

### Evaluation of Female Patients of Childbearing Age Who Applied to the Emergency Medicine Department with Abdominal Pain

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#### Abstract

**Objective:** Abdominal pain, which has etiological diversity, is associated with an increasing number of patients in emergency departments. Early recognition of its life-threatening causes is important. This study aims to evaluate the diagnoses of female patients of reproductive age who presented with non-traumatic abdominal pain.

**Material and Methods:** A prospective, cross-sectional study was conducted by including demographic and clinical information of women aged 18-50 years who presented to the emergency department of a tertiary hospital between March and September 2020 with non-traumatic abdominal pain.

**Results:** A total of 167 women with non-traumatic abdominal pain were included in the study. The most common presenting complaint was nausea-vomiting (41.3%), and the average duration of symptoms was 24 hours. Physical examination revealed abdominal tenderness in 74.9% of patients. During diagnosis, blood, urine, and stool tests were requested for 95.2% of patients, and imaging tests such as erect abdominal radiograph, ultrasound, magnetic resonance, or computed tomography were requested for 61.7% of patients. The most common diagnosis was urinary tract infection, accounting for 24% of cases.

**Conclusion:** In addition to identifying the pathological condition causing abdominal pain, accompanying comorbidities and history of previous surgery must be investigated. Imaging tests play a crucial role in reaching the correct diagnosis. However, they also seen as a means of reducing emergency department overcrowding, hospitalization, and the need for surgical treatment.

**Keywords:** Childbearing Age, Emergency Medicine, Non-Traumatic Abdominal Pain, Women

#### Introduction

Abdominal pain is one of the most important symptoms that compel patients to seek hospital care in all populations. It has a broad etiological spectrum (1). A comprehensive approach based on demographic data such as age and gender, along with patient history, physical examination, and diagnostic tests, is required to determine the underlying pathological condition (2). Abdominal pain is a common condition in women of childbearing age, and determining the underlying cause is often challenging. However, the location and characteristics of the pain can serve as a starting point for initial diagnosis in the emergency department.

Therefore, advanced diagnostic tests and examinations, conducted by the recommendations of the American College of Radiology after patient stabilization, enable us to reach a diagnosis (3). This will help in the early diagnosis of diseases with high mortality and morbidity rates, as well as in determining the appropriate diagnosis and treatment methods. Despite technological advances, patient management remains one of the most important clinical problems in emergency departments. In particular, patients with non-specific abdominal pain, for whom a definitive diagnosis cannot be made despite the use of all diagnostic methods, continue to constitute a significant proportion (35-40%) of cases (4). This study aims to evaluate the diagnosis and

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follow-up process of women of childbearing age who presented to the emergency department of a tertiary hospital with non-traumatic abdominal pain.

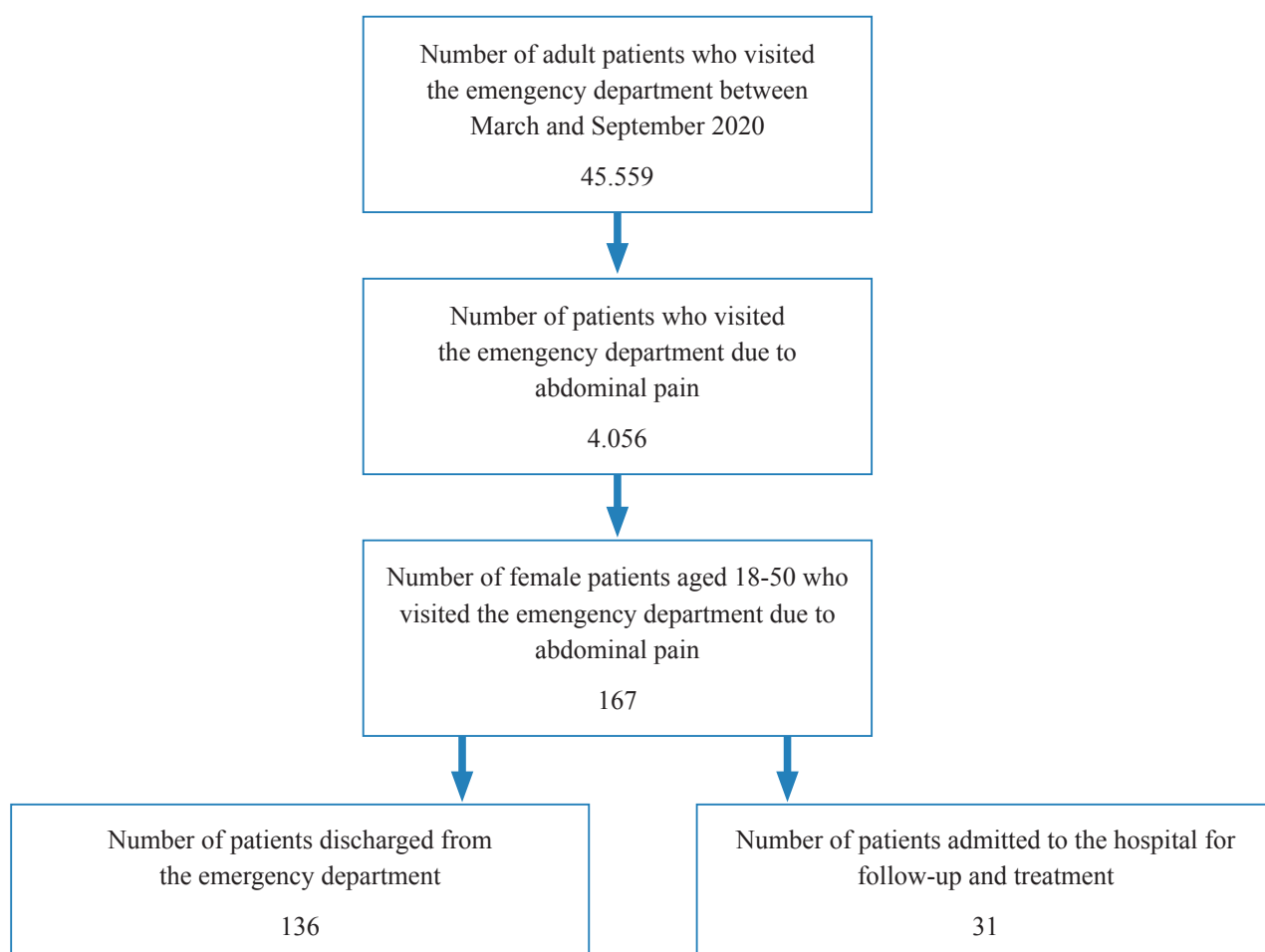
## Material And Methods

**Study design:** This study was conducted at a tertiary hospital with approximately 150,000 emergency department visits per year. Women aged 18–50 years of reproductive age who presented to the emergency department between March and September 2020 with non-traumatic abdominal pain were included in the study after obtaining informed consent. The study was approved by the local ethics committee (Date: 11.03.2020, No: 2020/38) and conducted by the principles outlined in Helsinki Declaration. Emergency residents (ER) managed women patients presenting with abdominal pain in the emergency department, categorized during triage, and evaluated by the attending physician. They stabilized after determining their acute care and resuscitation needs. ER transferred them to the appropriate area for further care.

**Study data:** The data of the patients included in the study (age, gender, complaints, family history, vital

signs, and physical examination findings), their clinical conditions, blood and imaging tests, preliminary and final diagnoses, follow-up areas, outcomes, and treatments (medical or surgical) applied according to their diagnoses were recorded in a pre-established study form. Patients whose clinical condition was unstable at the time of admission or during emergency department follow-up were provided with resuscitation care and followed up in the Intensive Care Unit. Patients under the age of 18, women over the age of 50, patients with trauma-related abdominal pain, and patients who could not provide informed consent were excluded from the study.

**Data analysis:** The sample size of the study was calculated with a test power of at least 80% and a type I error of 5% for each variable. The Kolmogorov-Smirnov test ( $n > 50$ ) was used to determine whether continuous variables were normally distributed; nonparametric tests were applied since they were not normally distributed. Descriptive statistics for continuous variables in our study were expressed as mean, standard deviation, median, minimum, and maximum values. For categorical variables, they were expressed as numbers and percentages. The Mann-Whitney U test was used to compare measurements according to admission and operation groups. Spearman



**Figure 1.** Flow chart diagram.

**Table 1.** Demographic characteristics, accompanying symptoms, and physical examination findings of reproductive-aged women presenting with abdominal pain, along with diagnostic tests requested.

Variable	% (n)
<b>Age (years), median (IQR)</b>	31 (24-37)
<b>Medical history</b>	%22.8 (38)
History of surgery	%8.4 (14)
Hypertension	%7.8 (13)
Diabetes mellitus	%3.6 (6)
Asthma	%3 (5)
Ureteral stone	%1.8 (3)
Colon polyp	%1.8 (3)
<b>Family history of diseases</b>	%6.6 (11)
Diabetes mellitus	%4.8 (8)
Hypertension	%4.2 (7)
Ureteral stone	%1.2 (2)
<b>The time between the onset of symptoms and presentation to the emergency department (hours), median (IQR)</b>	24 (6-48)
<b>Complaints accompanying abdominal pain</b>	
Nausea-vomiting	%41.3 (69)
Pelvic pain	%15.6 (26)
Heartburn	%11.4 (19)
Dysuria	%10.8 (18)
Diarrhea	%10.8 (18)
<b>Physical examination findings at the presentation</b>	%80.8 (135)
Tenderness	%74.9 (125)
Rebound	%18 (30)
Defense	%16.2 (27)
Costovertebral angle tenderness	%8.4 (14)
<b>Laboratory Tests</b>	
Complete blood count	%93.4 (156)
Biochemistry	%92.8 (155)
B HCG	%73.1 (122)
Complete urine analysis	%62.3 (104)
Coagulation	%22.2 (37)
Cardiac biomarkers	%10.8 (18)
Blood gas	%3.6 (6)
Stool analysis	%3.6 (6)
<b>Imaging Tests</b>	%61.7 (103)
Computed tomography	%35.3 (59)
Ultrasound	%32.9 (55)
Erect abdominal X-ray	%15.6 (26)
Magnetic resonance	%4.8 (8)

correlation coefficients were calculated to determine the relationships between measurements. The Chi-square test was used to determine the relationship between categorical variables. The Z-ratio test was used for proportional

comparisons between “Preliminary Diagnosis” and “Diagnosis.” The statistical significance level ( $\alpha$ ) was set at 0.05 for calculations, and SPSS (IBM SPSS for Windows, version 24) and Minitab (Statistical Software for Windows, version 17) statistical software packages were used for the calculations.

## Results

During the study period, 40,569 adult patients presented to the emergency department, of whom 4,056 (8.9%) presented with abdominal pain. Among this group, 167 women aged 18–50 years of reproductive age with abdominal pain were included in the study (Figure 1).

**Demographic characteristics, presenting complaints, physical examination findings, and requested tests:** The median age of the 167 female patients included in the study was 31 (IQR 18–48), and 38 (22.8%) had a history of any disease that could cause comorbidity. Of these, 14 (8.4%) had a history of previous surgical intervention, 13 (7.8%) had hypertension, and 6 (3.6%) had diabetes mellitus. In their family history, 8 (4.8%) had diabetes mellitus and 7 (4.2%) had hypertension (Table 1). The most commonly reported associated symptoms by the patients included nausea-vomiting in 69 (41.3%), pelvic pain in 19 (11.4%), and dysuria in 18 (10.8%). The median time between the onset of the presenting complaint and presentation to the emergency department was 24 hours (IQR, 6–48 hours). Vital signs were stable at the presentation. Physical examination revealed abdominal tenderness in 125 (74.9%), rebound tenderness in 30 (18%), and abdominal guarding in 27 (16.2%) patients. Laboratory tests were requested for 159 (95.2%) patients, and imaging studies were requested for 103 (61.7%) patients. Among laboratory tests, the most common were complete blood count (156, 93.4%), biochemical tests (155, 92.8%),  $\beta$  HCG 122 (73.1%) were performed, while imaging tests included computed tomography 59 (35.3%), ultrasound 55 (32.9%), and erect abdominal X-ray 26 (15.6%) (Table 1).

**Patients’ preliminary diagnosis, diagnosis, and follow-up areas:** Based on patients’ complaints and physical examinations, the preliminary diagnosis in the emergency department was urinary tract infection in 34 (20.4%), nonspecific abdominal pain in 33 (19.8%), and acute gastroenteritis in 17 (10.2%); the final diagnoses revealed urinary tract infection in 40 (24%) patients, nonspecific abdominal pain in 28 (16.8%) patients, and acute gastroenteritis in 19 (11.4%) patients. When evaluating the relationship between initial diagnosis and definitive diagnosis, greater agreement was observed in patients with suspected acute appendicitis and renal colic ( $p = 0.049$ )

**Table 2.** Preliminary diagnosis and diagnosis in the emergency department

	Preliminary Diagnosis % (n)	Final Diagnosis % (n)
Urinary Tract Infection	%20.4 (34)	%24 (40)
Nonspecific Abdominal Pain	%19.8 (33)	%16.8 (28)
Acute Gastroenteritis	%10.2 (17)	%11.4 (19)
Acute Appendicitis	%9.6 (16)	%4.2 (7)
Renal Colic	%9.6 (16)	%4.2 (7)
Peptic Ulcer	%8.4 (14)	%6.6 (11)
Ovarian Cyst	%4.8 (8)	%6 (10)
Acute Cholecystitis	%4.8 (8)	%1.8 (3)
Dysmenorrhea	%3.6 (6)	%3.6 (6)

(Table 2). Thirty-one patients (18.6%) were admitted for further management and treatment, with the most common departments being General Surgery (n = 14, 8.4%) and Obstetrics and Gynecology (n = 10, 6%). No deaths were reported among the patients following discharge from the emergency department or after treatment in the admitting department.

There was a statistically significant difference between the rates of hospitalization for treatment among patients presenting with abdominal pain accompanied by nausea-vomiting, dysuria, diarrhea, and constipation. The mean age of hospitalized patients was higher than that of patients treated on an outpatient basis ( $p = 0.012$ ). When laboratory tests were examined in this group, statistically significant differences were also found in glucose, CRP, leukocyte count, CK-MB, troponin, APTT, PT, INR, and the presence of ketones in the complete urine analysis (CUA) ( $p < 0.05$ ) (Table 3).

Surgical treatment was applied to 17 (10.2%) of the hospitalized patients. The mean age of the group that underwent surgical treatment was higher than that of the group that received medically treated. Laboratory test results showed that glucose, sodium, potassium, leukocyte, CK-MB, troponin, APTT, PT, and INR values were also higher in the group that underwent surgical treatment ( $p = 0.05$ ) (Table 3).

## Discussion

Non-traumatic abdominal pain is one of the most common complaints that cause patients to seek emergency care. During the six months of the study, non-traumatic abdominal pain accounted for 8.9% of all visits, and 4.11% of this patient group consisted of women of childbearing age. Data obtained from studies determining the overall burden of abdominal pain on emergency department visits were consistent with these findings (5, 6).

**Table 3:** Factors associated with age, diagnosis, laboratory findings, and treatment in hospitalized patients

Variable	Mean $\pm$ Std. Dev.	p
<b>Patients hospitalized for follow-up and treatment (n=31)</b>		
Age	34.61 $\pm$ 7.89	0.012
Glucose	108.32 $\pm$ 25.94	0.027
CRP	30.57 $\pm$ 72.45	0.010
Leukocyte	10.35 $\pm$ 3.58	0.002
CK-MB	24 $\pm$ 45	0.003
Troponin-I	88 $\pm$ 1.55	0.002
APTT	13.05 $\pm$ 14.00	<0.001
PT	6.73 $\pm$ 7.10	<0.001
INR	0.50 $\pm$ 53	<0.001
Presence of CUA-ketone	0.03 $\pm$ 0.18	0.036
<b>Patients who underwent surgical treatment (n=17)</b>		
Age	35.94 $\pm$ 8.25	0.018
Glucose	113 $\pm$ 17.89	0.048
Sodium	137.41 $\pm$ 1.54	0.033
Potassium	4.30 $\pm$ 0.37	0.047
Leukocyte	10.58 $\pm$ 3.49	0.012
CK-MB	0.28 $\pm$ 0.49	0.008
Troponin-I	0.94 $\pm$ 1.50	0.010
APTT	17.60 $\pm$ 13.89	<0.001
PT	9.06 $\pm$ 6.95	<0.001
INR	0.68 $\pm$ 6.20	<0.001

Demographic data such as age and gender, as well as medical history, symptoms, findings, and physical examination, are guiding factors in the differential diagnosis of the pathological condition causing abdominal pain (7). The history of comorbidities and other complaints in the medical history is significant in terms of preliminary diagnosis and planned tests. In this study, 8.4% of patients had a history of surgery, and the presence of additional symptoms such as nausea and vomiting in this patient group is important for the early diagnosis and treatment of diseases with high mortality and morbidity requiring surgical intervention (8). Additional symptoms accompanying abdominal pain may vary depending on the study population but are indicative (9).

Physical examination findings in patients play a role in the diagnosis. In this study, abdominal tenderness was the most common finding on physical examination, which was consistent with other studies in the literature (10,11). However, there were some differences in the proportions. This difference is due to the subjective nature of tenderness. Although the combined use of medical history, physical examination, and laboratory tests may seem insufficient for reaching a correct diagnosis, it is effective in selecting imaging tests and determining unstable



conditions with high mortality (12, 13). Here, laboratory tests were requested for 95.2% of patients based on their current condition, and imaging tests were requested for 61.7% of patients based on the findings obtained. Despite the widespread use of technological imaging techniques in recent years to prevent mortality and morbidity, plain abdominal radiographs are still the preferred method in patients with abdominal pain (14). In our study, they were used in patients presenting with constipation and in those with a suspected diagnosis of obstruction.

Computed tomography (CT) is recommended for the evaluation of patients with acute abdominal pain due to its high diagnostic accuracy and its ability to provide alternative diagnoses when the suspected diagnosis is not confirmed (15). Here, CT is the most frequently requested imaging method, although it differs from literature data (16, 17). This is primarily because, despite its ease of use at the bedside in the emergency department, ultrasound is user-dependent, prone to gas artifacts, and access to radiologists is often limited, resulting in lower usage rates compared to computed tomography (CT). Additionally, the high sensitivity and specificity of CT in acute abdominal syndromes reduce emergency department stay duration and prevent unnecessary surgical intervention, thereby increasing its preference (17).

Despite technological advances in laboratory and imaging methods used in the diagnostic phase, nonspecific abdominal pain remains one of the leading diagnoses (18, 19). In this study, it accounted for 19.8% of preliminary diagnoses and 16.8% of definitive diagnoses. In studies conducted on patients who presented to the emergency department with non-traumatic abdominal pain, the most common specific diagnosis reported was urinary tract infection (20). In our study, urinary tract infections were detected in 24% of cases, which is consistent with previous findings (21). However, differences in other diagnoses were observed, which we attribute to the study population. There was an agreement between the preliminary diagnoses based on the patient's histories and physical examinations and the definitive diagnoses determined after the tests in cases of acute appendicitis and renal colic. The relationship between the diagnoses varied by 33% and was similar to that reported in the literature (22).

Patients who presented to the emergency department with abdominal pain were discharged for outpatient follow-up after their symptoms subsided following symptomatic treatment, while some were admitted to different clinics (23). Here, 18.6% of patients were hospitalized for follow-up, and 10.2% were treated with surgical methods. The higher number of patients managed as outpatients compared to those admitted for inpatient care, or surgical treatment is primarily due to the increased diagnosis of nonspecific abdominal pain. The General Surgery and

Obstetrics and Gynecology Clinics frequently admitted patients who underwent surgical treatment. In this patient group, age, inflammatory markers, and coagulation parameters were found to be higher than in those who were followed up on an outpatient basis and received medical treatment. This suggests that the patients had high mortality and morbidity rates, which led to their presentation to the emergency department.

## Conclusion

During the diagnosis of pathological conditions causing abdominal pain, demographic characteristics, medical history, and physical examination are as important as laboratory and imaging tests in reaching the correct diagnosis. Comorbid conditions and history of previous surgeries must be thoroughly investigated. The use of technological imaging tests is viewed as a potential route in crowded emergency departments, particularly in terms of avoiding hospitalization and surgical treatment. However, the fact that our study was conducted in a single center with a small number of patients over a six-month period, during which the COVID-19 pandemic had a significant impact on the entire world, resulted in limited data.

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