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Thesis: Erakinci G. Searching for antibodies against parasites in donors. Izmir: Ege University Health Sciences Institute. 1997.

Electronic format: Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis (serial online) l995 Jan-Mar (cited 1996 June 5): 1(1): (24 screens). Available from: URL: http:/ www.cdc.gov/ncidodlElD/cid.htm.

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Methods

Results

Discussion

Conclusion

Acknowledgement

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Title

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Keywords

Introduction

Case report

Discussion

Conclusion

Acknowledgement

References (up to 20)

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Keywords

Introduction

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Acknowledgement

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CONTENTS

EDITORIAL

Starting the year 2023

Although 82 days have passed since the February 6 earthquake, we are still in pain of what we lost. We also commemorate the people we lost while working to continue our daily lives and our faculty members who left us. We published our magazine with these sad feelings. We would like to thank all the researchers who contributed to the published issue of our journal.

Hope to meet you in new issues...

PhD, Assoc. Prof. Ülkü KARAMAN

Editor

ODU TIP DERGİSİ/ODU MEDICAL JOURNAL (ODU MED J) **April 2023;10(1):1-7**

ARAŞTIRMA MAKALESİ/ RESEARCH ARTİCLE **DOI:** 10.56941/odutip.1273205

The Relationship between Recurrent Hospitalization and Inflammation in Heart Failure Patients

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Abstract

Objective: In this study, we aimed to show whether there is a relationship between inflammatory markers and recurrent hospitalizations within 1 year in patients with heart failure.

Methods: All patients over the age of 18 who were followed up with a diagnosis of heart failure in the cardiology outpatient clinic between 2020-2021 were included in the study. The files of the patients were scanned and their sociodemographic characteristics, hemogram and biochemical parameters were recorded. Platelet lymphocyte ratio (P/L), neutrophil lymphocyte ratio (N/L), monocyte HDL (monocyte/HDL) ratios were calculated from inflammatory markers. It was screened how many times the patients were hospitalized and followed up in the hospital in the last year. The correlation between the number of hospitalizations and inflammatory markers were evaluated.

Results: 483 patients were included in the study. The mean age of the patients was 65.65±11.75 years. The mean ejection fraction of the patients was found to be 29.53±6.102% (minimum 15 and maximum 45). CRP=8.01±9.29, monocyte HDL ratio=0.0172±0.010, platelet-lymphocyte ratio=149.24±88.80, neutrophil-lymphocyte ratio=4.54±4.88.It was determined that 73 (15.1%) of the patients had recurrent hospitalizations within one year. A significant positive correlation was found between recurrent hospitalizations and monocyte HDL ratio (r= 0.123, p=0.007), but no significant correlation was found with other parameters.

Conclusion: A significant positive correlation was found between recurrent hospitalizations and only monocyte HDL ratio. No significant correlation was found between other inflammatory markers. Larger studies with a large number of cases are needed to evaluate the relationship between recurrent hospitalization and inflammation.

Key Words: Heart failure, recurrent hospitalization, inflammatory markers.

Kalp Yetmezliği Hastalarında Mükerrer Yatış ile İnflemasyon arasındaki İlişki

Özet

Amaç: Bu çalışmada kalp yetmezliği olan hastalarda inflematuar belirteçler ile bir yıl içinde tekrarlayan hastaneye yatışlar arasında ilişki olup olmadığını göstermeyi amaçladık.

Metod: 2020-2021 tarihleri arasında kardiyoloji polikliniğinde kalp yetmezliği tanısı ile takip edilen 18 yaş üstü tüm hastalar çalışmaya dahil edildi. Hastaların dosyaları taranarak sosyodemografik özellikleri, hemogram ve biyokimyasal parametreleri kaydedildi. İnflematuar belirteçlerden platelet lenfosit oranı (P/L), nötrofil lenfosit oranı (N/L), monosit HDL (monosit/HDL) oranları hesaplandı. Hastaların son bir yıl içinde kaç defa yatırılarak hastanede takip edildikleri tarandı. Hastaneye yatış sayısı ile inflematuar belirteçler arasındaki korelasyon değerlendirildi.

Bulgular: Çalışmaya 483 hasta dahil edilmiştir. Hastaların yaş ortalaması 65.65±11.75 yıl idi. Hastaların ejeksiyon fraksiyonu ortalama % 29.53±6.102 (minimum 15 maksimum 45) olarak bulundu. CRP=8.01±9.29, monosit HDL oranı=0.0172±0.010, platelet lenfosit oranı=149.24±88.80, nötrofil lenfosit oranı=4.54±4.88 olarak bulundu. Hastaların 73 (%15,1) nün bir yıl içinde hastaneye tekrarlayan yatışları olduğu tespit edildi. tekrarlayan hastaneye yatışlar ile monosit HDL oranı arasında anlamlı pozitif korelasyon bulundu (r= 0.123, p=0.007), diğer parametreler ile anlamlı bir korelasyon bulunamadı.

Sonuç: Tekrarlayan hastaneye yatışlar ile sadece monosit HDL oranı arasında anlamlı pozitif korelasyon bulundu. Diğer inflematuar belirteçler arasında anlamlı bir korelasyon bulunamadı. Tekrarlayan yatış ile inflemasyon arasındaki ilişkiyi değerlendirmek için vaka sayısının fazla olduğu daha büyük çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Kalp yetmezliği, tekrarlayan hastaneye yatış, inflematuar belirteçler

Suggested Citation: Kaya Y, Kaya A, Akkaya F, Filiz M. The relationship between recurrent hospitalization and inflammation in heart failure patients. ODU Med J, 2023;10(1): 1-7

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INTRODUCTION

Heart failure (HF) is defined as a disease associated with heart tissue damage caused by systemic inflammation, arrhythmia, and conduction defects (1).In recent years, survival has increased in patients with acute myocardial infarction due to the improvement of early coronary reperfusion strategies and coronary care. However, the increased survival rate in heart attack patients resulted in an increased rate of heart failure (2). Despite advances in medical and interventional treatments, the risk of heart failure following myocardial infarction is still high (3). Heart failure is among the important causes of morbidity and mortality. With the successful treatment of myocardial infarction and the increasing elderly population, the incidence of chronic diseases such as HF is increasing rapidly. The increase in heart failure causes increased health costs (4).

In the literature, it is stated that chronic activation of the immune system plays a central role in the occurrence and progression of HF with reduced ejection fraction and HF with preserved ejection fraction (5). It has been shown that there is a correlation between inflammation and adverse cardiovascular events in patients with HF, and inflammation plays a prominent role in both acute and chronic heart failure (1). It has been reported in publications that neutrophil-lymphocyte ratio (NLR) is associated with prognosis in many cardiac diseases such as heart failure, arrhythmia, and valve disease, especially ischemic heart disease (6). It has also been shown in studies that the platelet lymphocyte ratio (PLR), which is also an inflammatory marker, predicts mortality in patients with acute heart failure (7). An association between high monocyte count and low HDL-C levels has been reported in inflammatory disorders. (8)

In this study, we aimed to show whether there is a relationship between inflammatory markers and recurrent hospitalizations within one year in patients with HF.

METHODS

Heart failure is a complex clinical syndrome caused by structural or functional changes affecting the filling and/or ejection capacity of the ventricle. All patients over the age of 18 who were followed up with a diagnosis of heart

failure, with low ejection fraction (EF≤45) in the cardiology outpatient clinic between 2020-2021 will be included in the study. The files of the patients were scanned and their sociodemographic characteristics, ECG rhythms, New York Heart Association (NYHA) classifications, hemogram and biochemical parameters were recorded. Platelet lymphocyte ratio= Platelet/lymphocyte, neutrophil lymphocyte ratio= neutrophil/ lymphocyte, monocyte HDL ratio= monocyte / HDL were used as inflammatory markers. The number of hospitalizations of the patients in the last year was screened. The endpoint variable for this study was the number of hospitalizations per year. Data were obtained from hospital records. The correlation between the number of hospitalizations and inflammatory markers was evaluated.

Statistical analysis

All statistical analyzes required in the study were performed using the SPSS v25 (IBM Inc., Chicago, IL, USA) statistical program. Data were evaluated for normality with the Kolmogorov-Smirnov test. Pearson correlation test was used for normally distributed data and Spearman correlation test was used for non-normally distributed data to evaluate whether there was a correlation between inflammatory markers and the number of hospitalizations in 1 year. The mean±standard deviation, minimum and maximum values were used for numerical data in the evaluation of the data of the patients. It was evaluated as % in categorical data.

RESULTS

483 patients were included in the study. The mean age of the patients was 65.65±11.75 years. The mean ejection fraction of the patients was 29.53±6.102 (minimum 15, maximum 45) (table 1). 35.2% of the patients were female, 64.8% were male, 30.4% had DM, 50.5% had HT, 17% had hyperlipidemia, and 13.3% had chronic kidney disease. In the ECG of the patients, 47% of the patients had atrial fibrillation and 53% of them sinus rhythm. NYHA-1 was found in 138 (28.6%), NYHA-2 in 186 (38.5%), NYHA in 140 (29%) 3.19 (4%) NYHA 4 (table 2).

CRP= 8.01±9.29, monocyte HDL ratio= 0.0172±0.010, platelet-lymphocyte ratio= 149.24±88.80, neutrophil-lymphocyte ratio= 4.54±4.88 (table 1). It was determined that 73 (15.1%) of the patients had recurrent hospitalizations in the last year (table 2). As a result of the correlation between recurrent hospitalizations and monocyte HDL ratio, platelet lymphocyte ratio, neutrophil lymphocyte ratio and CRP, a significant positive correlation was found between recurrent hospitalizations and monocyte HDL ratio (r= 0.123, p=0.007), no significant correlation was found with other parameters (table 3).

Table 1 Age, ejection fraction, biochemical and hemogram parameters of the patients

	Minimum	Maximum	Mean	Standard. Deviation
Age, years	26	95	65.65	11.751
C reactive protein, mg/L	.06	73.00	8.0133	9.29417
Fasting blood sugar, mg/dl	41.00	536.00	115.0508	47.95302
URE, mg/dl	6	236	42.14	27.783
Creatinine, mg/dl	0.42	34.00	1.2257	1.76741
Aspartate Aminotransferase, U/L	3	756	33.08	52.821
Alanine Aminotransferase, U/L	5	453	30.48	41.393
Total Cholesterol, mg/dl	87	407	187.95	45.739
HDL Cholesterol, mg/dl	16	79	40.27	11.947
LDL Cholesterol, mg/dl	11	2584	131.44	147.480
Triglyceride, mg/dl	17	1181	146.17	101.612
Uric acid, mg/dl	2.00	72.00	7.2817	8.96299
Ejection fraction, %	15	45	29.53	6.102
Brain natriuretic peptide, pg/ml	32.26	25800.00	3335.6631	3386.96229
Troponin, ng/mL	0.0010	38.7000	.209439	1.8909479
White blood cell, 10^3/µL	3.40	46.40	10.4899	5.36377
Thrombocyte, 10^9/L	10.40	781.00	216.4219	84.25364
Lymphocyte, 10^9/L	0.32	9.22	1.7449	0.96354
Monocytes, 10^9/L	0.10	2.80	.6419	0.34704
Neutrophil, 10^9/L	1.00	34.40	6.0529	4.71955
Monocyte HDL ratio	0.00	0.08	.0172	0.01049
Platelet lymphocyte ratio	4.95	752.50	149.2483	88.80542
Neutrophil lymphocyte ratio	0.22	30.00	4.5478	4.88772
Hemoglobin, g/dl	7.40	152.00	13.8590	6.74415

Table 2. Chronic diseases, ECG rhythms, NYHA classifications of patients

Gender, n(%)	
Female	170 (35.2)
Male	313 (64.8)
Diabetes Mellitus. n(%)	147 (30.4)
Hypertension. n(%)	244 (50.5)
Hyperlipidemia. n(%)	82 (17)
Chronic Kidney Disease. n(%)	64 (13.3)
Ecg Rhythm. n(%)	
Inüs	256 (53)
Atrial fibrillation	227(47)
NYHA Classification. n(%)	
1	138 (28.6)
2	186 (38.5)
3	140 (29)
4	19 (4)
Recurrent hospitalization. n(%)	73 (15.1)

Table 3 Correlation between repeated hospitalizations and inflammatory markers

	Repeated Hospitalizations	
	r	**p**
C reactive protein. mg/L	**0.079**	**0.083**
Monocyte HDL ratio	0.123	***0.007***
Platelet lymphocyte ratio	0.055	0.231
Neutrophil lymphocyte ratio	0.076	0.093

DISCUSSION

It was determined that 73 (15.1%) of the patients had recurrent hospitalizations in the last year. A significant positive correlation was found between recurrent hospitalizations and monocyte HDL ratio (r= 0.123. p=0.007). but no significant correlation was found with other parameters.

Inflammation is the body's physiological response to infections. injuries. and toxins. Inflammation is a beneficial response in the short term. but it is hypothesized that when the duration of inflammation is prolonged (due to diseases such as diabetes or obesity). it can have harmful effects (5). Both chronic low-grade inflammation and acute severe inflammation are involved in the pathogenesis of cardiovascular diseases (coronary artery disease and heart failure). Since chronic low-grade inflammation is usually caused by chronic diseases such as diabetes mellitus. hypertension. and obesity. it cannot be corrected (9). In acute inflammation in cardiovascular diseases. an inflammatory response occurs when spleen leukocytes move to the damaged heart as the first defense after myocardial infarction (10). Cardiac inflammation and subsequent tissue damage are regulated by the infiltration and activation of various immune cells into the myocardium. including neutrophils. monocytes. macrophages. eosinophils. mast cells. natural killer cells. and T and B cells. After tissue injury. monocytes and tissue-resident macrophages undergo significant phenotypic and functional changes and act as key regulators of tissue repair. regeneration. and fibrosis (1). At the same time. besides the activation of inflammatory cells and endothelial cells. the production of reactive oxygen species (ROS). eicosanoids and cytokine/chemokines increase (11). Physiological acute inflammation is essential for cardiac repair after injury. However. if inflammation is suboptimal. this leads to chronic inflammation and subsequently to advanced HF (10). It has been reported in publications that chronic systemic inflammation in the body is associated with an increased risk of heart failure (12).

Studies show that inflammatory mediators are important in cardiac remodeling and in the pathogenesis of chronic heart failure. Studies have reported that inflammatory cytokines such as tumor necrosis factor (TNF)α. interleukin (IL)-1β and IL-6 are elevated in the plasma and myocardial tissue of HF patients. There is strong evidence that these mediators are involved in processes that lead to cardiac remodeling. such as hypertrophy. fibrosis. and apoptosis. It is said that some of these cytokines can also provide useful prognostic information as reliable biomarkers in this disease (13). As a result of the study by Albar et al.. it was concluded that inflammatory biomarkers IL-6. TNF-α and CRP are associated with HF that occurs independently (12).

High-density lipoprotein-cholesterol (HDL-C) has an antiatherosclerotic effect by inhibiting the migration of macrophages and LDL oxidation. neutralizing the proinflammatory and prooxidant effects of monocytes. In addition. HDL plays a role in suppressing the activation of monocytes and the proliferation-differentiation of monocyte progenitor cells (14). Recent studies show that the monocyte HDL-C ratio (MHR). which is an easily calculated measure. may be a new indicator of inflammation (15).

CONCLUSION

As a result of this study. it was found that MHR. which was stated to be one of the inflammatory markers. showed a positive correlation with recurrent hospitalization in heart failure patients with acute and chronic inflammation in the physiopathology. No relationship was demonstrated with other inflammatory markers. Larger studies are needed to examine the relationship between recurrent hospitalization and inflammatory markers.

LIMITATIONS

Inadequate number of cases. being a single-center study. and inability to examine all inflammatory markers can be counted among the limitations.

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Green Synthesis of Silver Nanoparticles Using Saffron (*Crocus sativus*) Purple flower and Their Antimicrobial activity

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Abstract

Objective: In this research, CS-AgNPs were created, described, and their antibacterial activity assessed utilizing an inexpensive, simple, and ecologically friendly extraction approach from the waste saffron flower's purple flower parts.

Methods: : In this study, silver nanoparticles (AgNPs) were synthesized quickly, cheaply, and environmentally friendly utilizing purple flower extract from saffron (*Crocus sativus* (CS)). For the explanation of the structure of silver nanoparticles synthesized with saffron flower extract (CS-AgNPs); UV-visible (UV-vis.) Spectrophotometer, Fourier Scanning Electron Microscope (FE-SEM), Scanning Electron Microscope (SEM), Electron Distributed X-rays (EDX), Fourier Transform Infrared Spectroscopy (FT-IR), X-Ray Characterized using Diffraction Diffractrometer (XRD), Transmission Electron Microscope (TEM), Zeta potential data. It was discovered that the UV-visible spectrum of the biologically produced silver nanoparticles generated at a maximal wavelength of 405.68 nm in the spectrum collected after 15 minutes. Furthermore, it was noted that the synthesized nanoparticles' UV spectrum, taken a month later, revealed the same wavelength and that the resulting nanoparticles were stable. CS-AgNPs' antimicrobial effects against gram-positive, gram-negative, and fungal pathogens were assessed employing the minimum inhibition concentration approach.

Results: The generated CS-AgNPs were found to be active against both fungi and bacteria as a consequence.

Conclusion: It turned out that even at very low concentrations, the antimicrobial activity of silver nanoparticles enhanced with decreasing size and had high antibacterial and anticandidal implementation.

Key Words: *Crocus sativus* , CS-AgNPs, MIC, Antibacterial effect and Antifungal effect.

Safran (*Crocus sativus*) Mor Çiçekleri Kullanılarak Gümüş Nanopartiküllerin Yeşil Sentezi ve Antimikrobiyal Aktiviteleri

Özet

Amaç: Bu araştırmada, safran çiçeğinin mor çiçekleri parçalarından ucuz, basit ve çevre dostu bir ekstraksiyon yaklaşımı kullanılarak CS-AgNP'ler oluşturulmuş, tanımlanmış ve antibakteriyel aktiviteleri değerlendirilmiştir.

Metod: Bu çalışmada saffrondan (*Crocus sativus* (CS)) elde edilen mor çiçek özü kullanılarak gümüş nanoparçacıklar (AgNP'ler) hızlı, ucuz ve çevre dostu olarak sentezlendi. Safran çiçeği özü (CS-AgNPs) ile sentezlenen gümüş nanopartiküllerin yapısının açıklanması için; UV-görünür (UV-vis.) Spektrofotometre, Fourier Taramalı Elektron Mikroskobu (FE-SEM), Taramalı Elektron Mikroskobu (SEM), Elektron Dağıtılmış X-ışınları (EDX), Fourier Dönüşümlü Kızılötesi Spektroskopi (FT-IR), X-Ray Kırınım Kırınım Ölçer (XRD), Geçirgen Elektron Mikroskobu (TEM), Zeta potansiyel verileri kullanılarak karakterize edilmiştir. Biyolojik olarak üretilen gümüş nanopartiküllerin UV-görünür spektrumunun 15 dakika sonra toplanan spektrumda maksimum 405.68 nm dalga boyunda üretildiği keşfedildi. Ayrıca sentezlenen nanoparçacıkların bir ay sonra alınan UV spektrumunun aynı dalga boyunu ortaya çıkardığı ve ortaya çıkan nanoparçacıkların kararlı olduğu kaydedildi. CS-AgNP'lerin gram-pozitif, gram-negatif ve mantar patojenlerine karşı antimikrobiyal etkileri, minimum inhibisyon konsantrasyonu yaklaşımı kullanılarak değerlendirildi.

Bulgular: Çok düşük konsantrasyonlarda bile gümüş nanoparçacıkların antimikrobiyal aktivitesinin küçülen boyutla arttığı ve yüksek antibakteriyel ve antikandidal uygulamaya sahip olduğu ortaya çıktı.

Anahtar Kelimeler: *Crocus sativus*, CS-AgNP'ler, MİK, Antibakteriyel etki ve Antifungal etki.

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INTRODUCTION

Silver nanoparticles show large surface areas and good conductivity (1). Biosensor is one of the most frequently studied subjects by scientists in recent years due to its chemical stability, drug transport, catalytic properties, electrical conductivity. The creation of multi-purpose nanostructures for application in many industrial industries is an important area for researchers today due to their unique properties. Food safety and food protection, Engineering, biomedicine, waste and environment (environmental remediation) and bio-energy, Drug design, drug active ingredients and alternative structures to antibiotics are considered as the main areas for nanomaterial applications. Additionally, when making NPs, environmentally friendly methods were preferred over chemical and physical methods, particularly when used to reduce environmental waste and stop the growth of pathogenic microbes. (2). Saffron flowers-Silver nanoparticles (AgNPs) are employed in a wide range of industries, including medicine, bioremediation research, catalysis, the food and cosmetics sector, agriculture, electronics, and medication antibiotics. Antibiotics have become indispensable in the world of medicine since the day they were discovered. It can be used in almost every disease. However, humans' unconscious use of antibiotic-resistant microorganisms increases antibiotic resistance. Biological sources such as bacteria, fungi and plants are used in the synthesis of AgNPs by the biological method, which is a very common method in the synthesis process (3). The use of plant sources, the ability of plants to generate more nanoparticles than other species, the stability of the particles produced, and the simpler, more cost-effective, ecologically friendly, and easier ways to apply them are a few of these factors that contribute to the popularity of this sector (4). Due to this, "green synthesis" techniques that are quick, inexpensive, and do not harm the environment are preferred over currently used conventional methods for producing nanoparticles. Plant leaves (6), berries, roots, tubers, seeds, flowers (7), plant leaves (6), The plant's aerial components are most frequently used in the manufacture of AgNPs. The biological process, which is simple, non-toxic, and less expensive, is the ideal way for creating nanoparticles. The green method is the best method of synthesizing nanoparticles, the

biological method, as it is easy, non-toxic and cheaper. It can also be used for the synthesis of large quantities of nanoparticles and dimensional (nm). Another benefit is that biotechnology is easier to use, more environmentally benign, and more repeatable than waste materials. Additionally, the nanoparticles created using this technique are typically more stable (6-8).

Traditional medicine uses the saffron flower plant, which was used in this study, to treat liver conditions, constipation, typhoid fever, among other ailments. Our goal was to create bioactive Ag-NPs (antibacterial and antifungal) using bioactive components from plant sources, such as terpenes, alkaloids, flavonoids, phenols, and terpenoids, which convert Ag+ ions to Ago form in aqueous structure and create CS-AgNPs (8).

The saffron plant has a pungent taste and iodoform or straw-like odor. The reason for this is the chemicals picrocrocin and saffronal found in the composition. It also contains a carotenoid dye called crocin, which adds a golden yellow color to the environment when used for food consumption. This unique property makes saffron (*Crocus sativus*) a highly sought after product around the world. It is also known to be used in the medical field.

The Mediterranean region is where saffron, or *Crocus sativus* (CS), is typically grown. It is an herbaceous plant that is growing in the Black Sea region of Turkey. Since it is a bulbous culture plant, it is now widely grown throughout the world.

In this study, CS-AgNPs were created, described, and their antibacterial activity assessed utilizing an inexpensive, simple, and ecologically friendly extraction approach from the waste saffron flower's purple flower parts.

METHODS

In the study, purple saffron (*Crocus sativus*) flowers (CS) from the Safranbolu area of Karabük Province were employed. Vancomycin, fluconazole, colistin, and AgNO3 (99.8% pure) were purchased from Sigma Aldrich. The anti-microbials properties of CS-AgNPs were tested on grampozitive and gram negative bacterials.

Extraction of purple flowers of saffron (Crocus sativus (CS))

The CS purple flowers were dried after being thoroughly cleaned with distilled water. 100 cc of distilled water and three grams of dried purple blossoms were combined and cooked in a beaker. Following this procedure, it underwent filtration. The resultant filtrate was used to create silver nanoparticles (CS-AgNPs) and kept chilled at +4 °C.

Synthesis of Crocus sativus Supported-Silver nanoparticles (CS-AgNPs)

The solid silver nitrate salt was converted into a thirty mM AgNO3 aqueous solution for the environmentally friendly synthesis of Cs-AgNPs. In a glass container, the previously produced CS Extract and AgNO3 were added in

a 2:3 ratio to the reaction medium at 50 oC. By using wavelength scanning using UV-vis spectroscopy, it was discovered that the reaction was complete depending on the synthesis of CS-AgNPs and color change (9,10). The dark solution was centrifuged for 15 minutes at 8500 rpm after the reaction. After multiple washings, the solid fraction that had been recovered after centrifugation was dried for 24 hours at 90°C in an oven. The produced nanoparticles were then kept sealed at room temperature for the evaluation of their antibacterial activity.

Characterization of Saffron Flower Supported-Silver nanoparticles

By using a spectroscopic approach, the UV-vis spectra of CS-AgNPs produced with biological support were identified in the wavelength range of 250-700 nm. CS-AgNPs were examined using the following techniques: FTIR, SEM, FE-SEM, TEM, XRD, EDX and Zetasizer. The analyses of size, morphology, crystal structure, surface distribution, and zeta potential were highlighted. The Debye-Scherrer equation (11, 12)) was applied to calculate the crystal size of CS-AgNPs.

Evaluation of antimicrobial activities of saffron flower supported-silver nanoparticles (CS-AgNPs)

The MICs of Cs-AgNPs towards gram-negative bacteria (*P. aeruginosa* ATCC27833, *E. coli* ATCC25922), gram-positive bacteria (*S. aureus* ATCC29213, *B. subtilis* ATCC 11774), and a gram- bacteria (*C. albicans*) were calculated using a microtiter plate containing 96 wells. Murphy Hinton The wells were filled with RPMI, which (Growth Medium Used in Cell Growth) for yeast and broth for bacteria. The microplates containing the medium and microorganisms received an addition of AgNPs solution. Each time, 100 L was drawn and transferred to the following well. The microplates were then filled with a certain volume of microbe solutions that had been created and adjusted in accordance with 0.5 McFarland. At 37°C, it had been incubated for one full day. The MIC value was established as the lowest concentration at which growth did not occur following incubation (13-15). Additionally, the antibacterial properties of CS-AgNPs on *C. albicans, S. aureus, P. aeruginosa, B. subtilis* and *E. coli* were evaluated in comparison to those of the commercial antibiotics vancomycin, colistin, and fluconazole as well as 30 mM $AgNO_3$ solution.

RESULTS

Antibiotics used, the antimicrobial capabilities of CS-AgNPs grows into more significant. Foodborne infections tend to be caused by the pathogenic microorganisms *E. coli, B. subtillis, P. aeruginosa, S. aureus, and C. albicans* (16, 17). The results of the investigation demonstrated that bio-derived CS-AgNPs strongly suppressed the spread of these bacteria even at low doses. (Table 1). It was found that

Staphylococcus and Bacillus subtilis were more effectively repressed by CS-AgNPs than other bacteria. Due to their propensity to interact with the phosphorous and sulfur atoms in bacterial cell walls, plant-derived silver nanoparticles compromise with the thiol molecules and phosphate groups in bacterial cell membranes, which prevents bacteria from respirating. Bacteria perish as a result of this (16).

Table 1 MIC values of CS-AgNPs, AgNO3 and antibiotics (mg/mL)

Microorganisms	**CS-AgNPs**	**$AgNO_3$**	**Antibiyotics**
Staphylococcus aureus ATCC 29213	0. 125	3.75	2
Bacillus subtilis ATCC11774	0.0625	1.87	1
Escherichia coli ATCC25922	1.0	0.93	2
Pseudomonas aeruginosa ATCC27853	1.0	7.50	4
Candida albicans	0.5	0.47	2

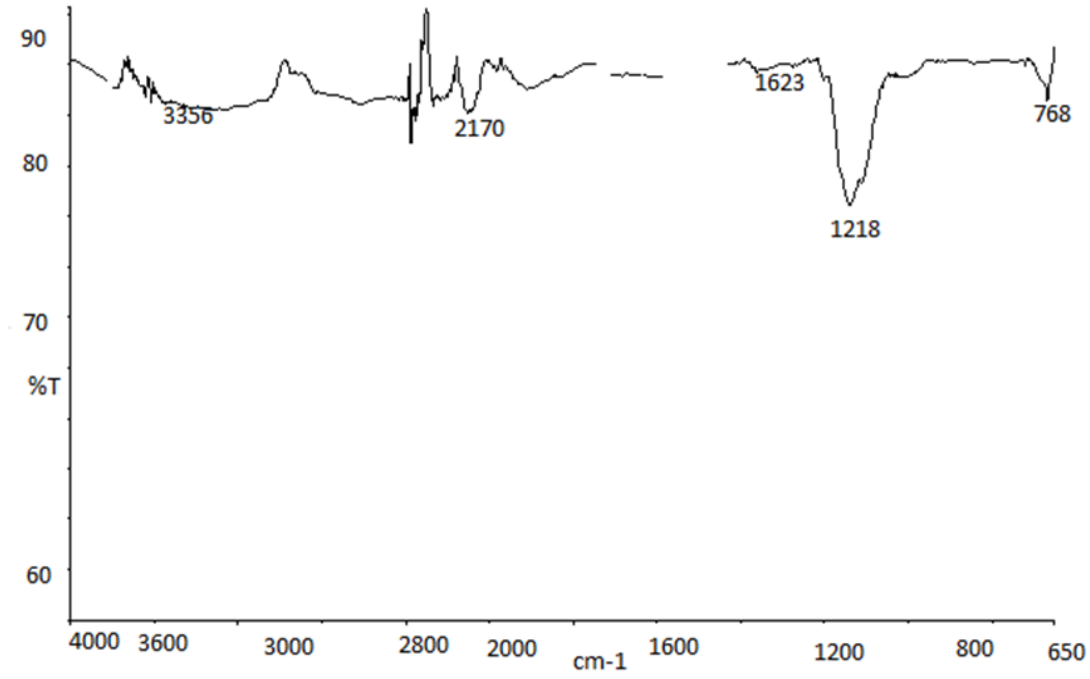

Figure 1. Purple parts of saffron flower FTIR spectrum.

DISCUSSION

The main objective of this study was to first synthesize and characterize reproducible, highly monodisperse CS-AgNPs. Next, we determined the in vitro antibacterial and antifungal activity of CS-AgNPs of saffron flower origin. antimicrobial inhibitory actions of CS-AgNPs, AgNO3 solution, and conventional antibiotics on human infection growth were assessed. The concentrations ranged from 0.0625-0.125 g mL-1. There were several significant MICs for growth inhibition of Gram-negative bacteria. On

the other hand, an experimental test was used to identify the effective growth suppression concentrations, which were 1.0 mL-1 for a Gram-strains and 0.5 mL-1 for C. albicans yeast. At a lower level than the two antibiotics, CS-AgNPs were active. On the other hand, gram-positive bacteria appear to be more sensitive to the AgNO3 solution. It has been verified that CS-AgNPs minimize the growth of several pathogens tested at extremely low concentrations when compared to standard antibiotics and AgNO3 solution. On the other hand, gram-positive microbes have a hard polysaccharide layer that gram-negative bacteria do not, making the transition to the a gram- bacterium wall more difficult. AgNPs have a larger regulatory impact on gram-positive bacteria than gram-negative bacteria as a result (5,18). In other comparable experiments, they discovered that gram positive S. aureus had resistance to AgNPs that was roughly 2-3 times higher than that of gram-negative P. aeruginosa and E. coli. In the studies of silver nanoparticles with a green synthesis origin conducted by many researchers, it is observed that AgNPs have inhibitory effects on both gram-positive and - bacteria as well as yeasts (13,19,20).

CONCLUSION

The studied strains were resistant to the biogenic AgNPs' antibacterial and anticandidal effects. The deformation and distortion in bacteria and candidal cells stimulated with the AgNPs that are biogenic were confirmed by ultrastructural analysis. The ability of biogenic AgNPs to penetrate cells due to their small particle size as well as the capping effect of biomolecules adsorbed on the outer layer may both contribute to their high efficacy. One of the fastest-growing technological fields is bionanotechnology, which consists of biologically inspired nanostructures and metallic nanoparticles made from the substances that make up their fundamental building blocks. This study used CS flower extract to quickly and easily create green CS-AgNPs without the use of any harmful chemicals. UV-vis intake, XRD and EDX, FESEM, TEM examination of the bioassisted produced CS-AgNPs revealed that they were generally cylindrical with a mean length of roughly 67.9 nm. It was discovered that silver nanoparticles showed excellent antibacterial and anticandidal activity even at extremely low concentrations and that their ability to fight bacteria increased with decreasing size. It may be utilised to produce commodities obtained from the life sciences on a tight budget by using easy, basic, and practical methods. Synthesized nanoparticles derived from biological sources are available in a variety of sizes and exhibit a wide range of properties, including anticancer, anti-diabetic, stability, surface functionality, biocompatibility, and antibacterial activity. The science of nanotechnology needs more research and a greater range of species (21, 26-28). But it

is obvious that more investigation is required to reveal the medical uses of metallic nanoparticles.

Ethics Committee Approval: There is no need for an ethics committee.

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ARAŞTIRMA MAKALESİ/ RESEARCH ARTİCLE **DOI:** 10.56941/odutip.1287032

Evaluation of Intestinal Parasites in Patients with Chronic Disease

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Abstract

Objective: Parasitic diseases concern all segments of society, especially children in the growing age. Intestinal parasites not only cause mental and physical development retardation, but also cause loss of work force with the complaints they cause, negatively affecting both physical and mental health and the country's economy. In this study, we aimed to evaluate intestinal parasites in patients with chronic diseases.

Methods: The files of patients who applied to the internal medicine outpatient clinic between 01.01.2022 and 31.12.2022 and underwent direct stool microscopy in the Parasitology Laboratory of Ordu University Medical Faculty were retrospectively scanned. The patients were divided into 2 groups as those with chronic disease and those without chronic disease. As a chronic disease; Diabetes Mellitus, hypertension, chronic heart disease, chronic heart failure, asthma, chronic obstructive pulmonary disease, other chronic lung diseases, chronic kidney failure, chronic liver failure, goiter diseases, rheumatic diseases were taken as. Socio-demographic characteristics of the patients such as age, gender, educational status, economic status and marital status, and stool microscopic examinations were recorded.

Results: 385 patients were evaluated in the study. It consisted of 281 female and 104 male patients. 209 patients with chronic disease were identified. There is a significant relationship between age, marital and educational status and chronic diseases in the comparison of those with and without chronic disease according to their socio-demographic characteristics (P<0.005).

Conclusion: There was no significant difference between those with and without chronic disease in terms of intestinal parasites. However, it has been suggested that controlled studies are needed by increasing the number of patients in the patient groups.

Key Words: Chronic diseases, intestinal parasites, parasites

Kronik Hastalığı Olan Hastalarda Bağırsak Parazitlerinin Değerlendirilmesi

Özet

Amaç: Parazit hastalıkları büyüme çağındaki çocuklar başta olmak üzere toplumun tüm kesimlerini ilgilendirmektedir. Bağırsak parazitleri, zihinsel ve bedensel gelişme geriliğine neden olmasının yanı sıra, oluşturdukları şikayetler ile işgücü kaybına da neden olarak hem beden ve ruh sağlığını hem de ülke ekonomisini olumsuz etkilemektedir. Bu çalışmada kronik hastalığı olan hastalarda barsak parazitlerini değerlendirmeyi amaçladık.

Metod: 01,01,2022- 31,12,2022 tarihleri arasında iç hastalıklarına polikliniğine başvuran, Ordu Üniversitesi Tıp Fakültesi Parazitoloji Laboratuvarında gaita mikroskopisi yapılan hastaların dosyaları retrospektif olarak tarandı. Kronik hastalığı olan ve kronik hastalığı olmayan olmak üzere hastalar 2 gruba ayrıldı. Kronik hastalık olarak; Diabetes Mellitus, hipertansiyon, kronik kalp hastalığı, kronik kalp yetmezliği, astım, kronik obstrüktif akciğer hastalığı, diğer kronik akciğer hastalıkları, kronik böbrek yetmezliği, kronik karaciğer yetmezliği, guatr hastalıkları, romatizmal hastalıklar olarak alındı. Hastaların yaş, cinsiyet, eğitim durumu, ekonomik durumu ve evlilik durumu gibi sosyo-demografik özellikleri, gaita mikroskobik incelemeleri kaydedildi.

Bulgular: Çalışmada 385 hasta değerlendirmeye alınmıştır. Bunların 281'i kadın 104'ü erkek hastadan oluşmuştur. Kronik hastalığı olan 209 hasta tespit edilmiştir. Kronik hastalığı olan ve olmayanların sosyo demografik özelliklerine göre karşılaştırmasında yaş, evlilik ve eğitim durumu ile kronik hastalıklar arasında anlamlı bir ilişki vardır (P<0,005).

Sonuç: Barsak parazitleri açısından kronik hastalığı olan ve kronik hastalığı olmayanlar arasında anlamlı bir fark bulunmamıştır. Ancak hasta gruplarındaki hasta sayısının artırılarak kontrollü çalışmalar gerektiği önerisi sunulmuştur.

Anahtar Kelimeler: Kronik hastalıklar, bağırsak parazitleri, parazitler.

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INTRODUCTION

Low socio-economic level, inadequate or unbalanced nutrition, crowded environments, low body resistance predispose to parasitic infections (1). Intestinal parasites can cause various gastrointestinal system symptoms such as nausea, vomiting, abdominal pain, diarrhea, constipation, increased appetite and loss of appetite in infected individuals. It causes neurological disorders, restlessness, grinding of teeth and psychic disorders (2). Many studies have been carried out in our country and other countries for the immunology, pathology, epidemiology, diagnosis-treatment-protection of parasitoses, and it has been observed that parasites are common in all regions and in all age groups (3). In some cases caused by parasites, some of the patients are chronic and may lead to death in a long time. They cause loss of blood, vitamins, malnutrition, anemia, getting infections more quickly, and other secondary diseases due to a decrease in body immunity (4).

In the study, the detection of intestinal parasites in patients with chronic diseases was investigated. At the same time, it was aimed to compare the incidence of parasites and the socio-demographic characteristics of the patients such as age, gender, educational status, economic status and marital status.

METHODS

Before starting the study, approval was obtained from the Ordu University Clinical Research Ethics Committee (2023/100). The files of patients who applied to the internal medicine outpatient clinic between 01.01.2022 and 31.12.2022 and underwent direct stool microscopy in the Parasitology Laboratory of Ordu University Faculty of Medicine were retrospectively scanned. Patients with chronic disease and without chronic disease were divided into 2 groups. Stool microscopic examinations were recorded.

Statistics: Thechi-square test was used to compare the groups. Inchi-square tests, if the expected frequency of a cell is below 5, Likelihoodrati oki-square value was calculated instead of Pearson chi-square value. Categorical data were expressed as number sand percentages. All calculations were made with SPSS v26 (IBM Inc., Chicago, IL, USA) statistical pack age program.

RESULTS

In the study, 385 patients were evaluated. It consisted of 281 female and 104 male patients. 209 patients with chronic disease were identified. The comparison of those with and without chronic disease according to their socio-demographic characteristics is given in Table 1. According to the table, there is a significant relationship between age, marital and educational status and chronic diseases (P<0.005). Percentage of chronic disease incidence was found to be higher than 50 years of age and above. Again, the percentage of chronic diseases was found to be higher in married people. Also, when looked at according to education level, the percentage of chronic diseases was found to be higher in those who graduated from primary school.

In the study, the parasite was found in 130 patients with chronic disease (Table 2). No significant correlation was found between the incidence of the parasite and chronic diseases. However, the most common parasites include *Blastocystis* spp. and *Cryptosporidium* spp. is

Table 1. Comparison of socio demographic characteristics

	Without Chronic Disease	With Chronic Disease	P value
Age n (%)			
15-19	4 (2.3)	8 (3.8)	
20-24	15 (8.5)	4 (1.9)	
25-29	17 (9.7)	0	
30-34	20 (11.4)	6 (2.9)	***0,0001***
35-39	11 (6.3)	13 (6.2)	
40-49	49 (27.8)	38 (18.2)	
50 andabove	60 (34.1)	140 (67)	
Gendern(%)			
Female	134 (76.1)	147 (70.3)	0.208
Male	42 (23.9)	62 (29.7)	
MaritalStatus n (%)			
Single	15 (8.5)	12 (5.7)	
Married	145 (82.4)	153 (73.2)	***0.004***
Widow	16 (9.1)	44 (21.1)	
Economical Situationn(%)			
High	13 (7.4)	16 (7.7)	
Middle	133 (75.6)	161 (77)	0.898
Low	3 (17)	32 (15.3)	
Education Statusn(%)			
Illiterate	45(25)	72(34.4)	
PrimaryEducation	81(46)	102(48.8)	***0.021***
SecondaryEducation	33 (18.8)	19(9.1)	
University	17(9.7)	16(7.7)	

In the study, the parasite was found in 130 patients with chronic disease (Table 2). No significant correlation was found between the incidence of the parasite and chronic diseases. However, the most common parasites include *Blastocystis* spp. and *Cryptosporidium* spp. is

Table2. Comparison of Intestinal Parasites

	WithoutChronicDisease N (%)		WithChronicDisease N (%)		P value
	NegativePositive		NegativePositive		
Intestinal Parasite	63(35.8)	113(64.2)	79(37.8)	130(62.2)	0.751
Blastocystis hominis	111(63.1)	65(36.9)	145(69.4)	64(30.6)	0.196
Iadamoeba butschlli	171(97.2)	5(2.8)	205(98.1)	4(1.9)	0.738
Entamoeba coli	148(84.1)	28(15.9)	177(84.7)	32(15.3)	0.889
Entamoeba histoloytica	175(99.4)	1(0.6)	208(99.5)	1(0.5)	1
Dientamoeb afragilis	172(97.7)	4(2.3)	197(94.3)	12 (5.7)	0.124
Giardia intestinalis	164(93.2)	12(6.8)	199(94.7)	11(5.3)	0.527
Chilomastix mesnili	176 (100)	0	207(99.5)	1(0.5)	1
Enterobius vermicularis	174(98.9)	2(1.1)	200(96.2)	8(3.8)	0.117
Hymenolepis nana	176 (100)	0	207(99.5)	1(0.5)	1
Cryptosporidium spp.	118(67)	58(33)	142(68.3)	66(31.7)	0.827
Cyclospora cayetenensis	173(98.3)	3(1.7)	202(97.1)	6(2.9)	0.516
Entamoeba hartmanni	173(98.3)	3(1.7)	208(100)	0	0.095
Ascaris lumbricoides	175(99.6)	1(0.6)	207(99.5)	1(0.5)	1
Taenia spp.egg	175(99.6)	1(0.6)	207(99.5)	1(0.5)	1

DISCUSSION

In the study, the patients who applied to the internal medicine outpatient clinic and underwent parasite examination were evaluated retrospectively and the patients were divided into 2 groups as those with chronic disease and without chronic disease. As a chronic disease; Those who had parasite examination for diabetes mellitus, hypertension, chronic heart disease, chronic heart failure, asthma, chronic obstructive pulmonary disease, other chronic lung diseases, chronic kidney failure, chronic liver failure, goiter diseases, rheumatic diseases were screened. Those who did not have parasite examination and did not have chronic diseases were also screened as a control group.

Kulik et al. investigated intestinal parasites in stool samples taken from 86 dialysis patients and 146 healthy volunteers and found *Blastocystis spp* in 18 people, *Endolimax nana* in 14 people, and *Cryptosporidium* spp and *Entamoeba coli* in 4 people. The frequency of parasites in patients undergoing dialysis was found to be 45.1%, and it was recommended that *Blastocystis* spp and *Cryptosporodium* spp should not be ignored in routine controls (5). Kumar et al. analyzed stool samples from 160 HIV-positive patients and looked for intestinal parasites. Stool samples were taken from 59 patients with chronic diarrhea, 50 patients without diarrhea, HIV positive patients and 41 patients with acute diarrhea. Parasites were detected in 39% of those diagnosed with diarrhea and 14% in those who did not. *Cryptosporidium* spp was found in 7 patients with chronic diarrhea, 28 patients with diarrhea and dialysis were included in the study, and parasites were seen in 78.6% of these patients. *G. intestinalis* 17.9%, *Cryptosporidium* spp 10.7%, *E. histolytica* 7.1%, *Microsporodia spp* 10.7%, *E. coli* 7.1% (6). Türkçapar et al. investigated the frequency of *Cryptosporidium* in 74 dialysis patients and 50 healthy volunteers

using the MAF method. 15 (20.3%) *Cryptosporidium* spp. oocysts were detected in 74 patients (7). Ferrerira et al. analyzed 330 samples from 110 chronic hemodialysis patients and found *E. histolytica/E. dispar* in 9 patients, *G. intestinalis* in 1 patient, *Strongyloides stercoralis* in 2 patients, *E. nana* in 6 patients, and *E. coli* in 11 patients (8). In a study conducted in patients receiving hemodialysis treatment, *Cryptosporidium spp.* they found (9). In another study conducted in diabetic patients, *Cryptosporidium spp* was found in 12.9% (10). Abaza et al. examined 427 stool samples from patients with malignancy, diabetes, corticosteroid therapy, and renal failure and detected parasites in 23% of them. It was seen in 28.8% of patients with kidney failure and 8% of diabetics. Of the parasites, *G. intestinalis* (10.3%), *E. histolytica* (7%), *Cryptosporidium* spp (6.3%), *Microsporodia* (2.3%), *S. stercoralis* (0.7%) (11). Baqai et al. examined parasites in stool samples from 10 cancer, 20 dialysis, 20 diabetic patients. In 50 stool samples, 40% of *Cryptosporidium* spp found positive. *Cryptosporidium* spp. was detected in 25% of diabetic patients, 35% of dialysis patients, and 80% of cancer patients (12).

In this study, parasites were found in 130 patients with chronic disease. Common parasites include *Blastocystis* spp. and *Cryptosporidium* spp. and no significant difference was observed between chronic diseases. Again in the study, a significant difference was found between age, marital and educational status and chronic diseases. No difference was found between socio-demographic characteristics and the presence of parasites. This may be due to the small number of patients with chronic diseases.

CONCLUSION

In the study, when the patients with and without chronic diseases were compared, no significant difference was found between the incidence of parasites. However, it was suggested that controlled studies should be carried out by expanding the patient groups. Again, frequently encountered parasites *Blastocystis* spp. and *Cryptosporidium* spp. is.

Cryptosporidium spp.. is a pathogenic parasite and should be followed. In this direction, parasite examination will be performed routinely in chronic diseases, and the quality of life will be increased by treating the parasites detected.

Ethics Committee Approval: This prospective study was approved by the ethical review committee of Ordu University (ODU) (2023/100).

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OLGU SUNUMU/ CASE REPORT **DOI:** 10.56941/odutip.1260166

Localized Petechiae in the Anterior Chest Wall in a Patient with Thrombocytopenia

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Abstract

Thrombocytopenia is a very common hematological disorder that can be seen in many diseases such as splenomegaly diseases, infectious diseases, microangiopathic hemolytic anemias (TTP, HUS) that may occur due to drugs and malignant diseases infiltrating the bone marrow. Thrombocytopenia causes bleeding diathesis and causes petechial and purpuric rashes on the skin and mucous membranes. The petechial eruptions seen in thrombocytopenia are generally widespread throughout the body and are not limited to a single area. In this case report, we wanted to present a 78-year-old patient with thrombocytopenia, who had a diffuse and intense petechial rash on the anterior chest wall secondary to thrombocytopenia but did not have petechiae in other parts of the body.
Key Words: Localized petechial rash, thrombocytopenia, multiple myeloma

Trombositopenili Bir Hastada Göğüs Ön Duvarında Lokalize Peteşiler

Özet

Trombositopeni, ilaçlara, maling hastalıkların kemik iliğini infiltre etmesine bağlı oluşabilen, splenomegali yapan hastalıklar, enfeksiyöz hastalıklar, mikroanjiopatik hemolitik anemiler (TTP, HÜS) gibi birçok hastalıklarda görülebilen, klinikte çok sık rastlanılan hematolojık bir bozukluktur. Trombositopeni kanama diatezine neden olup cilt ve mukozalarda peteşial ve purpurik döküntülere neden olmaktadır. Trombositopenide görülen peteşial döküntüler genellikle tüm vücutta yaygındır, tek bir bölgeye sınırlı değildir. Bu olgu sunumunda 78 yaşında trombositopenisi olan ve trombositopeniye sekonder göğüs ön duvarında yaygın ve yoğun peteşial döküntü olmasına rağmen vücudun diğer kısımlarında peteşisi olmayan hastayı sunmak istedik.
Anahtar Kelimeler: Lokalize peteşial döküntü, trombositopeni, multiple myelom

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INTRODUCTION

Thrombocytopenia is defined as platelet count less than 150 × 103 per μL (1). It may result from decreased platelet production, increased destruction, splenic sequestration, dilution, or intravascular aggregation (2). Increased platelet destruction is the most common cause of thrombocytopenia. It occurs when the rate of platelet destruction exceeds the rate of production. Platelet destruction is due to intracorporeal defects or extracorpuscular disorders. Decreased platelet production occurs in conditions that cause suppression of main cells or megakaryocytes in the bone marrow, such as myelosuppressive drugs, radiation, and aplastic anemia. Megakaryocytic hypoplasia or aplasia, ineffective thrombopoiesis, and defects in the mechanisms controlling thrombopoiesis cause decreased platelet production. Pure megakaryocytic aplasia or thrombocytopenia due to hypoplasia is a rare condition. Amegakaryocytic thrombocytopenia is usually associated with disturbances in other cell lines such as macrocytosis or dyserythropoiesis. Abnormal platelet distribution is seen as a result of platelets being retained in the enlarged spleen (3).

Patients with platelet counts greater than 50 × 103 per μL are usually asymptomatic. Patients with platelet counts of 30 to 50 × 103 per μL present as petechiae, purpura, ecchymosis. Bleeding can occur even with minimal trauma in platelet counts from 10 to 30 × 103/μL. Platelet count below 10 × 103 per μL may cause spontaneous bleeding and constitute a hematological emergency (1,2). Although thrombocytopenia is classically associated with bleeding, there are conditions in which bleeding and thrombosis may occur, such as antiphospholipid syndrome, heparin-induced thrombocytopenia, and thrombotic microangiopathies. Patients with isolated thrombocytopenia without systemic disease most likely have immune thrombocytopenia or drug-induced thrombocytopenia. In stable patients considered outpatient, the first step is to rule out pseudothrombocytopenia by collecting blood in a tube containing heparin or sodium citrate and repeating the platelet count. If thrombocytopenia is confirmed, the next step is to differentiate acute thrombocytopenia from chronic thrombocytopenia by obtaining or reviewing previous platelet counts. Hospitalization may be required in patients with acute thrombocytopenia. (2).

CASE

A 78-year-old male patient was being followed up in the cardiology service because of right heart failure and peripheral edema. Upon detection of petechial rash in the physical examination of the patient, internal medicine consultation was requested. He was transferred to the internal medicine service to investigate the etiology of anemia and thrombocytopenia. In the

patient's anamnesis, there were red-colored rashes that occurred only on the chest and anterior face for the last 6 months, which were not found in other parts of the body. He had a history of chronic obstructive pulmonary disease, congestive heart failure, and atrial fibrillation. In her family history, the mother had hypertension. On physical examination, arterial blood pressure: 120/70 mmHg, Heart rate: 85/minute, Respiratory rate: 18/minute, Fever: 36.7 C. On general inspection, the patient was pale and orthopneic. Conjunctivae were pale on head and neck examination. In the respiratory system examination, petechial eruptions were found on the anterior chest wall, covering the entire anterior chest. There was no petechial purpuric rash elsewhere on the body. (Figure 1) On auscultation, there were rales and rhonchi in the lower zones of the lung.

No pathology was detected in the abdominal examination. Extremity examination revealed pretibial edema (Figure, 2). In the whole-body inspection examination, no petechial rash was found in any part of the body except the anterior chest wall. In the results of the blood analysis, Hg: 9.4 g/dl, MCV: 104 fL, platelet: 47 103/ µL, BK: 8.22 103/µL, BUN: 59 g/dl, CRE: 1.97 mg/dl, AST: 28 U/L, ALT: 13 U/L, INR: 1.38 sedimentation: 95 /hour. Folate and vitamin B12 levels were normal. Peripheral smear was performed from the patient with thrombocytopenia. Normochromic macrocytic erythrocytes were seen. No schistositis was observed. The platelet count was calculated as 40,000. The white blood cell count was consistent with the blood count and no atypical cells were seen. Dermatology consultation was requested for petechial eruptions on the anterior chest wall. Dermatology stated that the image is secondary to thrombocytopenia and that the petechial image can be seen in isolation in some skin structures. Biopsy was not considered necessary by the dermatologist for the patient with thrombocytopenia and petechia purpuric rash. Thoracic computed tomography (CT) and abdominal CT were performed in the patient whose malignancy was investigated. No malignant focus was found in the thorax and abdominal CT results. In the magnetic resonance imaging (MRI) requested from the patient, in the MRI of the pelvis; A suspicious image was detected in terms of metastases with heterogeneous medullary signals in the femoral head and neck. The patient was consulted to hematology. Serum protein electrophoresis and immunofixation were sent from the patient with suspected multiple myeloma, and bone marrow biopsy was performed. PET-CT was planned for the patient. As a result of serum protein electrophoresis, beta-2 globulin was detected as 32% (3.2-6.5). Monoclonal M protein was seen in serum protein electrophoresis.

In PET-CT, "Hypermetabolic mass lesion (malignancy?) in the right scapula that is

destroying the coracoid process. A 10 mm hypermetabolic lymph node (inflammatory pathologies? metastasis?) in the left axilla. 17x12 and 11x11 mm hypermetabolic nodular lesions (inflammatory pathologies?) in the left lung upper lobe apicoposterior segment. The possibility of malignancy cannot be completely excluded. Minimal hypermetabolic irregular density increase areas (inflammatory/sequelae changes?) were observed in both lungs, the most prominent being in the lower lobe superior segments, which had a nodular appearance in places".

Figure 1. Anterior Chest Wall of Patient with Localized Petechial Rash

A diagnosis of multiple myeloma was made in the patient whose bone marrow biopsy revealed plasma cell infiltration.

Figure 2. Legs of A Patient with A Localized Petechial Rash (An Area of Body Parts Without a Rash)

DISCUSSION

Petechiae, purpura and ecchymosis; are skin lesions that occur as a result of extravasation of erythrocytes and erythrocyte products. These lesions are called petechiae when they are smaller than 2 mm, purpura when they are 2-10 mm in size, and ecchymosis when they are larger than 1 cm (4). Petechiae occurring after

thrombocytopenia are generally common and are not localized.

There are case reports of localized petechial eruptions in the literature. st. Clair et al. reported a petechial rash due to acutely ruptured dermal capillaries in the distal extremity following the application of a tourniquet-like force to one extremity. It is mentioned that this condition, called the Rumpel-Leede (R-L) phenomenon, is a rare condition in which dermal capillaries rupture acutely after a tourniquet-like force is applied to an extremity (5). In another publication, it was mentioned that R-L phenomenon may develop after tourniquet application due to an underlying vascular disease. It is mentioned that some diseases may be a risk factor for the R-L phenomenon and may predispose to dermal capillary fragility. The Rumpel-Leede phenomenon has been noted in patients with diabetes mellitus, acute or chronic hypertension, and thrombocytopenia (6).

Again, Lee et al. reported that healthy infants with localized purpura and/or petechiae without fever are more likely to have a benign etiology. They mentioned that the possible cause of localized petechiae may be due to a tourniquet case (diaper as an example) (7). Boureau et al. reported that Staphylococcus aureus infection caused localized vascular purpura in the right leg 7 years after vascular prosthesis was inserted. They mention that this case is a rare complication that occurs as an acute infection 7 years after the primary surgery (8).

Bhalla et al.'s skin biopsy of a purpuric lesion localized on the arm in a patient with pityriasis rosea; They found that there was an acanthotic epidermis with mild hyperkeratosis, mild spongiosis and parakeratosis (9).

In another publication by Amlie-Lefond et al., they described a 13-year-old female patient with right frontal high-grade glioma and complex partial seizures who developed localized purpura after 23 months of monotherapy with an antiepileptic agent, lamotrigine. This case study is the second report of localized purpura after long-term lamotrigine therapy, suggesting that this may be an atypical lamotrigine-induced drug reaction. (10)

CONCLUSION

Localized thrombocytopenia cases in different conditions have been mentioned in the literature and different mechanisms for their formation have been explained. In our case, unlike these, a patient with thrombocytopenia developed as a result of multiple myeloma bone marrow infiltration had atypical petechiae rash that developed only on the anterior chest wall.

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Localized Petechiae in the Anterior Chest Wall in a Patient with Thrombocytopenia

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Abstract

Thrombocytopenia is a very common hematological disorder that can be seen in many diseases such as splenomegaly diseases, infectious diseases, microangiopathic hemolytic anemias (TTP, HUS) that may occur due to drugs and malignant diseases infiltrating the bone marrow. Thrombocytopenia causes bleeding diathesis and causes petechial and purpuric rashes on the skin and mucous membranes. The petechial eruptions seen in thrombocytopenia are generally widespread throughout the body and are not limited to a single area. In this case report, we wanted to present a 78-year-old patient with thrombocytopenia, who had a diffuse and intense petechial rash on the anterior chest wall secondary to thrombocytopenia but did not have petechiae in other parts of the body.
Key Words: Localized petechial rash, thrombocytopenia, multiple myeloma

Trombositopenili Bir Hastada Göğüs Ön Duvarında Lokalize Peteşiler

Özet

Trombositopeni, ilaçlara, maling hastalıkların kemik iliğini infiltre etmesine bağlı oluşabilen, splenomegali yapan hastalıklar, enfeksiyöz hastalıklar, mikroanjiopatik hemolitik anemiler (TTP, HÜS) gibi birçok hastalıklarda görülebilen, klinikte çok sık rastlanılan hematolojık bir bozukluktur. Trombositopeni kanama diatezine neden olup cilt ve mukozalarda peteşial ve purpurik döküntülere neden olmaktadır. Trombositopenide görülen peteşial döküntüler genellikle tüm vücutta yaygındır, tek bir bölgeye sınırlı değildir. Bu olgu sunumunda 78 yaşında trombositopenisi olan ve trombositopeniye sekonder göğüs ön duvarında yaygın ve yoğun peteşial döküntü olmasına rağmen vücudun diğer kısımlarında peteşisi olmayan hastayı sunmak istedik.
Anahtar Kelimeler: Lokalize peteşial döküntü, trombositopeni, multiple myelom

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INTRODUCTION

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Iodine Deficiency

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Abstract

Iodine deficiency is an important public health problem both in our country and around the world. Iodine deficiency and the health problems it causes, to the large-scale struggle involving health and aid organizations such as the World Health Organization, United Nations Children's Fund (UNICEF), to accept 21 October as the Global Day for the Prevention of Iodine Deficiency Disorders to raise awareness, to carry out activities in this regard. however, it is still common. Iodine deficiency is seen in 40% of the world population, especially in rural areas. It affects people of all age groups, including infants, pregnant women and children. Fighting iodine deficiency has become the policy of states. In this regard, it has been decided to iodize table salt worldwide and in our country, and table salt has been iodized. In our country, the necessary legal regulations for the mandatory iodization of all table salt were completed in July 1999 and the use of iodized salt has been expanded since the 2000s. At the end of these struggles, iodine deficiency is slightly reduced compared to the old data, but its frequency is still high. In this review, iodine, the causes of iodine deficiency, its incidence, how it is evaluated, the health problems it causes, its treatment and struggle are mentioned.

Key Words: Iodine Deficiency, Iodine, Public Health problem

İyot Eksikliği

Özet

İyot eksikliği hem ülkemizde hem de dünya çapında önemli bir halk sağlığı sorunudur. İyot eksikliği ve sebeb olduğu sağlık sorunları Dünya Sağlık Örgütü, Birleşmiş Milletler Çocuklara Yardım Fonu (UNICEF) vb sağlık ve yardım kuruluşlarının dahil olduğu geniş çaplı mücadeleye, farkındalık yaratmak için 21 Ekim, Küresel İyot Eksikliği Bozukluklarını Önleme Günü olarak kabul edilmesine, bu konuda faaliyetlerin yürütülmesine rağmen hala sık görülmektedir. Özellikle kırsal bölgeler olmak üzere dünya nüfusunun % 40'ında iyot eksikliği görülmektedir. İnfantlar, gebeler ve çocuklarda dahil olmak üzere tüm yaş gruplarındaki insanları etkilemektedir. İyot eksikliği ile mücadele devletlerin politikası haline gelmiştir. Bu konuda dünya çapında ve ülkemizde sofra tuzlarının iyotlanması kararı alınmış ve sofra tuzları iyotlanmıştır. Ülkemizde tüm sofra tuzlarının zorunlu olarak iyotlanması için gerekli yasal düzenlemeler Temmuz 1999'da tamamlanmış ve 2000'li yıllardan itibaren iyotlu tuz kullanımı yaygınlaştırılmıştır. Bu mücadeleler sonunda eski verilerle karşılaştırıldığında iyot eksikliği biraz azalmakla birlikte hala sıklığı fazladır. Bu derlemede iyot, iyot eksikliği nedenleri, görülme sıklığı, nasıl değerlendirildiği, sebeb olduğu sağlık sorunları, tedavisi ve mücadele konusundan bahsedilmiştir.

Anahtar Kelimeler: İyot Eksikliği, İyot, Halk Sağlığı sorunu

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INTRODUCTION

Iodine deficiency is a global public health problem. Iodine deficiency is a health problem that requires diagnosis and corrective measures at the community level rather than the individual. In different countries, to raise awareness about iodine nutrition, information databases and a website containing information were created (1). In recent years, iodine deficiency has decreased significantly with the iodization of salts. Iodine deficiency is mild to moderate (2).

What is iodine? What does iodine do in the body?

Iodine is a chemical element with an atomic mass of 53. It is found in nature as iodide. A significant amount of this element is found in the oceans. Its concentration in the oceans is approximately 50 μg/L. Iodide from seawater is oxidized to iodine. Iodine evaporates into the atmosphere. It then reaches the surface of soils and plants with rain or as an aerosol or gas. (3).

Iodine is necessary for the synthesis of thyroid hormones. In addition, it acts as an antioxidant, anti-proliferative and pro-apoptotic factor (2). Since the body cannot produce iodine on its own, it must be taken from outside. If iodine is insufficiently taken, thyroid hormone is insufficiently produced. All clinical symptoms and diseases that develop due to iodine deficiency are due to hypothyroidism that develops as a result of iodine deficiency. Insufficient iodine intake and excess iodine intake can cause thyroid diseases (1). Iodine can only be taken with iodine-containing or iodine-added foods. A healthy adult body contains about 15-20 mg, of which 70-80% is stored in the thyroid gland (4).

It is effective in the growth and development period. It is necessary in the synthesis of thyroid hormone. It strengthens our immune system. It prevents the development of cancer. In iodine deficiency, the risk of developing breast, thyroid and prostate cancer increases. It also plays a role in weight control. Weight gain is seen in people with iodine deficiency (1)

What is iodine in?

The amount of iodine taken is directly proportional to the amount of iodine in the environment and in the diet (5). Seawater, seaweed and saltpeter beds are naturally occurring sources of iodine. It is estimated that more than one third of the world's population living in mountainous regions is iodine deficient. Seafood, eggs, and dairy products are important iodine-containing nutrients (6). Cod, salmon, wheat bran, broccoli, pea seeds, and nuts are also iodine-rich foods (7). It is seaweed that contains the most iodine (6). The main source of iodine in

iodine-deficient areas is iodized salts. The fortification of food products with iodine has contributed to a reduction in the once common incidence of goiter and hypothyroidism (8)

What is the daily iodine requirement?

Iodide is required for thyroid hormone synthesis. The thyroid gland needs about 52 mcg of iodide per day in order to synthesize sufficient T4. Severe iodine deficiency develops when iodine intake is consistently <20 mcg/day. (1).

The World Health Organization (WHO) recommends the following daily iodine intake (9):

*90 mcg/day of iodine for infants and children up to 5 years old

*120 mcg/day for children ages 6 to 12

*150 mcg/day for children ≥12 years old and adults

*250 mcg/day during pregnancy and lactation

Maternal T4 production increases in order to maintain the euthyroid state during pregnancy. Therefore, pregnant women have a high need for iodine. Severe maternal iodine deficiency during pregnancy leads to a decrease in maternal T4 production. When maternal T4 is insufficient, T4 crossing the placenta decreases and fetal hypothyroidism develops as a result. Neurological development of the baby is impaired in fetal hypothyroidism (9). With an average of 2 g of iodized salt, the person's daily iodine needs are met. (1)

Evaluation of the amount of iodine in the body

Iodine deficiency is defined as mean urinary iodine concentration <100-299 mcg/L for children and non-pregnant adults and <150-249 mcg/L for pregnant women.

The degree of iodine deficiency is determined by mean urinary iodine concentrations.

* Mild iodine deficiency below 50 to 99 mcg/L

*Moderate iodine deficiency between 20 and 49 mcg/L

* Severe iodine deficiency below <20 mcg/L (9,10) (table 1)

An average daily intake of 150 mcg of iodine corresponds to an average urinary iodine concentration of 100 mcg/L. (9)

How is the metabolism of iodine?

More than 90% of iodine is absorbed from the stomach and duodenum as potassium iodide (11,12). Circulating iodine is retained by the thyroid gland and excess iodine is excreted in the urine (12). Renal iodine excretion is fairly constant. Iodine intake of the thyroid gland varies according to oral iodine intake and plasma amount (13). When iodine intake is sufficient, more than 10% of the absorbed iodine is not taken up by the thyroid gland (5). When iodine intake is low, iodine uptake by the thyroid gland increases. This fraction may exceed 80% in chronic iodine deficiency (14). More than 90% of the iodine taken is excreted in the urine, and a

very small amount of iodine is seen in the stool (5). Significant amounts of iodine are stored in the thyroid as intermediates of the thyroxine synthesis pathway (12).

Tablo 1 Assessment of iodine nutrition based on urinary iodine concentrations (UIC) and grades of iodine deficiency according to world Health Organization (WHO) (9)

Age Group	UIC (µg/L)						
	Excessive	More than Adequate	Adequate	Inadequate	Mild Insufficiency	Moderate Insufficiency	Severe Insufficiency
adults and school-age children	≥300		100–299	<100	50–99	20–50	<20
pregnant women	≥500	250–499	150–249	<150			
lactating women			≥100	<100			

What happens in an excess of iodine?

Sources of excess iodine include medications, radiographic contrast agents, and dietary supplements (algae, seaweed). In patients with endemic goiter and iodine deficiency, iodine administration may suddenly increase thyroid hormone production and cause hyperthyroidism. Administration of iodine in patients with Hashimoto's thyroiditis may trigger or exacerbate hypothyroidism (15).

How Does Iodine Deficiency Occur? What is the Frequency?

The main source of iodine is soil. In our country, since the soils, especially in the eastern Black Sea region, are poor in iodine, its deficiency is more common than in other regions. Iodine deficiency affects 40% of the world's population. Additional factors that include iron, selenium and vitamin A deficiencies, and eating foods containing goitrogenic substances may exacerbate the effects of iodine deficiency (4).

In a study conducted in school-age children aged 9-11 in 20 city centers in our country, the rate of goiter was found to be 31.8%. It is reported that the prevalence of goiter should be above 5% in order to declare goiter endemic in a region. After this study, the target of iodization of salts on a national scale was started. In our country, the necessary legal regulations for the mandatory iodization of all table salts were completed in July 1999 and the use of iodized salt has been expanded since the 2000s (4).

In order to determine the iodine status 3-5 years after the prophylaxis with compulsory iodization in salts, to objectively evaluate the amount of iodine reaching school-age children, and to reevaluate its functionality in the iodized salt production, market, and household chain, a total of Urine samples was taken from 4,128

school-age children and the concentration of iodine in the urine was checked. As a result of the study, in two of the 20 regions (Trabzon, Kastamonu) urinary iodine concentrations exceeded the adequate level of 100 µg/L; In seven of them (Ankara, Samsun, Konya, Isparta, Bayburt, Bursa, Edirne), although a significant improvement was detected compared to the values in 1997-1999, sufficient levels could not be reached and mild to moderate iodine deficiency still continued; there was no significant change in seven regions (Aydın, Burdur, Erzurum, Kayseri, Kütahya, Bolu, Erzincan); Unfortunately, significant decreases were found in four regions (Çorum, Van, Diyarbakır, Malatya) compared to 1997-1999 values (4).

Erdogan et al. (16) In a study they conducted in Turkey in 2007, they found severe iodine deficiency in 7.2%, moderate in 20%, and mild iodine deficiency in 19.3% of 900 school-age children living in urban, rural and suburban areas. In the same study, the amount of iodine in 900 salt samples was examined and it was determined that there was enough iodine (iodine content >15 ppm) in 508 samples (56.5%). Erdoğan et al. (16) reported that 27.8% had moderate and severe iodine deficiency in Turkey. They emphasized that this rate was better than the results of the studies conducted in 1997 and 2002 (58% and 38.9%, respectively). As a result of the study, they stated that iodine deficiency has been solved to a large extent in urban areas, and it continues to be an important problem in rural areas.

What happens in iodine deficiency?

It is especially important during pregnancy and infancy. If there is iodine deficiency in the mother, it can cause miscarriage, stillbirth, insufficient development of the fetus, increased infant mortality rate, neurological disorders and mental retardation in the baby. It can also lead to the development of goiter and hypothyroidism in the baby after birth. The most important cause of preventable mental retardation in the world is iodine deficiency. In adults with iodine deficiency, the synthesis of thyroid hormones is reduced. In order for thyroid hormones to be synthesized, the thyroid gland enlarges and the goiter disease, known among the people, develops. However, according to studies conducted in iodine deficiency, thyroid cancer, infertility, heart failure, heart diseases, neurological and psychiatric problems can be seen in iodine deficiency (17).

When hypothyroidism develops in patients with iodine deficiency, goiter formation, skin dryness, fatigue, constipation, high cholesterol, weight gain, chills, chills, depression, hair loss, severe pain during menstruation can be seen (1). In addition to causing thyroid diseases, metabolic disorders and growth retardation, it can facilitate the development of cancer. Correction of iodine deficiency reduces the risk of malignancy (2).

Diffuse and nodular goiter:

Goiter was first understood to be associated with iodine deficiency in 1920. In one study, goiter was treated and prevented by giving iodine to children in an area endemic for goiter. After this study, the use of iodized salt was started in endemic areas and growth retardation due to hypothyroidism was prevented. Goiter is the most obvious result of iodine deficiency. Reduction in iodine intake leads to decreased production of T4 and T3. It increases the secretion of thyroid stimulating hormone (TSH) to normalize the production of T4 and T3 in the body. TSH also stimulates the growth of the thyroid gland, causing goiter. Goiter develops as a compensatory response to iodine deficiency.

The goiter is diffuse at first and later becomes nodular. Some cells in the thyroid follicles multiply more than others and a nodule are formed. Nodules may enlarge over time and may undergo cystic degeneration, bleeding, and calcification. Thus, in iodine-deficient areas, children and adolescents often have diffuse goiter, while adults living in iodine-deficient areas for a long time have nodular goiter.

In iodine-deficient regions, the mean thyroid volume at any age is significantly higher than in other regions. For many people, goiter is just a cosmetic issue. However, especially in older adults, the goiter may compress the trachea or esophagus or be so large that it delays the recognition of concomitant thyroid cancer.

The role of iodine intake in thyroid cancer is still controversial. Correction of iodine deficiency in papillary thyroid cancer has increased in many countries compared to anaplastic and follicular thyroid cancer. Therefore, it is thought that it will have a positive effect on mortality by reducing the more aggressive subtypes of thyroid cancer.

Hyperthyroidism

Iodine deficiency increases the incidence of nodular goiter. Mild to moderate iodine deficiency is a common cause of toxic multinodular goiter and hyperthyroidism.

Hypothyroidism

Hypothyroidism due to low iodine intake is now rare. Adults with insufficient iodine intake have hypothyroidism, clinical manifestations of hypothyroidism, and often goiter.

Severe iodine deficiency during pregnancy

For the full development of the fetus, it is necessary for the pregnant woman to receive an optimal level of iodine. In the first 12 weeks of pregnancy, the fetus is completely dependent on maternal T4. Between 10-12 weeks of gestation, fetal TSH is synthesized, and the fetal thyroid has the ability to concentrate iodine and synthesize iodothyronines. However, very little hormone synthesis takes place between 18-20 weeks. Continued maternal iodine deficiency during these critical periods of fetal development and after fetal thyroid development leads to persistent

intellectual disability known as hypothyroidism and, in its most severe form, cretinism.

Neonatal and infant mortality

Severe iodine deficiency increases neonatal and infant mortality. This situation is reduced by 50% with adequate Iodine supplementation. The mechanism of this benefit is unknown. Babies who develop hypothyroidism may be more prone to infectious diseases.

Mild to moderate iodine deficiency during pregnancy

The potential adverse effects of mild to moderate iodine deficiency during pregnancy are unclear.

Subclinical neurological defects

Minor neuropsychological defects have been described in children born to mothers exposed to mild to moderate iodine deficiency during pregnancy. These defects can be detected with appropriate neuropsychological testing.

In a UK study, children born to mothers with urinary iodine concentrations below 150 mcg/g during pregnancy had lower verbal intelligence quotient (IQ), reading accuracy, and reading scores than children born to mothers with urinary iodine concentration ≥150 mcg/g. (18)

In Australia, children born to mothers with a urinary iodine concentration <150 mcg/L during pregnancy have had reductions in spelling, grammar and English literacy test scores compared to ≥150 mcg/L at 9 years of age. (19)

Hearing difficulty can also be another clinical sign of iodine deficiency. For example, in a study conducted with 150 school-age children in Spain, goiter was found in 38 percent (20). An inverse relationship between auditory hearing threshold and urinary iodine excretion was seen in children with goiter and mild to moderate iodine deficiency. (ie, the greater the iodine deficiency, the higher the auditory threshold)

What is the treatment?

In iodine deficiency, especially iodized salt should be consumed at the table, and salt should be added to the meal after cooking. The preferred method to increase iodine intake in many societies is iodization of salt. Salt iodination is legally required in many countries (21). Alternatives are needed when salt iodization is not practical. Effective options are iodized oil (Lipiodol), iodized water and iodine tablets or drops. Since water is a daily need like salt, it is an occasional iodine tool (22) It is important to consume seafood, milk and dairy products, which are among the food's rich in iodine. Pills and iodine drops can be given as supplements. People with suspected iodine deficiency should avoid goitrogen foods. These include foods such as cabbage, spinach, soy milk.

Iodine Deficiency Awareness

It is known that 54 countries in the world have iodine deficiency. Since the 1980s, the World Health Organization (WHO) has been struggling with iodine deficiency. In addition to the World

Health Organization, the United Nations Children's Fund (UNICEF) and the International Council for Control of Iodine Deficiency Diseases (ICCIDD) have helped countries in the use of iodized salt. The universal use of iodized salt was adopted in 1993 and October 21st was recognized as the Gobal Iodine Deficiency Disorders Prevention Day.

Global Iodine Deficiency Disorders Prevention Day, Events are held every year with the aim of raising awareness and emphasizing the adequate use of iodine and its results (23).

CONCLUSION

Despite this, iodine deficiency still remains an important issue in society. In order to raise awareness of the society on this issue, more individuals can be reached by mass media and by organizing health education programs in schools.

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