmuş ve vakaların %53,7'sinin DSÖ'nün acil kriterlerine göre ambulans ile taşınmasının gereksiz olduğu görülmüştür (10).

Önge ve arkadaşlarının 2013 yılında yaptığı çalışmada ise 112 ekipleri tarafından vakaların %97,1'ine damar yolu açılmış, %89,3'ünün vital bulgularına bakılmış, %42,3'ünün satürasyon ölçümü yapılmıştır (11). Bizim çalışmamızda ise 112 ambulans ekibi tarafından hastaların %61,3'üne damaryolu açılmış, %81 hastanın tansiyon değerlerine bakılmış, %81,6 hastanın nabzı ölçülmüş, %30 hastanın ateşine bakılmış, %82,1 hastanın satürasyon değeri kaydedilmiş ve %12,8 hastanın kan şekeri ölçülmüştür.

Çalışmamızda 112 ile getirilen hastaların %40,6'sı hastaneye yatırılmıştır. %58 hasta taburcu edilmiş, %1,4 hasta ise eksitus olmuştur. Hastaneye yatırılan hastaların %57,6'sı yoğun bakım ünitesine yatırılmıştır. Gülen ve arkadaşlarının çalışmasında; %78 taburculuk, %21 yatış ve %1 eksitus oranı olduğu görülmektedir ve hastaneye yatan hastaların %60,1'i servise, %39,9'u yoğun bakıma yatırılmıştır (12). Çalışmamızda hastaneye yatış oranı yüksek saptanmıştır. Snooks ve arkadaşlarının yaptığı meta-analizde yüksek taburculuk oranı ambulansların uygunsuz kullanımının kriterlerinden biri olarak kabul edilmiştir (13).

2011 yılında yapılan bir çalışmada Köse ve arkadaşlarının çalışmasında en fazla yatış yapılan branşlar, %13,8 oranında genel cerrahi, %13,4 oranında nöroloji, %12 oranında ortopedi ve travmatoloji bölümlerine olmuştur (14). Bizim çalışmamızda ise yoğun bakımlar içinde de en yüksek yatış oranı %43,6 oranla acil yoğun bakım, servis yatışlarında ise en yüksek yatış oranı %38,2 ile ortopedi ve travmatoloji servisine olmuştur.

Çalışmamızda travma ile başvuran hasta sayısı oldukça fazladır. 112 tanısı düşme ve düşme veya iş kazası, trafik kazası ve multitravma olan hastaların %34'ü servis ve yoğun bakım ünitelerine yatırılmıştır. Yapılan bir çalışmada travma hastalarının %76,9'u taburcu edilirken, %18,5'inin hastaneye yatırıldığı görülmektedir (15).

Çalışmamızda 112 tarafından acil servisimize getirilen hastalar dış merkezden (sağlık kurumu) gelenler ve ev-olay yerinden alınan hastalar olarak sınıflandırıldı. 112 tarafından acil servisimize getirilen hastaların %80,9'u ev-olay yerinden alınmış, %18'i ise dış merkezden (sağlık kurumu) getirilmiştir. 2020 yılında yapılan bir çalışmada ise hastaların %9,4'ü ilçe hastanelerinden sevk ile gelmiştir (15).

Gülen ve arkadaşları acil servise sevk ile gelen hastaları incelediklerinde %54,6'sının hastaneye yatırıldığını, %45'inin taburcu edildiği ve %0,2'sinin ise eksitus olduğunu görmüşlerdir (12). Bizim çalışmamızda acil servisimize sevk ile 112 tarafından getirilen hastalar ile sonlanım durumu arasında istatistiksel olarak anlamlı düzeyde ilişkiye rastlanmıştır (p=0,001). Sevk ile dış merkezden (sağlık kurumu) 112 ambulans ile getirilen hastaların %79,5'lik bölümünde hastaneye yatış gözlenirken, ev-olay yerinden getirilen hastaların %66,5'lik bölümünün taburcu olduğu görülmüştür. Yapılan sevklerin yatış oranının fazla olması sevk uygunluğu yönünden olumlu karşılanmaktadır. Ancak ev-olay yerinden getirilen hastalardaki taburculuk oranı yüksek bulunmuştur.

Centers for Disease Control and Prevention (CDC) 2005 verilerinde acil servise başvuran hastaların %5,5'i çok acil, %13,9'u ise acil olmayan başvurulardan oluşmuştur (16). Aydın ve arkadaşları tarafından yapılan bir çalışmada acil servise başvuran hastaların aciliyetine göre sınıflandırmışlar, %16,5'inin çok acil, %21,2'sinin acil ve %62,3'ünün ise acil olmayan başvurular olduğunu görmüşlerdir (17). Bizim çalışmamızda 112 tarafından getirilen hastalardan %14,5 hasta yeşil (acil olmayan), %4,9 hasta kırmızı (çok acil), %48,5 hasta sarı kod (acil) ile getirildi. %30,07 hastada kod belirtilmemişti.

**KISITLILIKLAR**

Çalışmamıza 112 ekipleri tarafından doldurulan kayıt

formlarına ulaşılabilen hastalar dahil edildiğinden dolayı retrospektif olarak toplanan vakaların bazılarının acil servis arşivinde kayıt formlarına ulaşılamamıştır. Çalışmamız Covid-19 pandemisi ile çakışmıştır. Kontaminasyon sebebi ile bazı dosyalara ulaşım mümkün olmamıştır.

**SONUÇ**

Demografik özellikler acil ambulans hizmetleri kullanımında etkili rol oynamaktadır.

Vital bulgu ölçümleri hastane öncesi sağlık hizmetleri açısından hayati önem arz etmektedir ve ölçümlere daha fazla özen gösterilmesi gerekmektedir.

Çalışmamızda 112 tarafından yeşil kod ile getirilen hasta oranı düşük tespit edilmiştir. Bu sonuç hastane öncesi sağlık hizmetlerinin kullanımı açısından olumlu karşılanmakla birlikte, herhangi bir kod belirtilmeyen hastaların oranı da yüksek bulunmuştur. 112 çalışanlarının bu konuda bilinçlendirilmesi gerektiğini düşünmekteyiz.

Basit yaralanmaları içeren travma vakalarının 1. ve 2. basamak sağlık hizmeti verilen merkezlerde değerlendirilmesi, 3. basamak sağlık hizmeti veren merkezlerde olan yoğunluğun önüne geçilmesinde etkili olacak, böylelikle sınırlı kaynaklarımızın daha uygun kullanılmasına katkı sağlayacaktır. Travma vakalarının büyük çoğunluğunu oluşturan trafik kazalarının ve iş kazalarının önlenmesi için gerekli düzenlemelerin yapılmasının da kaynaklarımızın kontrollü kullanımı açısından önem taşıdığını düşünmekteyiz.

Uygunsuz ambulans kullanımını ve buna bağlı gelişen yüksek taburculuk durumu, acil servislerin gereksiz yere meşguliyetine sebep vermektedir. Bu sebeple acil çağrı merkezine yapılan çağrıların hastaneye götürülmesi konusunda daha seçici olunması gerekmektedir. Hastane öncesi acil sağlık hizmetleri hastaneler arası sevklerde ve koordinasyonda da önemli görevler üstlenmektedir. Yapılan sevklerde gerekli koordinasyon ve iş birliğinin sağlanması gereksiz sevkleri azaltarak kaynakların doğru kullanılmasına katkı sağlayacaktır.

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# ORIGINAL ARTICLE

# The Importance of Hemoperitoneum and Retrospective Analysis of Tubal Ectopic Pregnancy Cases Treated in Our Clinic

Kliniğimizde Tedavi Edilen Tubal Ektopik Gebelik Olgularında Hemoperitonumun
Önemi ve Retrospektif Analizi

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**ABSTRACT**
*Introduction:* *The aim of our study is to analyze retrospectively outcomes of tubal ectopic pregnancy treated in clinic and to highlight the significance of hemoperitoneum.*
*Material and Methods:* *Between January 2012 and August 2013, 86 women who were diagnosed with and treated for tubal ectopic pregnancy (EP) at this single-center clinic were enrolled in this study. Age, timing of the previous menstrual cycle, levels of human chorionic gonadotropin (hCG), size and presence of tubal EP masses, the fetal cardiac activity, and the methods of treatment were assessed and compared. The presence of hemoperitoneum and important factors in the choice of treatment were investigated.*
*Results:* *The patient's average age was 29.1±5.7 (16-41) years. The average level of β-hCG was 4448,5±8351,9 IU/L. 14 patients (16.3%) underwent laparatomy, 5 patients (5.8%) to laparoscopy, and 15 patients (17.4%) to expectant management. 46 patients (53.5%) received methotrexate (MTX) treatment, whereas laparoscopy and laparatomy were performed on 1 patient (1.2%) and 5 patients (5.8%), respectively, due to the failure of MTX treatment in 6 patients. The initial -hCG level (p=0.004), existence of abdominal bleeding (p=0.03), the size of ectopic pregnancy mass (p=0.005), and presence of fetal cardiac activity (p=0.001) were all detected to be statistically significant when compared to MTX therapy of tubal EP. The success rate of single dose MTX treatment was calculated as 69.5%*
*Conclusion:* *Presence of hemoperitoneum may be a risk factor for the decision to treat MTX because of surgical intervention. One of the alternative treatment for tubal EP is MTX therapy.*
**ÖZET**
*Amaç:* *Çalışmamızın amacı klinikte tedavi edilen tubal ektopik gebeliğin sonuçlarını retrospektif olarak incelemek ve hemoperitonumun önemini vurgulamaktır.*
*Gereç ve Yöntemler:* *Bu çalışma Ocak 2012 ile Ağustos 2013 tarihleri arasında tek merkezli kliniğimizde tubal ektopik gebelik (EP) tanı ve tedavisi yapılan 86 olgu dahil edildi. Yaş, son adet tarihi, insan koryonik gonadotropin (β-hCG) düzeyi, tubal EP kitlelerinin büyüklüğü ve varlığı, fetal kardiyak aktivite ve tedavi metotları değerlendirildi ve karşılaştırıldı. Tedavi yöntemleri için hemoperiton varlığı ve tedavi yöntemlerinin başarısını etkileyen faktörler araştırıldı.*
*Bulgular:* *Olguların yaş ortalaması 29,1±5,7 (16-41) yıl idi. Ortalama β-hCG düzeyi 4448,5±8351,9 IU/L idi. 14 olguya (%16.3) laparatomi, 5 olguya (%5.8) laparoskopi, 15 olguya (%17.4) ekspektan tedavi uygulandı. Metotreksat (MTX) tedavisi 46 olguya (%53,5), MTX tedavisi başarısızlığı nedeniyle 1 olguya (%1,2) laparoskopi, 5 olguya (%5,8) laparatomi uygulandı. Tubal EP'nin MTX tedavisi ile karşılaştırıldığında, başlangıç β-hCG düzeyi (p=0,004), intraabdominal kanama varlığı (p=0,03), ektopik gebelik boyutu (p=0,005) ve fetal kalp aktivite varlığı (p<0,001) gibi cerrahi metodu etkileyen faktörler istatistiksel olarak anlamlı bulundu. Tek doz MTX tedavisinin başarı oranı %69.5 idi.*
*Sonuç:* *Tedavi yöntemlerinde hemoperitonyumun varlığı MTX tedavisi için cerrahi tedaviye yol açan bir risk faktörü olabilir. MTX tedavisi tubal EP'de cerrahi tedaviye alternatif yöntemlerden biridir.*

## INTRODUCTION

Ectopic pregnancy, also known as abnormal localized pregnancy, occurs when the blastocyst implants outside of the uterine cavity (1). Approximately 95% of EP are localized in the different parts of the fallopian tubes (2). EP accounts of 2% of all pregnancies and is an important cause of maternal morbidity and mortality (3). EP is diagnosed with early term with both high-resolution ultrasonography and quantitative assessment of β-hCG. After the blastocyst develops, usually in the sixth to ninth gestational weeks, the tension of the fallopian tube wall increases and unilateral lower abdominal pain occurs. After the fallopian tube ruptures, intraabdominal bleeding may lead hematoperitoneum and hemorrhagic shock, also. Hemoperitoneum is common in EP, but it may also be seen in the absence of falopian tube rupture. In the presence

of hemorrhage in the abdominal cavity, the incidence of tubal rupture is only 50% to 62% (4, 5). Ultrasound examination of fallopian tube of EP in women with abdominal hemorrhage is not certain contraindication for MTX or expectant treatment. The presence of any degree of hemoperitoneum accurately supports neither falllopian tube rupture nor hemodynamic instability. In more than 80% of confirmed EP ruptured or unruptured, fluid accumulation in the cul-de-sac can be detected (5, 6). Compared with stable women, women with unstable hemodinamics have significantly more free blood accumulations in the cul-de-sac and lower hemoglobin levels (7). Mortality is now very rare, accounting for 0.05 % of cases (8).

Up to now, studies have been reported the important role of hemoperitoneum in predicting the effect of MTX treatment (9-12). These studies show that the predictive value of hemoperitoneum is weak. However, some studies have shown that MTX treatment is contraindicated in the presence of hemoperitoneum (13-16). However, the presence of hemoperitoneum in women diagnosed with EP is an important risk factor for failure of MTX treatment (17) and should be carefully examined. The purpose of this study is to present the importance of hemoperitoneum and retrospective analysis of tubal ectopic pregnancy cases treated in our clinic.

**MATERIAL AND METHODS**

This retrospective study analyzed 86 women diagnosed and treated for tubal EP in our clinic between January 2012 and August 2013. All patients provided written informed consent before MTX administration or surgical treatment. The Committee of Ethics for Research in Kahramanmaras Sutcu Imam University approved this study with decision no 2013/08-1 on May 16, 2013.

The patient files were analysed retrospectively. Patient's age, complaints, last menstrual date, β-hCG level, the presence of hemoperitoneum, the size and the presence of EP masses and fetal cardiac activity by transvaginal

**Table 1:** The characteristics of 52 women treated with MTX.

| Characteristic | Value |
|---|---|
| Age-yr | 29.2 ± 5.9 (16-41) |
| Gravidity no | 2.6 ± 1.2 (1-5) |
| Parity no | 1.1 ± 1.0 (0-3) |
| Free fluid in the cul-de-sac no (%) | 22 (47.8) |
| Fetal cardiac activity no (%) | 2 (4.3) |
| Identified ectopic mass no (%) | 49 (94.2) |
| Serum β- β-hCG level mIU/ml | 2483.4 ± 3728.5 (92-16514) |
| Serum progesterone level ng/ml | 6,81 ± 5.4 (2-18) |
| Ectopic mass in size-cm | 1.4 ± 0.9 |

ultrasound and treatment procedures were evaluated. The size of EP and the presence of hemoperitoneum described as the presence of echogenic free fluid (18) in the cul-de-sac or above the level of the uterine fundus or around the ovaries (19) are detected via ultrasound examinations.

EP was firstly considered in women refered for pelvic pain, vaginal bleeding and delayed menstrual cycle. Then non-tubal EP patients were excluded. Patients both referred for tubal EP or tubal EP and hemoperitenoum detected by ultrasound were evaluated a careful clinic examination for the presence or absence of an acute abdomen (rebound tenderness) and hemodynamic instability (hypotension, tachycardia and consciousness disability). The inclusion criterias for MTX treatment include absence of fetal cardiac activity, tubal EP, size of EP less than 4 cm, suitability for the follow-up and maximum three doses and criterias for surgery include acute abdomen and/ or hemodynamic instability, tubal EP and MTX treatment failure. Exclusion criteria include for MTX treatment include hepatic or renal failure, thrombopenia, anemia, non-tubal EP, an acute abdomen or a hemodynamic instability and criterias for surgery intervention include non-tubal EP and refuse MTX treatment.

All women were counselled about possible EP risks and treatment methods. All EP who had hemodynamic stability, not an acute abdomen, accepted MTX treatment protocols and suitable for MTX were administered single-dose MTX treatment (50 mg/m2) (20). Tanaka et al. first used MTX therapy in clinical use for the treatment of EP (21). Other women that had a clinic instability, an acute abdomen, refused MTX treatment and not suitable were performed salpingostomy or salpingectomy by laparoscopy or laparatomy.

The indications for MTX treatment were absence of fetal cardiac activity, size of EP less than 4 cm and suitability for the follow-up. MTX protocols contraindications include hepatic or renal failure, thrombopenia, anemia, an acute abdomen or a hemodynamic instability (17). The day 1 of the protocol was accepted as a day of injection. Plasma β-hCG levels were assessed on days 4 and 7. If β-hCG levels decreased more than 15% between day 4 and 7, weekly follow-up continued until they decreased below 5 mIU/mL. If they decreased less than 15% between day 4 and 7 or between weekly β-hCG levels, the MTX injection was administered again until maximum three doses. If they did not decrease after three injections or the presence of acute abdomen or hemodynamic instability during MTX treatment, treatment protocols were accepted failure and surgical intervention was recommended and performed.

Possible factors which are available for treatment procedure were compared. Outcomes of treatment methods and factors affecting the success of medical and surgical treatments were investigated.

**Statistical analysis**

Statistical analysis was performed by SPSS 16.0 version. Kolmogorov-Smirnov test is used to evaluate the uniformity of the distribution of continuous variables. The results of data are presented as mean, standard deviation (SD), frequency and percentages for categoric variables. In statistical analysis Mann Whitney test was used the to compare quantitative variables, Fisher's

**Table 2:** Distributions of maternal ages, parity, size of EP and mean gestational age in tubal EP treated with MTX.

| | | Cases | | Successful | |
|---|---|---|---|---|---|
| | | n =52 | % | n | % |
| Maternal Age | 15- 24 | 12 | 23.1 | 12 | 100 |
| | 25- 34 | 25 | 48.1 | 19 | 76 |
| | 35- 45 | 15 | 28.8 | 14 | 93.3 |
| Parity, n | 0-1 | 31 | 59.6 | 27 | 87.1 |
| | 2-3 | 20 | 38.5 | 18 | 90.0 |
| | ≥4 | 1 | 1.9 | 1 | 100 |
| Gestational Week | 0-4 | 9 | 17.3 | 9 | 100 |
| | 4-6 | 15 | 28.8 | 13 | 86.7 |
| | >6 | 28 | 53.8 | 23 | 82.4 |
| Size of EP mass, (cm) | 0-2 | 34 | 65.4 | 34 | 100 |
| | 2-3 | 11 | 21.2 | 10 | 90.9 |
| | 3-4 | 3 | 5.8 | 1 | 33.3 |
| | ≥4 | 4 | 7.7 | 0 | 0 |

test and X2-test for qualitative variables. Categoric variables, such as treatment failure were described using frequency distributions and are presented as numbers and percentages. Roc analysis was used for sensitive and specificity. Logistic regression analysis was used to model failure and odds ratio was estimated with 95% confidence intervals. Significance was determined as $p < 0.05$.

**RESULTS**
A total of 86 women with tubal EP were treated in our clinic (Figure 1). The mean age of the patients was 29.1±5.7 (16-41) years. The characteristics of 52 women who received with MTX for tubal EP are shown in Table 1. In the patient files, no severe side effects were observed in any of the patients who were given mtx treatment and only mild compliants such as abdominal pain in 3 patients, nausea in 5 patients were recorded.

The success rate of MTX is 100% among women under 25 age, 76% between 25 and 34 ages, and 93.3% between 35 and 45 ages. MTX success rate of MTX increases with the increase in maternal parity. The gravida number rate of women receiving MTX treatment is 1 to 6 times, 59.6%

of primiparas (n=31), 38.5% of 2-3 parities (n=20), and 1.9% of more than 4 parities (n=1). The overall success in MTX treatment was in multiparous women. The mean gestational age at diagnosis was 6.1 weeks ( Table 2). Among 86 women with tubal EP, 63 (73.2%) had ectopic masses and 38 (44.2%) had free fluid within coagulated blood or clots in the cul-de-sac, which was limited to the pelvic cavity and was detected by transvaginal ultrasound. Mean size of tubal EP was measured as 1.6±1.3 cm. The diagnosis success rate of MTX decreased with the increase in the size of tubal EP 46 patinents (p‹0.001) (Figure 2). The highest success rate of MTX occurs in women with a tubal EP in the size of 0 to 2 cm (%100). Of them, laparatomy was performed to 14 patients (16.3%), laparoscopy to 5 patients (5.8%), expectant management to 15 patients (17.4%). Inclusion criteria for MTX treatment were included in 52 women, only 46 patients (53,5%) were given MTX, 1 patients (1,2%) underwent laparascopy, and 5 patients (5,8%) failed due to MTX treatment and underwent laparatomy.
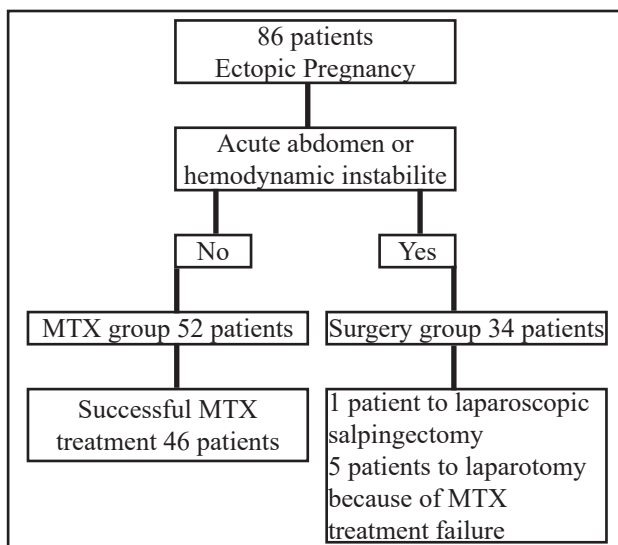
The mean β-hCG of women receiving MTX treatment was



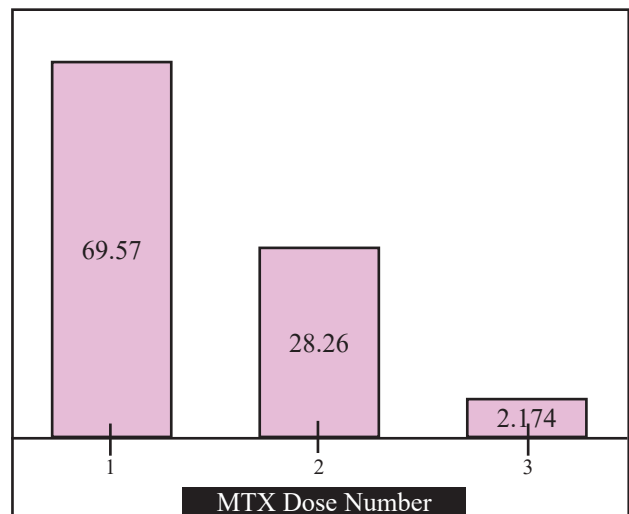**Figure 1:** Flow chart of EP patients management



**Figure 2:** Administration doses in women treated with MTX successfully.

**Table 3:** Possible factors affecting MTX success in EP

| Factor | MTX treatment | | |
|---|---|---|---|
| | Successful (n= 46) | Failure (n=6) | p |
| Age-y | 29 ± 6.1 | 30 3 ± 3.7 | 0.6 |
| Parity-no | 1 ± 1 | 1.3 ± 1.5 | 0.7 |
| Serum ß-β-hCG level-mIU/ml | 1637.8 ± 2755.6 | 8966.1 ± 4056.1 | <0.001 |
| Serum progesterone level-ng/ml | 5.3 ± 0.6 | 12.6 ± 6.5 | 0.7 |
| Size of ectopic mass-cm | 1.3 ± 0.1 | 3.8 ± 0.4 | <0.001 |
| Free fluid in cul-de-sac -no (%) | 21 (45.6) | 1 (2.1) | 0.10 |
| Fetal cardiac activity-no (%) | - | 2 (4.3) | <0.001 |

* mean ±SD

**Table 4:** Possible factors affecting management of surgical and MTX treatment.

| | Medical treatment n=46 | Surgery treatment n=19 | p |
|---|---|---|---|
| Age-y | 29.1 ± 6.2 | 30.5 ± 4.6 | 0.5 |
| Graviditiy-no | 2.6 ± 1.2 | 2.7 ± 1.5 | 0.5 |
| Parity-no | 1 ± 1 | 1.5 ± 1.2 | 0.1 |
| Progesterone level-ng/ml | 5.3 ± 4.6 | 6.8 ± 4.4 | 0.07 |
| Serum ß-β-hCG level-mIU/ml | 1637.8 ± 2755.6 | 9647.2 ± 12856.2 | 0.004 |
| Gestational week | 5.7 ± 2.0 | 6.3 ± 1.9 | 0.4 |
| Free fluid in cul-de-sac -no (%) | 21 | 15 | 0.03 |
| Fetal cardiac activity-no (%) | - | 8 | ‹0.001 |
| Size of ectopic mass-cm | 1.3 ± 0.9 | 2.3 ± 1.3 | 0.005 |

2798.4 ± 611 IU/L (95 % CI, 1572-4024.8 IU/L, median value 906 IU/L), 1571,7 (range 377-2795) for a single dose of MTX, 2114 IU/L (range 702-3525) for two doses of MTX and 1546 IU/L for three doses of MTX. β-hCG level cutt off value of 3035 IU/L for MTX treatment of EP had 75 percent sensitivity and 88.9% spesifity when compared to surgical and medical treatment and this β-hCG level was accepted a risk factor for MTX treatment.

Our clinic's overall treatment success rate was 88.5% (46/52) with 32 patients receiving a single dose, 13 patients receiving two doses, and one patient receiving three doses (Figure 1). Single-dose methotrexate treatment, on the other hand, showed a success rate of 69.5% (32/46). Six patients required surgical intervention as a result of MTX treatment failure.

Table 3 shows possible factors affecting tubal EP MTX success. The β-hCG levels, ectopic mass size and the presence of fetal cardiac activity for methotrexate therapy success were found statistically significant (p<0.001). However, initial β-hCG levels (p=0.004), presence of hemoperitenoum (p=0.03) and the presence of fetal cardiac activity (p<0.001) and EP size (p=0.005) were found to statistically significant factors affecting surgery management compared to MTX treatment for tubal ectopic pregnancy were detected statistically significant (Table 4). The presence of hemoperitoneum for management surgery and MTX treatment was found a significantly important factor (OR 4.2 (CI % 95 1.14;10.05), p=0.01).

**DISCUSSION**

Ectopic pregnancy is a big problem of pregnant women in early pregnancy terms. Decision on expectant, medical treatment or surgical treatment with transvaginal ultrasound, serum β-hCG level and clinic course of patients have a crucial role. In the first assessment, an experienced physician with a transvaginal ultrasound exam diagnoses 76 percent of EP and 91 percent of EP before surgery (22). This retrospective analysis of tubal EP and the absence of follow-up losses in our clinic was critical. In this study, we showed that using transvaginal ultrasound, we were able to detect 82.1% of EP.

MTX therapy is a widely used treatment method in the treatment of ectopic pregnancy. The feature of MTX in the treatment of ectopic pregnancy, is a folic acid analogue that acts as an antagonist by binding to dehydrofolate reductase, resulting in low tetrahydrofolic acid levels. Therefore, MTX is often used as an antineoplastic, immunosuppressive, and anti-inflammatory agent that inhibits cell proliferation and protein synthesis by suppressing the metabolism of cytostatics, as well as purine bases and nucleic acids (23).

Bonin et al. 2017 and Hemly et al. 2014 showed that the presence of clinic symptoms such as lower abdominal pain and uterine bleeding before treatment not affected treatment results (3, 24). Our study showed that when hemodynamic stability was, the clinic symptoms consisted of lower abdominal pain, abnormal uterine bleeding or the presence of hemoperitoneum don't have affected the treatment results. Because, these kind of complaints may be normally and seems as adverse or effect of MTX treatment.

Hemoperitoneum was not found to be a significant independent factor in determining MTX success or failure (p=0.10), but it was found to be a significant factor in the management of surgical and MTX treatment (p=0.01). If a patient has hemoperitoneum by ultrasonography but does not have an acute abdomen or hemodynamic instability, surgical techniques should be considered (25). The presence of hemoperitoneum increased the likelihood of surgical intervention with an OR of 4.0 when the surgical method and MTX treatment for EP management were examined (CI % 95 1.14;14.05).

Limpscomb et al. (1999) showed that the presence of hemoperitoneum in the cul-de-sac for medical treatment in EP was not an essential factor of success in a study of 350 women treated with MTX for tubal EP. Our study and Potter et al. study both reported similar results (9, 10). However, the existence of fetal cardiac activity, initial serum β-hCG level, and size of EP mass were all significant predictors. Orozco et al. (2015), Bonin et al. (2017) and Beguin et al. (2020), like this study, found that maternal age was not an important predictor of MTX treatment management (3, 16, 26). Hemoperitonoum's sensitivity and specificity were 0.63 and 0.76, respectively, in a study of 93 women treated with MTX (11). However, we discovered that its sensitivity and specificity were respectively 53.3% and 48.8%. Hemoperitenoum was not ruled out as a contraindication for a cautious EP approach in this investigation.

According to Potter et al. (2003), serum β-hCG levels on admission were the most critical risk factor in tubal EP management of for MTX success (10). Otherwise, a retrospective cohort study showed that the success of MTX treatment was not associated to maternal age, β-hCG level on admission and gestational age. But, gestational age after MTX treatment was found statistically significant at time of surgery intervention. For MTX treatment, EP size, fetal cardiac activity, and the presence of hemoperitoneum through ultrasound were not significant (27). The participants in this retrospective analysis were separated into two groups: group 1 (MTX before surgery) and group 2 (MTX after surgery) (surgery only). Clinic data, such as the number of groups, B-hCG levels higher than group 2, fetal heart activity rate, free fluid, and the existence of hemoperitonum between two groups, differed from literature data.

Beguin et al. study reported that on MTX treatment administration for EP more than β-hCG level of 4000 IU/L needed surgical intervention and this β-hCG level was shown a risk factor of failure of MTX treatment. The β-hCG cut off value for MTX success was described as 2439 IU/L, with a sensitivity of 66%, with a spesifity of 93,3% (16). In this study, we found that β-hCG level cutt off value of 3035 IU/L for MTX treatment of EP had 75 percent sensitivity and 88.9% spesifity when compared to surgical and medical treatment and this β-hCG level was accepted a risk factor for MTX treatment. Helmy et al. reported success rates and cut off values for the β-hCG levels of 2121 IU/L, Orozcu et al. reported below 1000 IU/L, while Marret et al. reported more than 2000 IU/L (24, 26, 28).

While we reported a 69 percent success rate of MTX treatment after single dose to treat EP, an overall success rate of 88 percent, according to other studies such as Bonin et al. (2017), Levin et al. (2019), Barbier et al. (2019), Beguin et al. (2020) and Sindiani et al. (2020), MTX treatment for EP have had a success rate of 65 to 95 percent (3, 16, 29-31). The success rate of our MTX tratment for EP was found to be similar to that seen in the literature. Althought the authors disagree on the cut-off β-hCG level for MTX treatment of EP in literature (28), when MTX treatment was received, β-hCG levels greater than 5000 IU/L should not be considered (15). According to a study by Beguin et al., EP patients with β-hCG level greater than 4000 IU/L required surgical intervention, and this β-hCG level was found to be a risk factor for MTX treatment failure.

Despite the fact that hemoperitoneum is a negative factor in MTX treatment, the success rate of MTX treatment has been found to be high, and hence, hemoperitoneum is not a certain contraindication to MTX treatment. The presence of hemoperitoneum on an ultrasound exam should be considered a significant factor when deciding whether to treat with MTX or surgery.

The study's limitations are that is retrospective, that the study group is small, and that hemoperitoneum is described quantitatively. Clinic examination, initial β-hCG levels, ectopic mass size, fetal cardiac activity and hemoperitoneum are the most predictive factors of MTX or surgical management for tubal EP treatment on admission in our clinic.

However, patient's clinical examination is normal, the most predictive factors for the success of MTX are the initial β-hCG level, ectopic mass size, fetal cardiac activity and the presence of hemoperitoneum. This situation shows that if patient's clinic exam is normal, the presence of hemoperitoneum is not an important risk factor of treatment choice. However, the analysis of patients undergoing surgery because of they refused MTX treatment or was suspected of being lost to follow-up in this study is a controversial issue. In addition, the patient's treatment choice and rejection is a natural right.

**CONCLUSION**

The presence of hemoperitoneum in treatment methods may be a risk factor for MTX treatment, leading to surgical treatment. MTX treatment is one of alternative method to surgical treatment in tubal EP

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# Ramipril Related Burning Mouth Syndrome: A Case Report

Ramipril İlişkili Yanan Ağız Sendromu: Vaka Sunumu

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**ABSTRACT**
*Burning mouth syndrome (BMS), or glossodynia, is a disease characterized by oral burning or similar pain without clinically evident causative lesions or any other possible causes. Many factors are accepted as possible causes for this disease, including some drugs. The present case of burning mouth syndrome, which started after the use of angiotensin-converting enzyme (ACE) inhibitor ramipril and whose symptoms disappeared after discontinuation of the drug may be insightful when it comes to determining the best treatment.*

**ÖZET**
*Yanan ağız sendromu (YAS) veya glossodini, klinik olarak belirli bir lezyon veya başka bir neden olmaksızın ağız-da yanma veya benzeri ağrı ile karakterize olan bir hastalıktır. Birçok faktör bu hastalığın olası nedenleri olarak kabul edilmektedir. Bazı ilaçların da bu sendroma neden olduğu bildirilmiştir. Anjiyotensin dönüştürücü enzim (ACE) inhibitörü ramipril kullanımından sonra başlayan ve ilacın kesilmesiyle semptomları kaybolan mevcut ağız yanması sendromu olgusu, ideal tedavinin belirlenmesi konusunda aydınlatıcı olabilir.*

## INTRODUCTION

Burning mouth syndrome (BMS), also known as glossodynia, is disease characterized by oral burning or similar pain without clinically evident causative lesions or any other possible causes (1). It has been found that this situation is more common among middle-aged and older women (2).

Although many factors are accepted as possible causes for this disease, the field of oral diseases has not seen much research done on the topic. Most notably, medications such as H-2 receptor antagonists, proton pump inhibitors, clonazepam, lisinopril, sertraline, venlafaxine and fluoxetine seem to be connected to the development of BMS (3).

In this article, we present a case of burning mouth syndrome, which started after the use of angiotensin-converting enzyme inhibitor (ACEI) ramipril and whose symptoms disappeared after discontinuation of the drug.

## CASE

A 63-year-old female patient was admitted to the family medicine outpatient clinic with complaints of her tongue burning as if she had been drinking hot coffee. The patient stated that the burning sensation was constant throughout the day and localized in the anterior two-thirds of the tongue and the lower lip.

She explained that her complaint started one month prior to being admitted and added that she had never had such an issue before. In the vital findings of the patient, whose general condition was good, oriented, and cooperative, she had a fever of 36.5° C, arterial blood pressure of 120/70 mmHg, pulse of 90 beats/min, respiratory rate of 18/min and oxygen saturation of 99% in the room air.

There were no significant features in her family history. However, her medical history revealed that ramipril 5 mg tablet had been issued for hypertension approximately one month prior to her admission to the clinic. She did not smoke or consume alcohol. In the oral examination, it was determined that there were no mucosal or dental lesions, and that patient had normal and healthy oral mucosa. There was also no sign of aphthous or tumoral lesion on the tongue. Other physical examination findings were normal. The patient's mood was also normal; she had no history of mood disorders. There was no correlation to any gastrointestinal or other systemic disease. The laboratory results of the patient are presented in Table 1. A real-time reverse-transcription polymerase chain reaction (RT-PCR) test for COVID-19 came back negative.

After excluding all possible causes of burning mouth syndrome, we stopped ramipril, suspecting that the present symptoms might be a side effect of the ACEI, and changed the drug to a beta-blocker. After three weeks, her symptoms improved, taste perception returned to normal, and the burning sensation ceased. As of her latest follow-up, the patient's oral mucosa and tongue appeared normal and she was not experiencing any oral symptoms. No evidence of an underlying medical disorder was detected.

**Table 1:** Patient's Laboratory Examination Results

| | |
|---|---|
| White Blood Cell (WBC) | 6.7 (4.60-10.20) K/uL |
| Hemoglobin | 13.8 (12.20-18.10) g/dl |
| Mean Corpuscular Volume (MCV) | 92.4 (80- 100) Fl |
| Lymphocyte (LYM) | 3.01 (0.60-3.40) K/uL |
| Eosinophil (EOS) | 0.4 (0.0-0.7) K/uL |
| Platelet (PLT) | 285000 (100000-450000) K/uL |
| Glucose | 87 (74-118) mg/dL |
| Sodium (Na) | 141 (136-146) mmol/L |
| Potassium (K) | 4.2 (3.5-5.1) mmol/L |
| Calcium (Ca) | 9.4 (8 .8-10.6) mg/dL |
| Urea | 26 (17-43) mg/dL |
| Creatinine | 0.7 (0.67-1.17) mg/dL |
| D-dimer | 50 (0-500) ) µg FEU/L |
| C-reactive protein (CRP) | 3.6 (0-5) mg/dL |
| Iron (Fe) | 107 (37-158) µg/dL |
| Ferritin | 78 (4.63-204) ) ug/L |
| Thyroid Stimulating Hormone (TSH) | 2.18 (0.35-4.94) uIU/mL |
| Free T4 | 1.03 (0.7-1.48) ng/dL |
| Vitamin B12 | 480 (187-883) pg/mL |
| 25-Hydroxy vitamin D | 40.2 ng/mL |
| Magnesium | 2.2 (1.9-2.5) mg/dL |
| HgA1c | 4.7 (4-6) % NGSP |
| Folate | 5.9 (3.1-20.5) ng/mL |

According to the Adverse Drug Reaction Probability Scale (Naranjo Algorithm), her score was 6 and classified as probable (4).

## DISCUSSION

BMS has been defined as a chronic neuropathic intraoral pain condition. A number of etiologies have been reported to elucidate the clinical situation of burning mouth syndrome. These reported etiologies include personality and mood changes (anxiety and depression), concurrent health conditions and chronic pain conditions, headaches and pain in other locations, nutritional deficiencies, hormonal changes, and medications (5). While all these factors can be counted as causes, BMS is a diagnosis of exclusion. If the patient is experiencing these symptoms due to a medication, the best way to treat it is to change the medication for hypertension and follow-up (6).

Studies have shown that various neuropathic mechanisms act at different neuraxial levels and contribute to the pathophysiology of BMS. In tongue biopsy studies, it has been shown that BMS is caused by trigeminal small fiber sensory neuropathy (7). Presynaptic nigrostriatal dopaminergic pathway dysfunction has been reported to contribute to chronic pain in BMS. In immunohistochemical studies of biopsy samples taken from the tongues of BMS patients, a significant correlation was found between the pain score and heat and capsaicin receptor, transient receptor potential vanilloid 1 (TRPV1), as well as regulatory nerve growth factor (8). On the other hand, ACEI block hydrolysis of bradykinin by inhibiting desensitization of the receptor and potentiate the action of bradykinin (9). Katanosaka et al. reported that TRPV1 is a possible target ion channel activated indirectly by bradykinin. This study also showed that TRPV1 plays a role in bradykinin-evoked nociception (10). These prominent nociceptive complaints in the current case may have occurred as a result of the increased bradykinin level and TRPV1 effect after ACEI use.

Obara et al. reported that a 53-year-old female patient complained of burning mouth syndrome after using the ACE inhibitor captopril for the treatment of hypertension (6). Castells et al. stated in their study that the medication which causes burning symptoms and dysgeusia is an angiotensin receptor antagonist eprosartan (11). Boras et al. alluded to the connection between burning mouth symptoms and antihypertensives (ACE inhibitors and rarely angiotensin II receptor antagonists) in their report, describing how a 74-year-old female patient started to have complaints of a burning tongue one year after first using ramipril. These complaints disappeared when the medication was changed (12). Similar to the current case, the symptoms of all these patients regressed after the change of medication.

## CONCLUSION

The clinical status of patients presented with symptoms of burning mouth syndrome and the medication they use should be reviewed. These complaints should inform clinicians when they prescribe treatments for patients with hypertension that involve ACEI. Physiological and histological studies are needed to elucidate the pathogenesis of BMS.

**Conflict of interest:** Authors declare no conflict of interest.
**Ethic:** Informed consent was obtained from the patient.
**Approval of final manuscript:** All authors

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# Giant Traumatic Parafalcine Subdural Hematoma

Dev Travmatik Parafalsin Subdural Hematom

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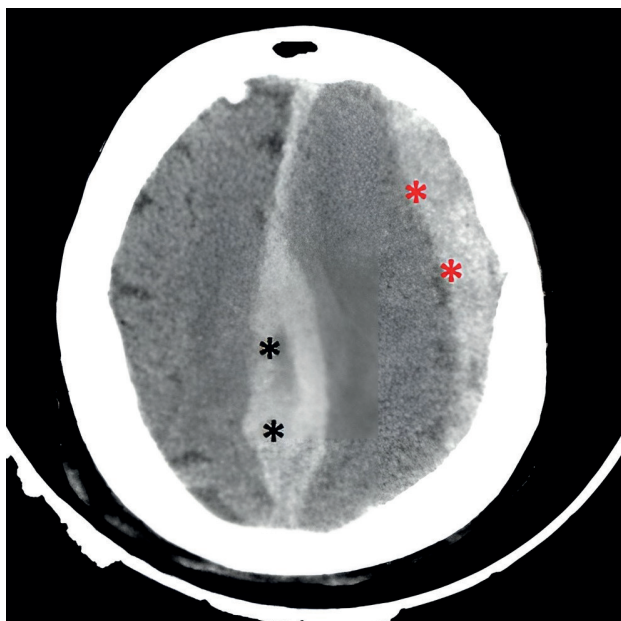
**Figure 1:** Preoperative computed tomography images of the patient. Acute subdural hematoma surrounding the cerebral convexity on the left, measuring 19 mm in its thickest part (red asterixis). Parafalcine subdural hematoma, measuring 19 mm in its thickest part (black asterixis).
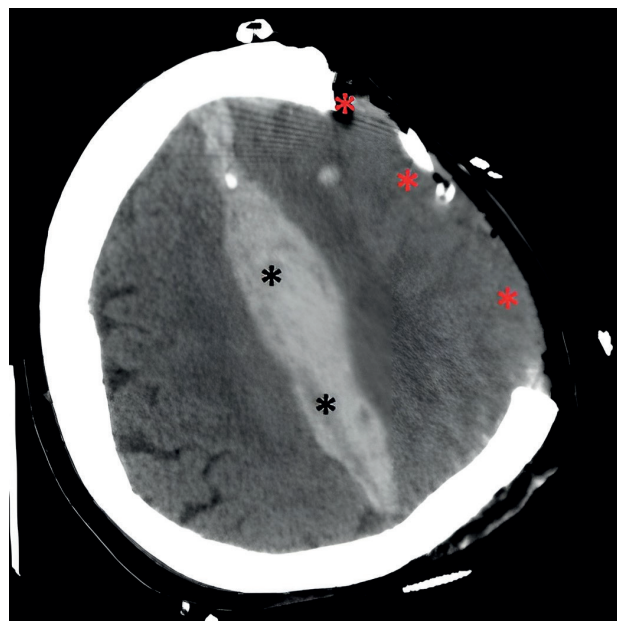


**Figure 2:** Postoperative computed tomography images of the patient. Craniectomy defect (red asterixis). Persisted parafalcine subdural hemorrhage (black asterixis).

A 77-year-old female patient was admitted to our clinic head injury from falling downstairs. It was learned from the anamnesis taken from the relatives that she had heart surgery 3 months ago and was using clopidogrel and metoprolol. On admission, blood pressure was 176/85 mmHg, and pulse rate was 75 /minute. On physical examination, her Glasgow Coma Score was 9 (eye 3, motor 3, verbal 3). There was subcutaneous emphysema, especially on the left side of the scalp. The patient had anisocoria, the left pupil diameter was larger than the right. Hematological, biochemical and coagulation parameters of the patient were within normal limits.

Computed tomography showed an acute subdural hematoma surrounding the cerebral convexity on the left, measuring 19 mm in its thickest part, and measuring 19 mm in the parafalcine region. The cerebral parenchyma was compressed and a slight shift to the right in the midline was observed (Figure 1). Emergency decompressive craniectomy was performed. In the postoperative computerized tomography, the compression of the parenchyma was decreased, and the parafalcine subdural hemorrhage persisted (Figure 2). The patient admitted to the intensive care unit and died on the 3rd day of admission to the intensive care unit.

Parafalcine subdural hemorrhage was first described by Arring and Evans in 1940 as an atypical localization (1). On the other hand, it has become more recognized due to the widespread availability of computed tomography since that day (2). Hemorrhages in the parafalcine region constitute 9-15% of all blunt trauma-induced intracranial hemorrhages (3). Although small amounts of parafalcine hemorrhages are benign, mortality is high in hemorrhages with high volume bleeding and high convexity (2,3).

**Conflict of interest:** Authors declare no conflict of interest.
**Ethic:** Informed consent was obtained from the patient.
**Approval of final manuscript:** All authors

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# Pandemide Artan Akut Ekstremite İskemisinin Farkında mıyız?

Are we Aware of the Increasing Acute Limb Ischemia on the Pandemic?

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**Sayın Editör,**

Derginizde yayınlanan Göçgün ve İkizceli'nin 2021 yılında derginizde yayınlanan 'COVID-19 ile İlişkili İskemik İnmenin Görüntüleme Bulguları' isimli makalesini (1) ilgiyle okudum. Yazarlar bu makalede, COVID-19'un iskemik komplikasyonu olan akut iskemik serebrovasküler olaya değinmiştir. Bu yazıda ise, bir diğer iskemik komplikasyon olan akut ekstremite iskemisi (AEİ) konusunda değinilmek istendi.

Coronavirus hastalığı-2019 (COVID-19), küresel pandemiye neden olan, başlangıçta sadece bir solunum yolu enfeksiyonu olduğu düşünülen bir enfeksiyon iken, artan vaka sayıları ile hastalığın pıhtılaşma bozukluğuna neden olduğu da anlaşılmıştır (2,3). COVID-19 hem arteryal hem de venöz tromboembolik komplikasyonlara neden olmuştur (1,3). Bu komplikasyonlar arasında yer alan AEİ ile ilgili veri sınırlıdır. Bu çalışmasında literatürü, AEİ açısından gözden geçirmeyi amaçladık.

İtalya'dan 2020 yılında yayınlanan bir çalışmada, İtalyan Lombardiya bölgesindeki COVID-19 pandemisi sırasında AEİ insidansı önemli ölçüde arttığı bildirilmiştir (3). Bildirilen AEİ vakalarının çoğu alt ekstremitede iken, bir kısmı da üst ekstremite yerleşimlidir. Bu olgulardan bazılarında antikoagülan tedaviye rağmen ampütasyon gerekmiştir (4,5).

Ülkemizden yayınlanan bir çalışmada (6), hastanede yatan COVID-19 tanılı toplam 681 hasta arasından, medyan yaşı 62 olan 6 (%0.9) hastada AEİ geliştiği ve bu hastaların tümünün düşük moleküler ağırlıklı heparin (DMAH) tedavisi aldığı bildirilmişti. COVID-19 tanısı ile AEİ semptom başlangıcı arasındaki medyan süre 13 gündü. Üç hastaya sistemik antikoagülasyonla birlikte acil cerrahi trombektomi uygulanmıştı ve üç hastaya da tek başına

sistemik antikoagülasyon uygulanmıştı. İki hasta exitus olmuştu. Hayatta kalanlar arasında bir hastaya iki taraflı majör amputasyon uygulanmıştı ve diğer hastaya hastaneden taburcu olduktan sonraki bir ay içinde minör amputasyon uygulanmıştı. AEİ olan sadece iki hasta sekelsiz düzelmişti (6).

Başarılı revaskülarizasyon incelenen makalelerde beklenenden daha düşüktü, bunun virüsle ilişkili hiper pıhtılaşma durumundan kaynaklandığını düşünmekteyiz. AEİ'de uzamış sistemik heparin kullanımı cerrahi tedavi etkinliğini, uzuv kurtarmayı ve genel sağkalımı iyileştirebilir (5,6).

Özetle bu yazı, COVID-19 hastalarında optimal antikoagülan tedaviye duyulan ihtiyacı ve olası COVID-19 ile tromboembolik olaylar ilişkili sekel hakkında sürekli bir farkındalığın ve araştırmaların sürdürülmesi gerektiğini vurgulamaktadır.

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