

The Value of Ultrasonography, Leukocyte Count and Clinical Results in Diagnosis of Acute Appendicitis and the Duration of Stay of the Patients in Emergency Department

Akut Apendisit Tanısında Ultrasonografi, Lökosit ve Klinik Sonuçların Değerliliği ve Hastaların Acil Serviste Kalış Süreleri

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SUMMARY

Objectives

In this study, we aimed to compare the clinical data of patients diagnosed with acute appendicitis in our center with the literature.

Methods

The patients who were diagnosed with acute appendicitis between 01.10.2010 and 01.10.2011 in Emergency Department of İzmir Bozyaka Training and Research Hospital were included in this study. Patient demographics, dates and times of emergency department application, dates and times of hospitalization in the general surgery ward, duration of stay in the emergency department, leukocyte count and its relationship with age, the perforation rate, the relationship of perforation with age and leukocyte count, and the final diagnosis and ultrasound findings were assessed in this study.

Results

A total of 482 patients who were diagnosed with acute appendicitis [300 (62.2%) male, mean age 30.7±12.03; 182 (37.8%) female, mean age 31.17±13.22] were enrolled. The duration of stay in the emergency department was between 0-6 and 6-12 hours in 320 (66.4%) and 143 (29.7%) patients, respectively. The ultrasonography findings were consistent with acute appendicitis in 366 (75.9%) patients, and the mean leukocyte count of these patients was 13.141/mm³. 46 (9.5%) of the patients were diagnosed with perforated appendicitis. The ultrasonography findings were not consistent with acute appendicitis in 36 (7.5%) patients and the leukocyte counts were less than 11.000/mm³ in these patients.

Conclusions

According to the present study results, acute appendicitis is commonly seen among the young adult male population. The coherence of ultrasonography findings with the diagnosis and its association with leukocytosis is significant and supportive. Additionally, the ultrasonography findings, leukocytosis, medical history and physical examination are important and essential factors for the diagnosis of acute appendicitis. A large number of patients with acute appendicitis were followed-up between 0-6 hours in the emergency department.

Key words: Acute appendicitis; emergency department; general surgery.

ÖZET

Amaç

Bu çalışmada, akut apandisit tanılı hastalarımızla ilgili elde ettiğimiz verileri literatürle karşılaştırmayı amaçladık.

Gereç ve Yöntem

Çalışmamız İzmir Bozyaka Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği'ne 01.10.2010-01.10.2011 tarihleri arasında başvuran ve akut apandisit tanısı almış olan hastaları kapsamaktadır. Çalışmamızda hastaların demografik özellikleri, acil servise başvuru tarih ve saatleri, genel cerrahi servisine yatış tarih ve saatleri, acil serviste kalış süreleri, lökosit değerleri ve yaş ile ilişkisi, perforasyon oranı ve perforasyonun yaş ve lökosit değerleri ile ilişkisi ve alınan tanı ile ultrasonografi bulguları incelendi.

Bulgular

Apendisit tanısı alan 482 hastanın 300'ü (%62.2) erkek, 182'si (%37.8) kadındı. Erkeklerin yaş ortalaması 30.7±12.03 iken kadınların yaş ortalaması 31.17±13.22 idi. Akut apandisit tanısı alan 482 hasta incelendiğinde; bunların 320'si (%66.4) acil serviste 0-6 saat kalırken, 143'ü (%29.7) 6-12 saat kalmıştır. Akut apandisit tanılı 482 hastanın 366'sında (%75.9) ultrasonografi bulguları akut apandisit lehineydi ve bunların da lökosit ortalaması 13.141/mm³ idi. Akut apandisit tanısı alan 482 hastanın 46'sı (%9.5) perforasyonlu apandisit tanısı almıştır. Akut apandisit tanısı alan 482 hastanın lökosit ortalaması 13.044/mm³ bulunmuştur. Akut apandisit tanılı 482 hastanın 36'sında (%7.5) hem ultrasonografi bulguları akut apandisiti desteklememiştir ve hem de lökosit değerleri 11.000/mm³ altında çıkmıştır.

Sonuç

Akut apandisit olgularının daha sıklıkla genç erişkin erkek popülasyonunda görüldüğü sonucuna ulaşılmıştır. Ultrasonografi bulgularının tanı ile uyumu ve lökositoz birlikteliği akut apandisit için anlamlı ve destekleyici bulunmuştur. Lökosit seviyesi ve ultrasonografi bulgularının yanında; anamnez ve fizik muayenenin de önemli ve temel olduğu sonucuna varılmıştır. Akut apandisit tanılı hastaların büyük bir bölümü acil serviste 0-6 saat takip edilmiştir.

Anahtar sözcükler: Akut apandisit; acil servis; genel cerrahi.

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Introduction

Acute appendicitis often presents with subtle symptoms and may be confused with other conditions. However, acute appendicitis is one of the most frequent causes of acute abdominal pain. Among all the emergent intra abdominal operations in the world, appendectomies are the most commonly performed.^[1-4]

The sensitivity of the combination of diagnostic testing, physical examination, and imaging studies in diagnosing acute appendicitis is quite high.^[5-7] Even though these diagnostic studies are noninvasive, their accuracy has been overestimated in several studies.^[4,8] Therefore, performing a thorough history and physical examination remain very important in diagnosing acute appendicitis.^[3,9] Currently, there are no diagnostic tools that when used in isolation would lead to a definitive diagnosis of acute appendicitis.^[10,11] Research is ongoing so to better identify acute appendicitis with laboratory testing that is noninvasive, cost-effective and practical.

The duration of time from diagnosing acute appendicitis in the emergency department (ED) to the operating table has been reported often in the literature. Yet, the time taken to determine a diagnosis of acute appendicitis by an ED physician has not yet been published. In this study, our aim was to compare length of stay in the ED for patients with acute appendicitis, and we assessed these patients' demographic characteristics, clinical outcomes, abdominal ultrasonography results, and leukocyte counts.

Materials and Methods

Our study included patients who presented to the İzmir Boz-yaka Training and Research Hospital Emergency Medicine Clinic between January 10, 2010 and January 10, 2011 that had histologically confirmed diagnoses of appendicitis. This was a retrospective chart review that was evaluated and approved by the educational board of the hospital (meeting No.: 343). Medical records for all patients that presented to the ED within the designated time frame were accessed. Data including patient demographics, date and time of ED presentation, ED length of stay, admission date and time to the general surgery service, leukocyte count, appendix perforation rate, and ultrasound (US) imaging were investi-

gated. Leukocyte count and appendix perforation rate and their relation with patient age were also analyzed.

US imaging results were saved in the hospital database and all images were obtained preoperatively. Various radiologists read the US images as they work shifts that switch daily. The Digi Prince DP-9900 ultrasonography device was utilized for imaging. Total blood count was performed with the LH780 device (Beckman Coulter). A leukocyte count over 11.000/mm³ was defined as leukocytosis. The normal reference leukocyte count in our hospital laboratory ranged between 4.300-10.300/mm³.

Statistical analysis

Data were recorded and analyzed with Microsoft Office Excel 2007 and SPSS version 15.0 (SPSS Inc, Chicago). Categorical data was described as the quantity "n" and percentages, whereas continuous data were expressed as the mean \pm one standard deviation with the range (minimum value-maximum value). Pearson's test and the chi-squared test were used to compare categorical data between groups, and the Kolmogorov-Smirnov test and Mann-Whitney U-test were used to compare groups of continuous variables that were not normally distributed.

Results

Of the 482 patients that were diagnosed with acute appendicitis, 62.2% were male and the mean age of the entire study sample was 30.88 \pm 12.48 years. The average age of the male patients was 30.7 \pm 12.03 years, and the average age of the female patients was 31.17 \pm 13.22 years. Most of the patients were between 20-29 years-old, and 38% of the study subjects fell within this age range.

The length of ED stay was 0-6 hours for 66.4% of the patients and the remaining 29.7% stayed in emergency department for 6-12 hours. The mean ED length of stay was 5.45 \pm 3.46 hours. The average length of stay in the ED for patients with a perforated appendix was 5.58 \pm 4.33 hours, whereas the mean length of stay for patients without a perforated appendix was 5.44 \pm 3.36 hours (p=0.992, Table 1).

US examination results supported a diagnosis of acute appendicitis in 75.9% of patients. In 77.2% of patients, both

Table 1. The average length of ED stay of the patients according to the perforation status of appendix

Perforation	n	%	Mean \pm SD (hour)	Min	Max	p
Yes	436	90.5	5.44 \pm 3.36	0.22	22.28	0.992
No	46	9.54	5.58 \pm 4.33	0.36	28.83	
Total	482	100	5.45 \pm 3.46	0.22	28.83	

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