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ARAŞTIRMA MAKALESİ / *RESEARCH ARTICLE*

Is Cold Weather Testicle's Friend or Foe?

Soğuk Hava Testisin Dostu mu Düşmanı mı?

Erdem Özatman[1], Rifat Burak Ergül[2], Reşat Aydın[2], Muhammet İrfan Dönmez[1], Tayfun Oktar[1], Orhan Ziylan[1], İsmet Nane[2]

[1]Istanbul University, Istanbul Faculty of Medicine, Division of Pediatric Urology, Department of Urology, Istanbul, Türkiye
[2]Istanbul University, Istanbul Faculty of Medicine, Department of Urology, Istanbul, Türkiye

ORCID ID: E.Ö. 0000-0002-9405-3597; R.B.E. 0000-0001-6262-9582; R.A. 0000-0002-1581-8476; M.İ.D. 0000-0002-2828-7942; T.O. 0000-0001-7719-2440; O.Z. 0000-0001-9900-9301; İ.N. 0000-0002-5079-1221

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ABSTRACT

Objective: Low air temperature has been shown to predispose testicular torsion (TT). In this study, we aimed to examine the relationship of TT occurrence with monthly average temperature.

Materials and Methods: The files of 75 male patients who were admitted with acute scrotum between 2005 and 2021 and underwent intervention with a preliminary diagnosis of TT after examination were retrospectively analyzed. The mean age, date of admission, torsion side and interventions were recorded. All patients underwent scrotal doppler ultrasonography. Further, monthly average temperature values of the given years for the province were obtained from the General Directorate of Meteorology. Months were ranked in descending order in terms of average monthly temperature and divided into two groups as warmer and colder months.

Results: The mean age of the patients at the time of intervention was 17.02±0.78 years. TT was seen on the right side in 49(67.1%) patients, left side in 23(31.5%) and bilateral in 1(1.4%) patient. Two (2.6%) patients turned out not to have TT and were excluded from the study. The warm months were those from April to September, and the cold months from October to March. It was determined that testicular torsion developed in 41 (56.2%) patients in the warm months and in 32 (43.8%) patients in the cold months. Detorsion and fixation were performed in 50(68.5%) of the patients, orchiectomy in18 (24.6%) and manual detorsion preceded by fixation in another session in 5 (6.9%) patients.

Conclusion: Our results indicated that TT may be observed more frequently in warm months. Thus, TT might not be related to seasonal temperature changes.

Keywords: temperature, seasonal variations, spermatic cord torsion, testis, testicular torsion

ÖZ

Amaç: Testis torsiyonu (TT), testis ve spermatik kordun ekseni etrafında dönüşü ile karakterize akut skrotal ağrıya neden olan acil bir ürolojik patolojidir. Düşük hava sıcaklığının predispozan etkisini gösteren çalışmalar mevcuttur. Bu çalışmada TT'nin soğuk hava ile olan ilişkisinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: 2005-2021 yılları arasında İstanbul Üniversitesi İstanbul Tıp Fakültesi Üroloji AD Çocuk Ürolojisi BD'na skrotal ağrıyla başvurup, muayene ve skrotal doppler ultrasonografi sonrası TT ön tanısıyla cerrahi eksplorasyon yapılan 75 erkek hastanın dosyası geriye dönük incelendi. Hastaların yaş ortalaması, başvuru tarihi, torsiyon tarafı ve yapılan girişimler kaydedildi. Meteoroloji Genel Müdürlüğü'nden İstanbul ili için son 16 yılın aylık ortalama hava sıcaklığı değerleri alındı. Ortalama hava sıcaklığının en yüksek olduğu aydan en düşük olduğu aya doğru sıralama yapıldı. Sıcak ve soğuk aylar olarak iki gruba ayrıldı.

Bulgular: Hastalar cerrahi eksplorasyon esnasında ortalama 17.02 ± 0.78 yaşındaydı. Sağ testis torsiyonu 49 (%67,1), sol testis torsiyonu 23 (%31,5), bilateral torsiyon ise 1 (%1,4) hastada görüldü. Eksplore edilen hastaların 2'sinde ise (%2,6) TT olmadığı saptandı ve bu hastalar çalışma dışı bırakıldı. Tüm olgularda intravaginal torsiyon vardı. Hastaların aylara göre dağılımı ve ayların ortalama sıcaklık değerleri Şekil 1'de gösterilmiştir. Son 16 yılın ortalama hava sıcaklığı Ağustos'ta 26,0°C ile en yüksek, Ocak'ta 6,9°C ile en düşüktü. Nisan - Eylül arası sıcak aylar, Ekim - Mart arası ise soğuk aylar olarak adlandırıldı. Sıcak ayların ortalama sıcaklığı 21,8°C iken, soğuk aylarınki 10,2°C idi. Sıcak aylarda 41 (%56,2), soğuk aylarda 32 (%43,8) hastada testis torsiyonu geliştiği saptandı. Hastaların 50'sine (%68,5) detorsiyon ve fiksasyon, 18'ine (%24,6) orşiektomi, 5'ine (%6,9) manuel detorsiyon yapıldı. Detorsiyon ve fiksasyon yapılan 6 (%8,2) hastada kontralateral orşiektomi geçmişi vardı

Sonuç: Çalışmamızda literatürdeki düşük sıcaklıkta TT insidansının arttığına yönelik bilginin tersi ortaya konmuştur. Sıcaklığın yüksek olduğu 6 ayda TT nedeniyle başvurular daha fazladır. Ayrıca yaz tatilinde çocukların şehir dışına seyahat ettiği varsayılarak, sıcak aylarda hasta sayısının daha fazla olabileceği öngörülmüştür. Farklı bölgelerden çok merkezli çalışmalara ihtiyaç duyulmaktadır.

Anahtar Kelimeler: sıcaklık, mevsimsel değişimler, spermatik kord torsiyonu, testis, testis torsiyonu

Corresponding Author/Sorumlu Yazar: Rifat Burak Ergül **E-mail:** rifat-ergul@hotmail.com

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INTRODUCTION

Testicular torsion (TT) is a urological emergency characterized by the rotation of the testis and spermatic cord around its axis that presents as acute scrotal pain. (1) In TT, delayed intervention may result in organ loss whereas testis can be preserved up to 90% when detorsion is performed within the first 6 hours after the onset of symptoms. However, testicular survival decreases down to 50% and 10%, when the intervention is carried out at the 12th and 24th hours, respectively. (1,2,3)

The etiology of testicular torsion is not understood well, but there are determined risk factors for its occurrence. Age is a very important risk factor as approximately 61% of patients presenting with testicular torsion are under the age of 21. (1,3) Other factors that were reported to be plausible for testicular torsion are a rapid increase in testicular volume with puberty, history of undescended testis, presence of a testicular tumor, large horizontal axis of testis and a long intrascrotal spermatic cord. (4,5) On the other hand, post-traumatic testicular torsion was reported in 4-8% of the patients. (3,6) Another factor that has been expressed in many studies is the hyperactive cremaster reflex in cold weather. (2,7) Some studies conducted in various countries investigated the seasonal prevalence of testicular torsion, its relationship with humidity, and daily temperature changes to prove this hypothesis. (2,7,8) They showed that cold weather played a role in contraction of dartos muscle leading to an increase in the frequency of TT in colder months.

Our observations for a long time were inconsistent with the previously published studies indicating a higher incidence in warmer months. Thus, we hypothesized that TT has no relationship with seasonal temperature changes. Subsequently, this study was carried out to investigate the relationship between testicular torsion and weather temperature in Istanbul, the mostly populated city in Turkey (15,636,405 people as per 2020).

MATERIAL AND METHODS

The files of 75 male patients who applied to our department with scrotal pain and underwent surgical exploration with the preliminary diagnosis of testicular torsion were retrospectively analyzed. All patients were taken into an operating room after examination and scrotal doppler ultrasonography. The mean age, admission date, torsion side and interventions of the patients were recorded.

The monthly average air temperature values of related years for the province of Istanbul were obtained from the General Directorate of Meteorology. Then, months were sorted according to the average temperature from the highest to the lowest. Then, months were divided into two groups as warmer and colder months accordingly.

Briefly, the surgical technique included a 2cm transverse incision on the affected side scrotum skin, then the testis and tunica albuginea were reached by blunt and sharp dissections.

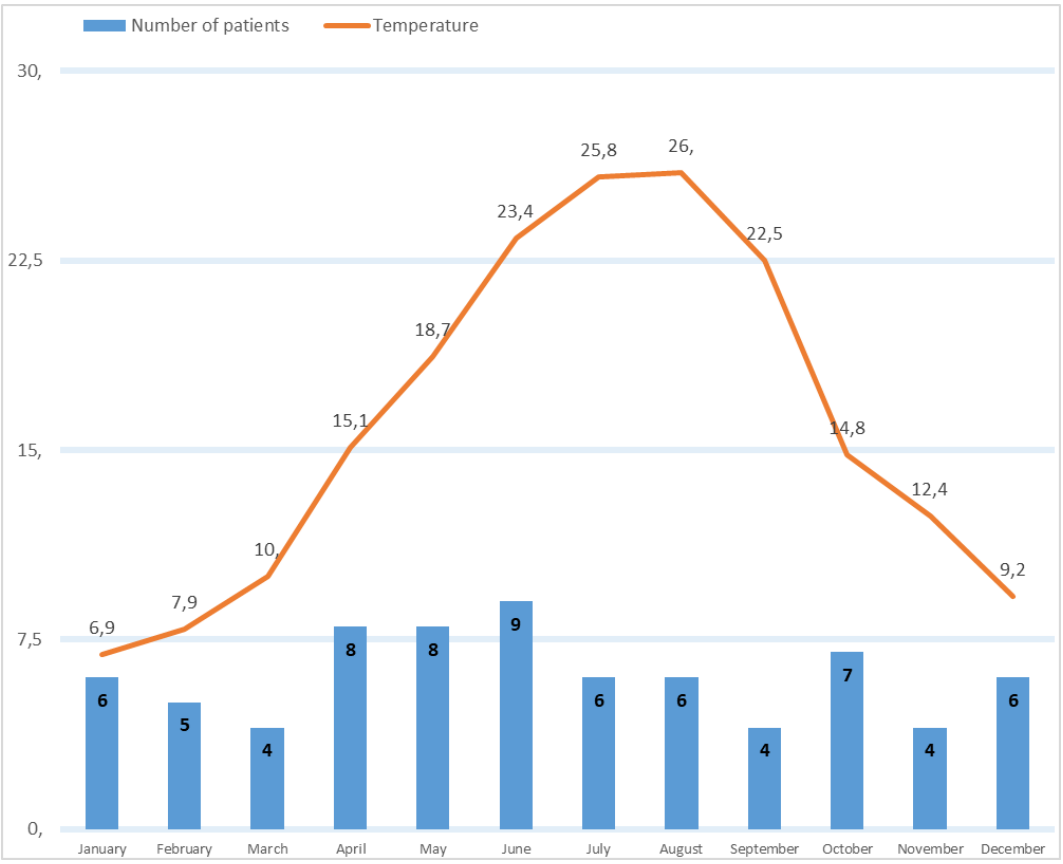

Figure 1. Average air temperature and number of testicular torsion cases by months of the last 16 years

Data on the color of testis, presence of edema, epididymis status, presence of Bell Clapper deformity, and the degree of torsion were recorded. After detorsion of the testis and cord, a warm compress was applied for 8-10 minutes and then left. (9) If no color change to normal was observed and testis was engorged, a 1cm vertical incision was made on the testicular capsule and a tunica vaginalis flap was applied. The testicles, whose blood supply was preserved after detorsion were fixed to the dartos pouch from 3 different points with 4/0 rapid vicryl. Orchiectomy was performed on testes that had no blood flow and lost their vitality after using the previously explained maneuvers. In all cases, contralateral testicular fixation was performed.

RESULTS

The mean age of the patients was 17.02 ± 0.78 years at the time of surgical exploration. Right testicular torsion was seen in 49 (67.1%), left testicular torsion in 23 (31.5%) and bilateral torsion in 1 (1.4%) patient. Two (2.6%) of the explorations did not reveal testicular torsion and these patients were excluded from the study. All cases had intravaginal torsion.

The distribution of the patients according to the months and the average temperature values of the months are shown in Figure 1. The average air temperature of the last 16 years was the highest in August (26.0°C) and the lowest in January (6.9°C). April to September were called the warmer months, and October to March were categorized as the colder months. While the average temperature of the warmer months was 21.8°C, it was 10.2°C in the colder months. We determined that testicular torsion developed in 41 (56.2%) patients in warmer months while in 32 (43.8%) patients in colder months. Furthermore, during the pandemic, testicular torsion was seen in 5 (6.8%) patients. Of these patients, 3 (4.1%) were in May, 1 (1.3%) in June, and 1 (1.3%) in March.

Detorsion was performed in 50 (68.5%) of the patients, orchiectomy in 18 (24.6%) and manual detorsion followed by surgical exploration in 5 (6.9%) patients. In the bilateral case, manual detorsion was performed twice within 5 years in other centers, and then detorsion and fixation was performed in our center. Six (8.2%) patients who underwent detorsion and fixation had a history of contralateral orchiectomy.

DISCUSSION

Testicular torsion can cause testicular loss if not treated urgently, further resulting in low testosterone levels, decreased sperm count and decreased fertility. (10,11) Previous studies hypothesized that cold air triggered testicular hyperactivity by stimulating the capsule of cremasteric muscle and dartos, then the testis was enforced to a reflex movement. (10,11,12) In this way, it was thought that the testis was pulled upwards and rotated around its own axis due to contraction of the cremaster muscle. (12) Our results showed a contrary outcome to previous findings of this information about the occurrence of testicular torsion at low temperatures. (2,7,8,10,12) It was observed that the number of testicular torsion cases was higher in the 6 warmer months when the average temperature was higher.

However, it should be noted that the coldest average air temperature (19.4°C) in the study by Korkes et al. (year?) corresponds to the warmer months in our study. Besides, the factors known to affect TT such as trauma, tumor, previous surgery was not mentioned in the study conducted in New York, USA. In another study that indicated a higher TT rate in winter, exclusion criteria were not mentioned, in addition to a lack of a negative exploration rate and scrotal Doppler USG results. (12) In the study which evaluated national orchiectomy outcomes in the USA including 2876 patients, Cost et al. (year?) stated that testicular torsion did not show any seasonal preponderance whereas orchiectomy was more commonly performed on children aged between 1 and 9. They also found that ethnicity played a role on requirement of orchiectomy whereas it is not certain if this is a racial predisposition or a difficulty in healthcare access. (10) On the contrary, a study from Japan analyzed the data of 39 patients with testicular torsion and determined that the frequency of the disease increased below 15°C, which is the mean air temperature in their study. (13)

Moreover, Preshaw (year?) reviewed 272 TT cases and found no seasonal peak in the incidence for the six coldest months in Canada or any 6-month sequential period. (14) Similarly, a study from Nigeria investigating 131 confirmed TT cases found no statistically significant variance in the incidence of testicular torsion between the warm and cold months. (15) The findings of our study showed seasonal preponderance for testicular torsion is contrary to what is stated in several articles.

On the other hand, during the summer vacation, families of school age children usually travel to their home towns or summer holidays for longer periods. Thus, reducing the number of children in the city. Although there are more children in Istanbul during the colder months, more TT cases were encountered in the warmer months in our study. For this reason, we assume that even more patients might have been observed in the warmer months, especially in the summer. Last but not the least, contralateral testicular fixation is not reported in many of the studies above, we strongly suggest contralateral fixation in testicular torsion due to the increased risk of TT in the future.

There are some limitations to our study. First of all, our study includes all the limitations due to a retrospective design. A relatively small number of patients are included. Also, a study based on the air temperature values at the time of the patient's complaints might give a clearer overview of the effect of temperature rather than average. Further, there are of course, temperature variations during the day both in winter and summer. (16) A study based on the air temperature values at the time of the patient's complaints might give a clearer overview of the effect of temperature rather than average. (17) It would be appropriate to evaluate the application hours of patients who underwent orchiectomy individually.

CONCLUSION

Contrary to what has previously been published, the fact that cold air is a predisposing factor in testicular torsion was not supported in our study. Thus, we conclude that TT has no relationship with seasonal temperature changes. However, multicenter studies from different regions will enhance our knowledge on the relationship between testicular torsion and weather.

Ethics Committee Approval: This study was approved by the ethics committee of İstanbul University, Faculty of Medicine. (17/05/2021 - 5).

Informed Consent: Informed consent was not obtained as it was a retrospective study.

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- E.Ö., İ.N., H.O.Z.; Data Acquisition- R.E.B., M.İ.D., T.M.O.; Data Analysis/Interpretation- R.A., R.E.B.; Drafting Manuscript- R.E.B., E.Ö., T.M.O., İ.N.; Critical Revision of Manuscript- R.A., M.İ.D., H.O.Z.; Final Approval and Accountability- E.O., R.B.E., R.A., M.İ.D., T..O, O.Z., İ.N.

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