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Analysis of Chest Disease Consultations Requested by an Emergency Unit in Summer and Winter Months

Yaz ve Kış Aylarında Acil Birimi Tarafından Talep Edilen Göğüs Hastalığı Konsültasyonlarının Analizi

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Abstract

Aim: This study aims to show seasonal differences by analysing the chest disease consultations requested by an emergency unit in summer (June, July, and August) and winter (December, January, and February) months.

Material and Method: Patients over the age of 18 years who were directed by an emergency unit to the Department of Chest Diseases between 1 December 2021 and 31 August 2022 and whose thoracic computerized tomography results were available were included in the study. Variables such as the patients' demographic characteristics, complaints, resultsof the examinations done in the emergency unit, hospitalization rates, place of hospitalization (clinical service or intensive care), and pre-diagnosis before hospitalization were evaluated. The statistical significance level was accepted as $p<0.05$ in all calculations and statistical analysis of the data was conducted using IBM SPSS Statistics 26 (IBM Corp., Armonk, NY, USA).

Results: For the 409 patients included in thisstudy,more consultations were requested in the winter months (n=239, 58.4%). We identified significant differencesbetween the seasonal groups in terms of the complaints and the additional radiological imaging findings of patients consulted in summer and winter months ($p<0.05$). The most common complaint in both seasons was shortness of breath. Pleural effusion was less common among the additional radiological findings of both seasons.

Conclusion: This study has revealed significant differencesbetween seasonal groups in terms of complaints and additional radiological imaging findings of patients with consultationsin summer and winter months. However, there were no significant differencesbetween the seasonal groups in terms of age, sex, pre-diagnosis, place of hospitalization, or main radiological findings.

Keywords: Chest diseases, emergency unit, consultation

Öz

Amaç: Bu çalışma, yaz (Haziran, Temmuz ve Ağustos) ve kış (Aralık, Ocak ve Şubat) aylarında acil servis tarafından talep edilen göğüs hastalıkları konsültasyonlarını inceleyerek mevsimsel farklılıkları göstermeyi amaçlamaktadır.

Gereç ve Yöntem: 1 Aralık 2021-31 Ağustos 2022 tarihleri arasında acil servis tarafından Göğüs Hastalıkları Kliniğine yönlendirilen ve toraks bilgisayarlı tomografi sonuçları mevcut olan 18 yaş üstü hastalar çalışmaya alındı. Hastaların demografik özellikleri, şikayetleri, acil serviste yapılan tetkik sonuçları, yatış oranları, yatış yeri (hastane servisi veya yoğun bakım), yatış öncesi ön tanıları gibi değişkenler değerlendirildi. Tüm hesaplamalarda istatistiksel anlamlılık düzeyi $p < 0,05$ olarak kabul edildi ve verilerin istatistiksel analizi IBM SPSS Statistics 26 (IBM Corp., Armonk, NY, ABD) kullanılarak yapıldı.

Bulgular: Bu çalışmaya dahil edilen 409 hasta için kış aylarında daha fazla konsültasyon istendi (n = 239, %58,4). Yaz ve kış aylarında başvuran hastaların şikayetleri ve ek radyolojik görüntüleme bulguları açısından mevsimsel gruplar arasında anlamlı fark saptadık ($p < 0.05$). Her iki mevsimde de en sık görülen yakınma nefes darlığıydı. Her iki mevsimin ek radyolojik bulguları arasında plevral efüzyon daha az görüldü.

Sonuç: Bu çalışma yaz ve kış aylarında konsülte edilen hastaların şikayetleri ve ek radyolojik görüntüleme bulguları açısından mevsimsel gruplar arasında anlamlı farklılıklar ortaya koydu. Ancak yaş, cinsiyet, ön tanı, yatış yeri veya ana radyolojik bulgular açısından mevsimsel gruplar arasında anlamlı fark yoktu.

Anahtar Kelimeler: Göğüs hastalıkları, acil ünite, konsültasyon

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INTRODUCTION

Emergency departments are healthcare units that provide uninterrupted service 7 days a week and 24 hours a day. Accordingly, they are the departments where both emergency patients and other patients receive healthcare services outside of the main working hours. Emergency unitsare the hospital units with the highest numbers of patients and patient diversity. Because of the large variations among cases, emergency physicians might have some cases for which they should consult with doctors of internal medicine or surgical branches. Chest diseases are of particularly great significance among the internal medicine branches, and in some studies, it was found that 0.5-1% of patients presenting to an emergency unit had consultations with the Department of Chest Diseases.[1] In another previous study, among all internal medicine consultations requested by an emergency service, the Department of Chest Diseases ranked second, after the Department of Cardiology.[2] The most common complaint of patients presenting to emergency services and consulting with the Department of Chest Diseases is shortness of breath andthe most common imaging technique used for these patients in the emergency unit is chest radiography. In cases where chest radiography is not sufficient, thoracic computerized tomography is used. The pre-diagnosis of a major portion of patients hospitalized after emergency consultation is requested from the Department of Chest Diseases is pneumonia, asthma attack, or chronic obstructive pulmonary disease (COPD) exacerbation.[3,4]

Especially after the COVID-19 epidemic, although it is essentially a systemic infection, the fact that it causes pneumonia has caused chest diseases to spend more time with these patients than almost the infection department. Therefore, there has been an increase in the workload, especially in recent years. Chest diseases departments also have to spare a significant amount of time for patients who are relatively chronic, recurrent and therefore require a significant workforce. With this workload, we conducted this study in order to determine how and in what way we should allocate time to the emergency departments, and thinking that its contribution to the literature would be meaningful.

As a primary aim we tried to identify any seasonal differences by analysing the chest disease consultation requests made by the emergency unit in summer (June, July, and August) and winter (December, January, and February) months. As the secondary aim, possible differences between summer and winter in terms of demographic data, diagnoses and hospitalization were investigated.

MATERIAL AND METHOD

The study was carried out with the permission of Adıyaman University Ethics Committee (Date: 13.12.2022, Decision No: 2022/9-14). Informed consent was waived from the patients because of the study which was designed as a retrospective study. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Patient Selection

In this study, we included patients treated in the emergency unit of Adıyaman Training and Research Hospital who had consultations with the Department of Chest Diseases between December 2021 and August 2022 based on hospital information management system and patient files. All patients were over the age of 18 years and their thoracic computerized tomography results were available. Together with the demographic data of the patients, such as age and sex, data including the findings of thoracic computerized tomography, pre-diagnosis before hospitalization, and place of hospitalization (hospital ward or intensive care unit) were also analysed. Patients with missing data were excluded from the study.

Statistical Analysis

Descriptive statistics for the categorical variables (demographic characteristics) of the study were evaluatedas frequencies and percentages. The compliance of numerical variables with normal distribution was checked using the Shapiro-Wilk test. Descriptive statistics for numerical variables were given as mean ± standard deviation (x±SD) for normally distributed data and median (min-max) for non-normally distributed data. The Mann-WhitneyU test was used in the comparison of variables without normal distribution between summer and winter months.Then, the relationships between age, gender, pre-diagnosis, and radiological findings were evaluated as categorical variablesPearson chi-square test was determined as statistical test.The statistical significance level was considered as $p<0.05$ in all calculations and statistical analysis of the data was conducted using IBM SPSS Statistics 26 (IBM Corp., Armonk, NY, USA).

RESULTS

The data obtained from 409 patients presenting to the emergency unit were used in this study. The mean age of patients with summer consultations was 75(70.650±17.691) (21-106) years and the mean age of patients with winter consultations was 74 (71.350±15.880) (20-104) years (p= 0.830).While 170 of those emergency patients consulted with the Department of Chest Diseases in summer, 239 of them consulted in winter. In the summer months, 100 (58.8%) of these patients were male and 70 were female; in winter, 135 were male and 104 were female (p= 0.637)(**Table 1**) (**Table 2**).

Table 1.Comparison of demographic information of patients according to the season in which they presented

Variable	Summer		Winter		Chi-square	p
	n	%	n	%		
Sex						
Male	100	58.82	135	56.49	0.222	0.637p
Female	70	41.18	104	43.51		
Complaint						
Fever	16	9.41	31	12.97		
Haemoptysis	10	5.88	11	4.60		
Shortness of breath	69	40.59	125	52.30	12.260	0.016p
Coughing	18	10.59	26	10.88		
Non-respiratory	57	33.53	46	19.25		
Hospitalization						
Yes	106	62.35	144	60.25	0.185	0.667p
No	64	37.65	95	39.75		
Pre-diagnosis						
Asthma	12	11.32	23	15.86		
Bronchiectasis	4	3.77	7	4.83		
COPD	33	31.13	54	37.24	2.194	0.139p
Pneumonia	47	44.34	47	32.41		
Pulmonary thromboembolism	10	9.43	14	9.66		
Place of hospitalization						
Clinical Service	70	66.04	110	75.9	2.914	0.088p
ICU	36	33.96	35	24.1		
Radiological findings-1						
Emphysema	17	10.00	31	12.97		
non-emergency, nonspecific	95	55.88	147	61.51	3.941	0.268p
Embolism	8	4.71	10	4.18		
Consolidation	50	29.41	51	21.34		
Radiological findings-2						
None	146	85.88	226	94.56	9.093	0.003p
Pleural effusion	24	14.12	13	5.44		

P: Pearson chi-square test, COPD: chronic obstructive pulmonary disease, ICU: intensive care unit

Table 2.Comparison of patients' ages according to the season in which they presented

Variable	Summer		Winter		U	p
	Median	Min-Max	Median	Min-Max		
Age	75	21-106	74	20-104	20062.5	0.830

U: Mann-Whitney U test

The most common complaint of the patients consulted in both seasons was shortness of breath at rates of40.6% and 52.3% in summer and winter, respectively, andthe second most common was non-respiratory causes at rates of 33.5% and 19.2%. Patients were mostly hospitalized in the winter months due to a pre-diagnosis of COPD exacerbations (37.2%) and in summer due to pneumonia (%44.3) . In addition, patients were also hospitalized with pre-diagnoses of asthma attacks, bronchiectasis, and pulmonary thromboembolism at varying rates. In the radiological imaging of the patients who consulted in summer and winter, the most common radiological finding was "other"or "non-emergency"at rates of55.8% and 61.5%, respectively. Emphysema, consolidation and pulmonary thromboembolism were seen as radiological findings in summer 10%, 29.4% and 4.7%, respectively. Emphysema, consolidation and pulmonary thromboembolism were seen as radiological findings in winter12.9%, 21.3% and 4.1%, respectively. As an additional imaging finding, pleural effusion was observed in the radiological imaging results of 24 patients who consulted insummer and 13 patients who consulted in winter (p= 0.268) (**Table 1**).

Significant differences were identified between the groups in terms of the complaints and additional radiological imaging findings of patients who consulted in summer and winter ($p<0.05$). The most common complaint was shortness of breath in both seasons, while pleural effusion was observed as an additional radiological finding in 14.1% in summer and 5.4% in winter.(**Table 1**).

Of the 170 patients who consulted in summer, 106 (62.3%) were hospitalized, with 36 of them in the intensive care unit and 70 in clinical service. Of the 239 patients who consulted in winter, 145 (60.2%) were hospitalized, with 35 of them in the intensive care unit and 110 of them in clinical service. Despite the higher mean age of the patients who consulted in summer, no significant difference was observed between the seasons. Proportionately, patients were mostly hospitalized due to pneumonia in summer and due to COPD exacerbations in winter. However, no significant difference was found between the seasons in terms of pre-diagnosis before hospitalization. The highest numbers of consulted patients were hospitalized in clinical service both seasons andno significant difference was found between the seasons. Additionally, there were no significant differences between the seasons in terms of main radiological findings($p>0.05$) (**Tables 1** and **2**).

DISCUSSION

This study was undertaken with the aim of identifying seasonal differences in the chest disease consultations requested by an emergency unit. One of the first notable findings obtained was the higher number of consultation requests in winter months compared to summer months. The unique parameters we evaluated in our study provide important information about the variables between summer and winter periods about the chest diseases consultations requested from the emergency department. We have revealed that there is a significant difference between the complaints of patients who applied to the emergency department in the summer and winter periods and were consulted. We showed that there was no significant difference in parameters of age, gender, hospitalization, pre-diagnosis and radiological findings.

In the study conducted by Dönmez et al.[2] in which the consultation processes in the emergency department were examined, it was determined that male patients were the most frequently consulted in all branches, and the average age of the patients who applied for consultation was 45.[2]Additionally, out

of 147 patients who consulted with the Department of Chest Diseases, 54 (36%) of them were hospitalized.[2] Compared to that study, the present study has some similarities in terms of high numbers of male patients and hospitalization rates. However, the mean age is higher in the present study. The data that we obtained here support the hypothesis that older patients are often treated in the Department of Chest Diseases.

In the study conducted by Begümet al.[1] in which chest diseases consultations requested from the emergency department of a state hospital were examined, it was seen that the average patient age was 72.8, 53.9% of the patients were male, and the most common complaint was shortness of breath.[1] In the same study, it was revealed that 52.7% of the consulted patients were hospitalized, the most common pre-diagnosis was pneumonia, and the most common computerized tomography finding was consolidation.[1] In comparison to that study, the present study has some similarities in terms of age, sex, complaints, and the most frequent pre-diagnosis in summer months. On the other hand, the most important differences between that study and ours are that the most frequent pre-diagnosis in winter was COPD, the most frequent computerized tomography finding was "other"or "non-emergency" findings, and the hospitalization rate was 61.1% in our study.

In a previous study that evaluated the chest disease consultations of hospitalized patients, it was revealed that the mean age of the patients was 62 years, 51.2% of the patients were male, the most frequent complaint was coughing, and the most frequent radiological finding was "other" or "non-emergency". Patients from the emergency unit were not included in thatstudy.[4] In comparison, our patients were similar in terms of sex distribution and radiological findings, but they differed regarding mean age and complaints. We can also conclude that the profile of hospitalized patientstreated by chest disease doctors in the previous study included younger patients who were more stable.

In the study conducted by Emreet al.[5] chest diseases consultations requested from hospitalized patients were evaluated. In this study, the mean age was 64 years, 53.6% of the patients were male, the most common complaint was dyspnea, and the most common radiological imaging finding was "non-emergency nonspecific" and the most common diagnosis was COPD exacerbation.Patients from the emergency unit were not included in thatstudy.[5] In comparison, our study has some similarities in terms of sex distribution, complaints, radiological findings, and winter pre-diagnoses. However, we obtained different results in terms of the mean age of the patients and summer pre-diagnoses.

In the study conducted by Annakkaya et al.[6] in which the chest diseases consultations requested in emergency service and hospitalized patients were evaluated, the mean age was 57, 56.9% of the patients were male, the most common complaint was dyspnea, and the most common radiological imaging finding was "non-urgent, non-specific".[6] Seasonal differences werenot considered in this study.[6] In comparison, our study has some similarities in terms of sex distribution, complaints, and radiological findings. However, the mean age of patients in the previous study was lower compared to ours.

In the study conducted by Balbayet al.[3] when the requested chest diseases consultations in the emergency department and hospitalized patients were evaluated, the mean age of the patients was 62, 65.1% of the patients were male, the most common complaint was dyspnea, and the most common radiological imaging was radiological imaging. appeared to have been done.[3] In comparison, our study has some similarities in terms of sex distribution, complaints, and radiological findings. However, once again, the mean age of patients in our study was higher.

In the study conducted by Arslanet al.[7] in which the consultations requested from the patients hospitalized at the University Hospital were examined, the mean age of the patients was 63 years, 60% of the patients were male, the most common complaint was dyspnea, the most common preliminary diagnosis was COPD, the most common radiological imaging finding was "non-urgent, non-specific". was.[7] Emergency unit patients were not included in that study.[7] In comparison, our study has similarities in terms of sex distribution, complaints, radiological findings, and winter pre-diagnoses. However, the mean age of the mentioned study was lower than ours and we also obtained different results in terms of summer pre-diagnoses.

The present study had several limitations. The retrospective nature of the study and the fact that it was conducted in a single center might have inevitably led to bias in case selection. This resulted in high consultation rates due to co-morbid patients as well as surgical candidates who applied to the emergency department without respiratory complaints. This is an area that requires further evaluation of patients in this group with extensive studies. In addition, studies to be carried out can clearly show how the findings observed in radiological imaging should be evaluated even though they do not cause respiratory complaints. Prospective studies with larger populations are needed. Despite the limitations of this study, it will contribute and guide the studies to be done in the literature in terms of the results of summer and winter periods.

CONCLUSION

In this study, we revealed that there is a significant difference between summer and winter months in terms of complaints and additional radiological imaging findings in the evaluation of consultations requested by the emergency department from the Department of Chest Diseases.At the same time, we found no significant differences between winter and summer in terms of patients' ages, sex distribution, pre-diagnosis before hospitalization, place of hospitalization, and main radiological findings. As far as we know, no other studies have been conducted on this subject to date; therefore, our study will make important contributions to the literature.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Adıyaman University Ethics Committee (Date: 13.12.2022, Decision No: 2022/9-14).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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