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# Evaluation and Treatment of Acute Abdominal Pain in the Emergency Department

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## ABSTRACT

*Introduction: The aim of this study was to improve accurate diagnosis and higher quality of treatment in patients with acute abdominal pain.*

*Methods: 350 patients with acute abdominal pain (AP) referred to emergency department (ED) of Baqiyatallah Hospital were studied during the last three months of 2016. For each patient, the form of hospitalization was completed and symptoms, location of pain, pain intensity, gender and age were recorded.*

*Results: Of the 350 patients, 168 cases (48%) were male and 182 (52%) were female. In addition, 84 cases (24%) were ultimately diagnosed with acute surgical pain and required action was taken. The most common cause of surgical acute paint was obtained appendicitis with 29 cases (34.53%) and the least cases were pancreatitis. Authors showed that AP was diagnosed in 266 (76%) patients as an internal source, most cases referred to ED with pain in right lower quadrant (RLQ) 134 cases (10.5%) and the least cases with diffuse pain (7 cases) (2%). The most frequent causes of AP in patients was kidney stone disease 27 cases (10.5%), and the lowest cause was herpes zoster with one case (0.38%), hypothyroidism and etc.*

*Conclusion: The frequency of the causes of surgery acute AP was similar to reviewed studies.*

**Key words:** Acute abdominal pain, Emergency medicine, Patients with immune deficiency, Diagnostic methods

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## INTRODUCTION

Abdominal pain (AP) includes over 10% of all emergency department (ED) chief complaint, [1] and also, AP is the most reason for referring to the Emergency Medicine Department [2]. Acute AP is often explained as pain for maximum 5 days. It can be presented with a variety of conditions ranging from mild and self-limiting to life-threatening disease [3].

An early and accurate diagnosis may lead to better management and improve outcomes [3]. The underlying cause of acute abdomen has many differential diagnoses such as gynecology, surgery, internal medicine, and urology [4]. But it is evaluated generally in two categories: surgical acute AP and internal causes of acute AP.

It is often a symptom of serious disease and misdiagnosis may lead to irreparable injuries [2]. Identification of accurate diagnosis is based on accurate medical history, proper physical examination and choosing appropriate laboratory tests and imaging [4]. Therefore, the aim of this study was to improve accurate diagnosis and higher quality of treatment, so may help to decrease unnecessary operation in patients with acute abdominal pain.

## MATERIALS AND METHODS

### Ethical consideration

Ethical clearance was obtained from the research ethic committee, Bagiatallah University. Informed consent is obtained from the all patients that participate in this research. All patients' identifications and data will be kept confidential.

### Participants

In this cross sectional reviewed 350 patients with acute AP referred to ED of Bagiatallah hospital from October to December of 2016. Triage is the first clinical step in management of all patients that inter to Emergency Department. All individuals referred to ED, first became to triage and completed triage form for them with an expert

nurse, which include the chief complaint, age, gender, date and vital sign. Each patient visited with emergency medicine specialist and those with acute abdominal pain were admitted to observed care unit. The form of hospitalization was completed for each patient, symptoms, location of the pain, pain intensity, gender, age and physical exam like presence of tenderness or rebound tenderness were recorded. After examination, the necessary diagnostic tests or imaging such as ultrasound or radiography or computed tomography (CT) scan were requested. In this stage diagnosis of acute surgical abdominal pain or acute internal abdominal pain were defined and appropriate order were recorded for each patient. Early surgical consultation was done as indicated. Patients with acute surgical abdominal pain transferred to operating room. Those with internal cause of abdominal pain were observed in internal or gynecological or urological wards, and proper treatments were done for them. Patient's statuses were followed up to discharge and necessary surgical or internal procedures were recorded.

### Statistical analysis and sample size collection

Statistical analyses were performed with commercially available software (SPSS ver. 23; SPSS Inc, Chicago, IL, USA). Demographics [sex (percentage)], age (range and percentage), region of abdominal pain (percentage), causes of internal acute abdominal pain (percentage), diagnostic tests were analyzed using non parametric tests and qualitative data were given as frequencies and evaluated using chi-square tests.

## RESULTS

In this study, the mean ages of men were 37.79 years and the mean ages of women were 54.11 years. Among 350 patients, 168 cases (48%) were male and 182 (52%) were female. 84 cases (24%) were ultimately diagnosed as an acute surgical abdominal pain and transferred to operating room. The most anatomical region of acute abdominal pain was in RLQ [37 cases (10.5%)], and the least regional pain was in left upper quadrant (LUQ) [3 case (0.85%)]. The most common cause of surgical acute pain was appendicitis with 29 cases (34.53%) and the least cause was pancreatitis (2 cases). 266 (76%) patients were diagnosed as an internal cause of abdominal pain, the most cases referred to emergency department had RLQ pain [134 patients (36%)], and the least cases had diffuse abdominal pain (7%). The most frequent causes of internal abdominal pain was renal stone disease [27 cases (12.9%)] and the least one was herpes zoster (0.38%), hypothyroidism and so one (Tables 1-9).

**Table 1: Frequency table of admitted patients with acute abdominal pain to baqiyatallah hospital ED**

| Months | Referred patients | Admitted patients | Excluded patients | Included patients |
|---|---|---|---|---|
| October | 6800 | 122 | 3 | 119 |
| November | 6200 | 116 | 2 | 114 |
| December | 6400 | 121 | 4 | 117 |
| **Total** | 19400 | 359 | 9 | 350 |

**Table 2: Frequency table of sex in admitted patients with acute abdominal pain**

| Title | October | November | December | Percentage | Total |
|---|---|---|---|---|---|
| Male | 57 | 55 | 56 | 48% | 168 |
| Female | 62 | 59 | 61 | 52% | 182 |
| Percentage | 34% | 32.57% | 33.42% | - | - |
| **Total** | 119 | 114 | 117 | 100% | 350 |

**Table 3: Ratio of surgery in admitted patients with abdominal pain**

| Title | October | November | December | Total |
|---|---|---|---|---|
| Frequency | 28 | 26 | 30 | 84 |
| Percentage | 23.53% | 22.81% | 25.64% | 24% |

**Table 4: Ratio of admitted patients with internal causes of abdominal pain**

| Title | October | November | December | Total |
|---|---|---|---|---|
| Frequency | 91 | 88 | 87 | 266 |
| Percentage | 76.47% | 77.19% | 74.36% | 76% |

**Table 5: Frequency table of surgical cause of abdominal pain by regional divided**

| Quarter (area) of the abdomen | RLQ | RUQ | LUQ | LLQ | Generalized | Total |
|---|---|---|---|---|---|---|
| Frequency | 37 | 34 | 3 | 4 | 6 | 84 |
| Surgical ratio | 44.05% | 40.48% | 3.57% | 4.76% | 7.14% | 100% |
| Admitted ratio | 10.57% | 9.72% | 0.85% | 1.14% | 1.72% | 24% |

RLQ: Right Lower Quadrant, RUQ: Right Upper Quadrant, LUQ: Left Upper Quadrant, LLQ: Left Lower Quadrant

**Table 6: Frequency table of internal causes of abdominal pain by regional divided**

| Abdominal region | RLQ | RUQ | LUQ | LLQ | Generalized | Total |
|---|---|---|---|---|---|---|
| Frequency | 134 | 39 | 25 | 66 | 7 | 266 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Internal causes ratio | 50.38% | 14.66% | 7.52% | 24.81% | 2.63% | 100% |
| Admitted ratio | 38.29% | 11.14% | 0.71% | 18.86% | 2% | 76% |

**Table 7: Frequency table of causes of surgical acute abdominal pain**

| Causes | October | November | December | Total | Percentage |
|---|---|---|---|---|---|
| Appendicitis | 9 | 9 | 11 | 29 | 34.53% |
| Cholecystitis | 5 | 5 | 6 | 16 | 19.05% |
| Inguinal Hernia | 2 | 2 | 0 | 4 | 4.76% |
| Obstruction | 3 | 4 | 6 | 13 | 15.48% |
| Umbilical Hernia | 1 | 1 | 0 | 2 | 2.38% |
| Perforated PU | 2 | 2 | 2 | 6 | 7.14% |
| Ischemic Cholitis | 1 | 1 | 1 | 2 | 2.38% |
| Ovarian Cyst | 1 | 2 | 1 | 4 | 4.76% |
| Pancreatitis | 1 | 0 | 1 | 2 | 2.38% |
| Uterus Fibroid | 1 | 0 | 1 | 2 | 2.38% |
| Blunt Trauma | 1 | 0 | 1 | 2 | 2.38% |
| Diverticulitis | 1 | 1 | 0 | 2 | 2.38% |
| **Total** | 26 | 28 | 30 | 84 | 100% |

**Table 8: Frequency table of internal causes of acute abdominal pain**

| Causes | October | November | December | Total | Percentage |
|---|---|---|---|---|---|
| UTI | 7 | 5 | 6 | 18 | 6.77% |
| Renal Stone | 9 | 10 | 8 | 27 | 10.15% |
| Ileus | 8 | 7 | 8 | 23 | 8.65% |
| Lead Poising | 6 | 5 | 5 | 16 | 6.02% |
| Unknown Pain | 6 | 5 | 5 | 16 | 6.02% |
| G.E | 6 | 6 | 5 | 17 | 6.39% |
| IBD | 1 | 1 | 0 | 2 | 0.75% |
| Herpes Zoster | 0 | 0 | 1 | 1 | 0.38% |
| C.B.D Stone | 3 | 3 | 4 | 10 | 3.76% |
| Liver Abscess | 0 | 1 | 0 | 1 | 0.38% |
| Fecal Impaction | 4 | 3 | 4 | 11 | 4.14% |
| Non Operable Ovarian Cyst | 3 | 4 | 3 | 10 | 3.76% |
| Cholelithiasis | 2 | 3 | 2 | 7 | 2.63% |
| Pancreatitis | 2 | 2 | 3 | 7 | 2.63% |
| Diverticulitis | 5 | 3 | 4 | 12 | 4.51% |
| Adenitis Mesenterica | 2 | 3 | 2 | 7 | 2.63% |
| Cholangitis | 3 | 2 | 2 | 7 | 2.63% |
| Uterus Fibroid | 4 | 3 | 3 | 10 | 3.76% |
| Ischemic Colitis | 2 | 2 | 1 | 5 | 1.88% |
| Non Operable Umbilical Hernia | 2 | 1 | 2 | 5 | 1.88% |
| Hepatitis | 2 | 1 | 3 | 6 | 2.26% |

| | | | | | |
|---|---|---|---|---|---|
| Pneumonia | 2 | 2 | 1 | 5 | 1.88% |
| Mittelschmersz | 3 | 2 | 2 | 7 | 2.63% |
| ACS | 2 | 2 | 3 | 7 | 2.63% |
| Gastritis | 2 | 2 | 2 | 6 | 2.26% |
| Mesenteric Ischemia | 2 | 3 | 1 | 6 | 2.26% |
| Aneurism Aorta | 1 | 0 | 1 | 2 | 0.75% |
| Post Operation Pain | 1 | 2 | 2 | 5 | 1.88% |
| Pericarditis | 0 | 1 | 2 | 3 | 1.13% |
| GIST | 0 | 1 | 0 | 1 | 0.38% |
| Hypothyroidism | 0 | 1 | 1 | 2 | 0.75% |
| Testis Torsion | 1 | 0 | 1 | 2 | 0.75% |
| Volvulus | 0 | 1 | 0 | 1 | 0.38% |
| Peritonitis | 0 | 1 | 0 | 1 | 0.38% |
| **Total** | 91 | 88 | 87 | 266 | 100% |

**Table 9: Frequency table of diagnostic test**

| Number | Title | Frequency |
|---|---|---|
| 1 | Fast Ultrasound | 160 |
| 2 | Endoscopy | 15 |
| 3 | ERCP | 10 |
| 4 | Special Lab Test | 350 |
| 5 | Lead Level | 30 |
| 6 | Abdominopelvic CT | 35 |
| 7 | ECG | 50 |
| 8 | Echocardiography | 15 |
| 9 | CXR | 270 |

## DISCUSSION

The etiology of AP in patients that referred to ED is variable and challenging. Appropriate history and complete examination as well as proper imaging could help physicians to diagnosis and so provide treatment, although decreased differential diagnosis. Acute AP management is the need to hospitalization because of required resources such as ultrasound or laboratory tests. Diagnosis is challenging due to a wide range of causes, including cardiac problems, malignancy, mechanical obstruction, gastrointestinal infections or ischemia [5,6]. Symptoms presenting and physical examination in elderly or children or immunocompromised patients are atypical or different and diagnosis may be difficult [5,7,8]. Discovering of "Red flags" in the history or physical findings plus proper imaging and lab tests may help physicians to identify serious acute abdominal pain [2,5] clinicians often administer medication for pain relief because several studies explained that analgesic does not affect diagnosis or treatment in ED patients [5,9]. If the history and physical examination indicated a high probability of a disease, negative laboratory tests or imaging cannot exclude the diagnosis, for example leukocytosis may be absent in serious acute abdominal pain such as appendicitis or cholecystitis. Plain abdominal radiographs had limitation for evaluation of acute abdominal pain, but it was useful for diagnosis of intraperitoneal air, calcified aneurysm, and air fluid level in bowel obstruction [2].

## CONCLUSION

In this study, we assessed patients with abdominal pain that referred to ED. Finally 24% of patients with abdominal pain transferred to the operating room for surgery. The most common cause of surgery was appendicitis and cholecystitis and obstruction, the least common cause of surgery was uterus fibroid and diverticulitis. The cause of the internal disease that leads to abdominal pain was renal stone, urinary tract infection (UTI), and hypothyroidism.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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