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Findings on ultrasonography in patients with severe right iliac fossa pain

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Abstract

Background: One of the most prevalent reasons that patients present to the emergency department (ED) is pain in the right iliac fossa, or RIF.

Objective: This study's goal was to use ultrasonography to evaluate the possible causes of acute RIF pain.

Materials and Methods: This cross-sectional study was carried out from July 2023 to December 2023 at the Tikrit Teaching Hospital. Seventy-five (75) patients in all arrived at the ED complaining of severe pain in the RIF. US was performed on the patients utilizing transducers operating at 6 and 11 MHz with end cavitory probe in some female patients. Women who were late in their pregnancies and those with known malignancy were excluded.

Results: A total of 75 individuals that initially complained of pain in the RIF underwent clinical and sonographic examinations. Twelve cases (16%) yielded no results; in contrast, eighteen patients (24%) had appendicitis; ovarian cysts (20%), right lower ureteric stones (16%), and pelvic inflammatory illness (8%). The RIF's pain-causing disease distribution was significantly influenced by age and gender ($P = 0.04$).

Conclusion: Several abnormalities that induce pain in the RIF were present in addition to appendicitis. In the RIF, the most common causes of pain after appendicitis were lower ureteric stones and ovarian cysts. For acute right iliac fossa pain, especially in young females, US is necessary before undergoing any surgery.

Keywords: Iliac fossa pain, findings, appendicitis, ultrasonography

Introduction

Right iliac fossa pain frequently brings patients to the emergency room. While appendicitis is the most frequent surgical emergency, the right iliac fossa pain can have a variety of causes that should be taken into account while evaluating these patients^[1, 2]. Particularly in younger patients, ultrasonography is usually advised as the primary imaging modality for the evaluation of acute right iliac fossa pain^[1, 2, 3]. It can also frequently be used to identify the source of discomfort for these individuals.

The ultrasound (US) can show a variety of etiologies of RIF pain, including ruptured ectopic pregnancy, appendicitis, lower ureteric stones, and pelvic inflammatory disease (PID). The diagnosis is made more difficult by the presentation, which is frequently nonspecific and has a broad differential^[7].

When evaluating a number of disorders that cause RIF pain, US is useful. It is a noninvasive, biologically-effectuating imaging method that is safe, precise, sensitive, and accurate. In this study, a range of diseases causing pain in the RIF are assessed using US. Studies have shown that US has a sensitivity of 98% to 100% in the diagnosis of acute appendicitis.^{[8], [9]} According to earlier research, the most common illness causing pain in the RIF is appendicitis. Our research revealed that there are other possible causes of pain in the RIF besides appendicitis. Moreover, lower ureteric stones and ovarian cysts were frequently discovered conditions that hurt RIF patients. Nonetheless, 10% of patients with acute appendicitis experience a spontaneous remission of symptoms and indications 12-48 hours after the illness begins, followed by a recurrence^[10, 11]. The identification of a peristaltic, blind-ending, thick-walled, tubular structure with a diameter >6 mm under compression is one of the sonographic characteristics of acute appendicitis^[12]. Ovarian cysts are another source of discomfort in the RIF. Ruptures or hemorrhages are the source of pain^[13]. Hemorrhagic cysts manifest as complicated cystic lesions that have a thin wall,

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along with patches of coagulated blood that are hyperechogenic [13]. The study showed that different sonographic characteristics correlated with age and gender with different diseases in the RIF.

Without concentrating on other factors that may also cause pain in the RIF, the majority of earlier investigations showed that appendicitis was the most frequent finding that caused RIF pain. Thus, the goal of the study is to use US to identify a range of abnormalities that result in pain in the RIF. Given the extensive number of surgical and medical issues involving the RIF, this study is highly beneficial for surgeons and clinicians in the differential diagnostic process.

Materials and Methods

This study was cross-sectional and observational. Participants in the trial included 75 patients who came to the ED complaining of RIF pain. They were examined by the US using convex, linear, and transvaginal probes. Surgeons and physicians performed clinical examinations. Of the patients, 32 were men and 43 were women. The age range of sixteen to thirty-nine years. The investigation was carried out from July 2023 to December 2023 at the Tikrit Teaching Hospital. Patients having a history of cancer and pregnant women in their last stages were excluded. The patients gave their informed consent so they could take part in the research. The Institute Ethical Committee gave its approval to the study.

Sonography Procedure

US was performed using GE (model Logic E10) and GE (Model: Voluson E10) equipped with 6-MHz (convex array), 11-MHz transducers (linear probe) and end cavitory probe in some female patients. The transducer was positioned on the lower abdomen region in both the longitudinal and transverse planes while the patients were in the supine position. to check for stones in the lower right ureter and to assess the appendix and ovaries.

Statistical analysis

SPSS for Windows (Version 16.0. Chicago, SPSS Inc., USA) was used to analyze the data. The means and percentages of the data were displayed. The sonographic results in the RIF were correlated with age and gender using the Spearman test. Statistics were deemed significant if $p < 0.05$.

Results

This study assessed 75 individuals who came to the ED complaining of RIF pain. The patients range in age from sixteen to thirty-nine. The mean of participants was. Of them, 32 were men and 43 were women [Figure 1]. [Table 1] displays the sonographic results and participant age distribution. It was noted that ovarian cysts were more common in the age categories of 20-29 and 30-39 years, while appendicitis was more common in the ≤ 20 age group. US equipment equipped with 6 MHz and 11 MHz transducers were used to examine the patients. [Table 2] displays the kind and frequency of transducers. The RIF's sonographic results are shown in [Table 3]. It was observed that 18% of the patients with RIF discomfort did not display any sonographic signs and had negative results. Appendicitis was found more frequently than ovarian cysts and lower ureteric stones: 24% for appendicitis, 20% for

ovarian cysts, and 16% for lower right ureteric stones. Eight percent of cases were PID. Sonograms from the study's cases are shown in [Figure 2] and [Figure 3], which show the sonographic characteristics of appendicitis and lower ureteric stone. A transabdominal ultrasonography [Figure 4] shows a hemorrhagic cyst in a 19-year-old girl who is experiencing pain in her right iliac fossa.

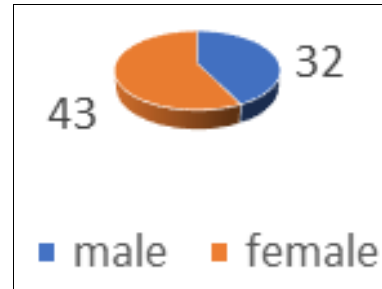


Fig 1: Frequency distribution of gender

Table 1: age distribution of the patients and the results of the right iliac fossa ultrasonography

Age (years)	Appendicitis	Lower ureteric stone	Ovarian cyst
≤ 20	11	1.0	2.0
20-29	5.0	4.0	8.0
30-39	2.0	7.0	5.0
Total	18	12	15

Table 2: ultrasound probes used to examine the patients

Type of probe used	Frequency
Convex	6
Linear	11
Endocavitory	9

Table 3: Findings on ultrasound in individuals experiencing right iliac fossa pain

Ultrasound findings	Frequency
Normal	12(16%)
Appendicitis	18 (24%)
Appendicular rupture	3(4%)
Ovarian cyst	15(20%)
Lower ureteric stone	12(16%)
Pelvic inflammatory disease	6(8%)
Others	9(12%)
Total	75

Experiencing right iliac fossa pain

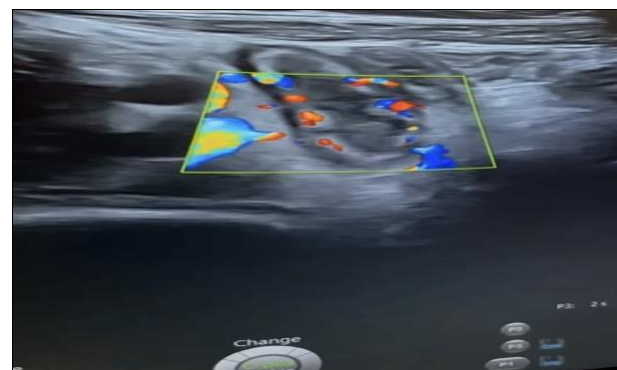


Fig 2: 16-year-old boy's sonography revealed a dilated appendix with an edematous wall and signs of inflammation in the appendix, along with acute discomfort and tenderness in the area.

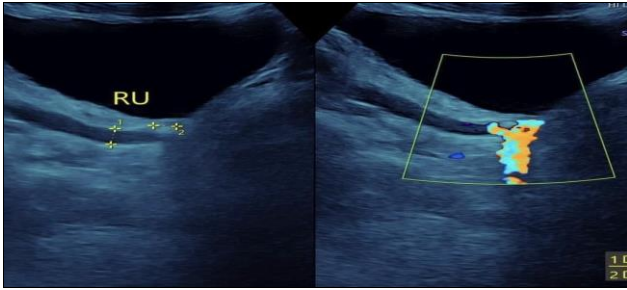


Fig 3: A 31-year-old man's right iliac fossa pain was diagnosed on sonography, which revealed a stone impinged in the right vesico-ureteric junction (VUJ).

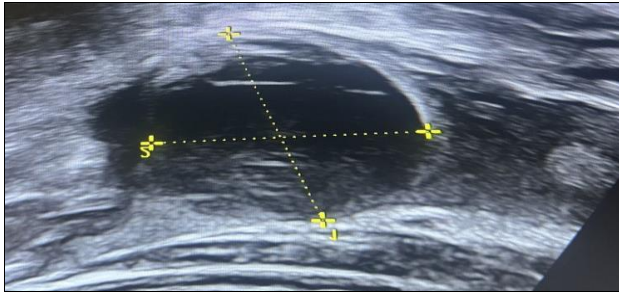


Fig 4: A 19-year-old female patient's transabdominal sonography revealed a right ovarian cyst with internal echoes, suggesting a hemorrhagic cyst. The patient also reported right iliac fossa pain.

Age and gender showed a statistically significant correlation with the sonographic results ($p \leq 0.05$ for each). This shows that gender and age were significant risk factors for diseases affecting the RIF.

Discussion

The meeting place for general surgeons, urologists, nephrologists, gastroenterologist, gynecologists, and internists is acute pain in the RIF [14]. Appendicitis is often diagnosed as the cause of RIF discomfort. We illustrated a range of diseases in the RIF in the ED that result in pain in this study.

The second reason for RIF pain, according to the current study, is ovarian cysts. While ovarian cysts are less common than appendicitis, the difference is only 4% (24% vs. 20%, respectively). However, the main cause of ED hospitalization for women is acute pelvic pain. It was found that ovarian cysts were the cause of 17% of cases of RIF fossa pain. According to Page *et al.* [15], hemorrhagic ovarian cyst rupture, adnexal torsion, and ectopic pregnancy are the three gynecological causes of acute discomfort. This result is in line with the findings of our study, which found that the most common source of pain in women was ovarian cysts. However, in 33% of women in the reproductive age group who are not pregnant, appendicitis is misdiagnosed. PID is the most common misdiagnose, followed by urinary tract infections and gastroenteritis [16]. US is crucial and reliable for differential diagnosis in these situations. The US distinguishes between appendicitis and ovarian cysts. As a result, the first line of inquiry for confirming the diagnosis in young women's pelvises.

Lower ureteric stones and PID were found to be the third and fourth etiologies of RIF pain, respectively, in the current investigation. According to Moodi, 16% of cases of lower ureteric stones occur [17]. These outcomes support our findings. All of these results confirmed that RIF pain was produced by a variety of etiologies and was not exclusively

related to appendicitis.

The current investigation found a statistically significant relationship between the patients' age and gender and the RIF's sonographic results. This suggests that age and gender have an impact on the prevalence of appendicitis, pelvic inflammatory disease, ovarian cysts, and right lower ureteric stones. Children's appendicitis was examined from a gender viewpoint by Salö *et al.* [18]. It has been found that there are gender disparities among children who suffer from appendicitis. This provided evidence that the incidence of appendicitis varies between genders. This outcome was consistent with our research supporting the role of gender as a significant predictor of RIF pain prevalence. However, age was still another important predictive factor linked to the causes of RIF pain. The age group of 20-29 years old had a common incidence of appendicitis, according to this study. According to Ceresoli *et al.*'s epidemiology study on acute appendicitis, the mean age was found to be 24.51 ± 16.17 years. This finding is in line with their findings [19].

In relation to the various reasons for RIF discomfort, it was shown that ovarian cysts were frequently seen in the 20-29 and 30-39 age groups. According to Jone, ovarian cysts were prevalent in the 38-year-old age group [20]. This outcome is consistent with our discovery that women in the 20-39 age range are the majority of those affected by ovarian cysts. The results of all of these studies provided evidence that gender and age have a major role in determining the prevalence of diseases that induce RIF discomfort.

Conclusion

Acute pain in the RIF can be a symptom of many gastrointestinal, urological, and gynecological disorders. Therefore, US of the pelvis and abdomen is required prior to starting any operation for significant pain at RIF. Age and gender are thought to be important variables in determining RIF pain.

Conflict of Interest

Not available

Financial Support

Not available

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