DOI: https://doi.org/10.54393/pbmj.v5i11.823

PAKISTAN BIOMEDICAL JOURNAL

https://www.pakistanbmj.com/journal/index.php/pbmj/index

Volume 5, Issue 11 (November 2022)

Original Article

The Role of Ultrasound in the Diagnosis of Pelvic Pain in Non-Pregnant Females

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ARTICLE INFO

Key Words:

Acute pelvic pain, non-pregnant females, PID, Ultrasound

How to Cite:

Fatima, N. ., Hina, G. E. ., Imran, A. ., & Khalid, Q. . (2022). The Role of Ultrasound in the Diagnosis of Pelvic Pain in Non-Pregnant Females: Role of Ultrasound in the Diagnosis of Pelvic Pain . Pakistan BioMedical Journal, 5(11). https://doi.org/10.54393/pbmj.v5i11.823

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Received Date: 9th August, 2022

Acceptance Date: 23rd December, 2022

Published Date: 31st December, 2022

ABSTRACT

Pelvic pain is the most common concern among women who visit the ER, and ultrasonography should be the first imaging method used to evaluate these patients. **Objectives:** To evaluate how well ultrasonography could diagnose different causes that can lead to pelvic pain in women. **Methods:** A cross-sectional study was held at Chatha Hospital, Al Amin Diagnostic Center, and Gondal Hospital. It used B mode ultrasonographic capability and in order to avoid artifacts or attenuation, an ultrasonic gel is applied to the transducer. Hospitals were legally authorized to take the information. Inclusion criteria were used to determine patient eligibility. **Results**: The commonest ultrasonography findings of pelvic pain were an ovarian cyst in 16 out of 97 which were 16.4%, bulky uterus with fibroid in 26 patients (26.8%), endometriosis in 4 patients (4.1%), ovarian enlargement in 3 patients (3.1%), endometriotic cyst in 6 patients (6.2%), RPCOs in 8 patients (8.2%), PCOs in 9 patients (9.3%), hydronephrosis in 4 patients (4.1%), fluid in cul de sac in 7 patients (7.2%), thickened endometrium in 3 patients (3.1%), pelvic inflammatory disease in 5 patients (5.2%), appendicitis in 4 patients (4.1%), and inguinal hernia in 2 patients (2.1%). **Conclusions**: Ultrasound scanning is a critical modality for detecting pelvic changes in female patients. The most common cause of pelvic in females is uterine fibroid and ovarian cyst. Moreover, pelvic pain occurs most frequently during the reproductive age and less frequently during menopause.

INTRODUCTION

In non-pregnant women, pelvic pain is a common manifestation that can be acute, chronic, or recurrent [1]. In contrast to chronic pelvic pain, which is often non-cyclical and lasts longer than six months, acute pelvic pain is typically transient and lasts less than three months [2]. Pelvic pain is a prevalent condition for women, accounting for 10%-40% of all gynecologic visits [3]. Patients are frequently referred for pelvic ultrasonography (US) for additional evaluation when a physical examination is insufficient to make a diagnosis [4, 5]. Throughout the menstrual period, the reproductive organs undergo a variety of functional changes that reflect the hormonal environment. Because postmenopausal ovaries no longer experience cyclical changes, a woman's menopausal state can help prevent an inaccurate assessment of physiological cysts [6]. Menopausal women are more likely to get gynecological cancer, and the risk increases with age and a family or personal history of bowel, endometrial, breast, or ovarian cancer [7]. Many symptoms and indicators of pelvic pain in women are insensitive and generic, making diagnosis difficult. In addition to physical examination, a comprehensive history concentrating on pain features, assessment of systems, and gynecologic, sexual, and social history can assist reduce the differential diagnosis. The most important aspect is the pelvic examination, which is required for any woman experiencing abdominal or pelvic pain. When assessing the adnexa, physicians should be aware of the limitations of a pelvic examination [8]. Early detection of pelvic pain is crucial to preventing the consequences of delayed diagnosis,

DOI: https://doi.org/10.54393/pbmj.v5i11.823

including ectopic pregnancy, ovarian torsion, and PID-related infertility, as well as appendiceal perforation [9]. Due to the close closeness of the appendix, uterus, right fallopian tube, and right ovary, right-sided pelvic pain is particularly difficult and confounding. Typically, imaging is needed to determine the cause [10]. The presence of nonspecific or altered clinical symptoms that are obscured by synchronous physiologic and anatomic alterations is the most critical part impacting this context [11, 12]. For most emergency department purposes, ultrasound provides a quick, safe, and easily available imaging modality that does not need the administration of intravenous contrast material [13]. In an emergency, radiologists employ ultrasonography as their first line of protection since it provides information that assists them in avoiding a delayed diagnosis [14]. In the last 40 years, ultrasonography has developed into a significant diagnostic tool. In the 1930s and 1940s, its potential to be a pioneer in medical diagnostic imaging was identified [15]. When appropriate, ultrasound views are utilized to show precise information. Many of the images have been enhanced to a larger degree than those utilized during an ultrasound scan to emphasize these results [16]. The uterus, ovaries, and other pelvic structures are frequently examined using both transabdominal and transvaginal methods [17]. The sonographer and all workers engaged in the examination should have a good grasp of the broad symptomatology associated with the various causes of pelvic pain. Taking the patient's history is the most crucial part of the examination at first. This will direct the process that will be used to make the diagnosis. Providing this information to a pelvic ultrasound allows it to look at various anatomical structures [18]. When necessary, ultrasound views are used to display precise data. To emphasize these findings, many of the images have been enhanced more than they would have been during an ultrasound scan [19]. However, its execution has some hazards, as is the case with nearly any medical procedure: Inaccurate diagnosis on the one hand, and potential adverse consequences on the other [20].

METHODS

A cross-sectional study was held at Chatha Hospital, Al Amin Diagnostic Center, and Gondal Hospital. The total converges of the study's span included 97 patients. The sample size was taken from the relevant previous research that was published [21]. Among them all patients were diagnosed with pelvic pain and an additional assessment of the cause was accomplished using ultrasonography. The most affected age was 21-30 years. An ultrasound machine of Toshiba Xario (7500kv) with two probes ultrasonographic imaging system was used. It used B mode ultrasonographic capability in order to avoid artifacts or attenuation, and an ultrasonic gel was applied to the transducer. The data was collected and entered using a structured questionnaire, which included questions about age, social status, and ultrasonographic findings. Inclusion criteria were used to determine patient eligibility. Inclusion criteria were any female patient visiting the hospital at the time, experienced pelvic pain. Exclusion criteria included pediatric patients and pregnant women. Prior to the examination, the patient was positioned in the spine position. From the anterior approach, using the bladder as an acoustic window scan were performed in the sagittal and transverse planes (transabdominal scan as well as transvaginal scan). To allow for sufficient penetration, the highest frequency was used with an empty bladder. Usually, this was in the 3.5MHz range. Hospitals were authorized legally to take the information. After being entered into a excel spreadsheet, the collected data were transcribed into an SPSS spreadsheet.

RESULTS

A cross-sectional study on 97 patients, with pelvic pain, was conducted. An ultrasound machine of Toshiba Xario (7500kv) with two probes ultrasonographic imaging system was used. It uses B mode ultrasonographic capability in order to avoid artifacts or attenuation. The data has been collected and entered using a structured questionnaire, which included questions about age, social status, and ultrasonographic findings. Inclusion criteria were used to determine patient eligibility. Any female patient visiting the hospital at the time mentioned experiencing pelvic pain was included. The data were analyzed and indicated that the age group 21-30 (52.6%) has the highest patient frequency and the age groups between 41-50 (5.2%) and 51-60 (5.2%) have the lowest patient frequency mentioned in Table 1.

Age (yr)	Frequency (%)
10-20	13 (13.4%)
21-30	51 (52.6%)
31-40	23 (23.7%)
41-50	5 (5.2%)
51-60	5 (5.2%)
Total	97 (100%)

Table 1: Frequency distribution of age groups with pelvic pain (n=97)

The Table 2 shows that more females were married (55.7%) than unmarried (44.3%)

Marital status	Frequency (%)
Married	54 (55.7%)
Unmarried	43 (44.3%)
Total	97 (100%)

Table 2: Frequency of marital status of females with pelvic pain

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The Table 3 represents the ultrasonography findings of pelvic pain patients who had ovarian cyst (16.5%), endometriosis (4.1%), bulky uterus with fibroid (26.8%), ovarian enlargement (3.1%), RPCOs (8.2%), PCOs (9.3%), hydronephrosis (4.1%), fluid in cul de sac (7.2%), thickened endometrium (3.1%), PID (5.2%), appendicitis (4.1%) and inguinal hernia(2.1%).

Valid	Frequency (%)
Ovarian cyst	16 (16.5%)
Endometriosis	4 (4.1%)
Bulky uterus with fibroid	26 (26.8%)
Ovarian enlargement	3 (3.1%)
Endometriotic cyst	6 (6.2%)
RPCOs	8 (8.2%)
PCOs	9 (9.3%)
Hydronephrosis	4 (4. 1%)
Fluid in cul-de-sac	7 (7.2%)
Thickened Endometrium	3 (3.1%)
Pelvic Inflammatory Disease	5 (5.2%)
Appendicitis	4 (4.1%)
Inguinal Hernia	2 (2.1%)
Total	97 (100%)

Table 3: Frequency of ultrasonographic findings of the females with pelvic pain(n=97)

DISCUSSION

This study evaluated the effectiveness of ultrasonography in 97 patients with pelvic pain at Chatha hospital, Al Amin diagnostic center, and Gondal hospital. Among them, all patients were diagnosed with pelvic pain, and an additional assessment of the cause was accomplished using ultrasonography. The minimum age being affected is between 10-20 years with the result of 13 patients (13.2%) and the maximum age between 50-60 years with the result of 5 patients (5.2%). The age group affected more commonly is 21-30 years with 51 patients (52.6%). Although all patients presented with pelvic pain, the majority of those surveyed in the study reported suprapubic pain rather than RIF and LIF which is in consistent with the previous study [22]. A standard ultrasound exam consists of a series of static cross-sectional images collected in a specified sequence, such as in transverse and sagittal cross-sections. The 95 percent diagnostic accuracy of this triage task strongly shows its utility in assisting clinicians in resolving the challenging problem of pelvic pain [22]. In the study, 21 patients (21.6%) come with vaginal bleeding and 76 patients (78.4%) do not have any sign of vaginal bleeding. Also, most of the patients do not have vaginal discharge 72 patients (74.2%) and 25 patients (25.8%) have vaginal discharge. Although many patients have normal uterus sizes 71 patients (73.2%) but 26 patients (26.8%) have enlarged uterus with the presence of uterine masses. In the initial assessment of pelvic pain, transvaginal ultrasound is the imaging modality of choice [23]. The majority of patients do not have any fluid cul-de-sac (pouch of Douglas). Fluid is present in the pouch of Douglas in 7 patients (7.21%) and 90 patients (92.7%) and do not have it. The distribution of ultrasonographic findings that causes pelvic pain is demonstrated in the table (3) follows as; ovarian cyst was 16 out of 97 which is 16.4%, bulky uterus with fibroid in 26 patients (26.8%), endometriosis in 4 patients (4.1%), ovarian enlargement in 3 patients (3.1%), endometriotic cyst in 6 patients (6.2%), RPCOs in 8 patients (8.2%), PCOs in 9 patients (9.3%), hydronephrosis in 4 patients (4.1%), fluid in cul de sac in 7 patients (7.2%), thickened endometrium in 3 patients (3.1%), pelvic inflammatory disease in 5 patients (5.2%), appendicitis in 4 patients (4.1%), and inguinal hernia in 2 patients (2.1%) which is consistent with the previously reported data [24]. For the identification and evaluation of complications in women with acute pelvic pain, ultrasound has emerged as a valuable primary imaging tool.

CONCLUSIONS

The most common cause of pelvic in females is uterine fibroid and ovarian cyst. The least triggering cause of pelvic pain is an inguinal hernia. Moreover, pelvic pain occurs most frequently during the reproductive age and less frequently during menopause. Ultrasound is an effective technique and has a low cost that makes it superior to any imaging modality for detecting the cause of acute pelvic pain. Furthermore, it does not use ionizing radiations like CT and no need for contrast material hence the US is safe for reproductive-age females.

Conflicts of Interest

The authors declare no conflict of interest

Source of Funding

The author(s) received no financial support for the research, authorship and/or publication of this article

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