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ACCURACY OF PELVIC ULTRASOUND IN DIAGNOSING ADNEXAL TORSION IN FEMALES OF REPRODUCTIVE AGE GROUP PRESENTING WITH LOWER ABDOMINAL PAIN

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Abstract:

Introduction: *Misdiagnosing ovarian torsion is now suggested as an important issue in clinical setting that is suggested to be related to the variety of its clinical manifestations.* ***Objectives:*** *The main objective of the study is to find the accuracy of pelvic ultrasound in diagnosing adnexal torsion in females of reproductive age group presenting with lower abdominal pain.* ***Material and methods:*** *This descriptive study was conducted in Jinnah Hospital, Lahore during March 2019 to November 2019. All women aged between 14 and 45 years with acute lower abdominal pain suggestive of ovarian or adnexal were identified. Among the selected subjects, only those with positive ultrasound findings suggestive of ovarian/adnexal torsion and underwent laparoscopic surgery were included in this study.* ***Results:*** *The data was collected from 100 patients. 43 (13.3%) were confirmed as cases of ovarian torsion by surgery and other surgical diagnoses were appendicitis (24.8%), hemorrhagic cyst (22.9%), ectopic pregnancy (21.1%), and others (18.0%). The highest and the lowest mean age was specified to women suffering from ovarian torsion (24.9 ± 8.0 years) and hemorrhagic cyst (26.9 ± 7.8 years). Twenty eight women (8.7%) were pregnant who suffered the most from ovarian torsion compared with non-pregnant women (35.7% versus 11.1%, $p < 0.001$).* ***Conclusion:*** *It is concluded that increment in the number of cases of adnexal torsion demands specific, quick, and accurate diagnostic measure. Ultrasound has been the most successful technique in this scenario.*

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INTRODUCTION:

Misdiagnosing ovarian torsion is now suggested as an important issue in clinical setting that is suggested to be related to the variety of its clinical manifestations. Clinically, this phenomenon can be manifested by severe pain in lower abdomen, occasionally with nausea and vomiting, however pain referring to the position of other organs such as kidneys and pelvic-related systems so clinical presentation of ovarian torsion is variable and often misleading. Also, physical examination is non-specific and peritoneal irritability may be present or absent [1].

Adnexal torsion accounts for almost 3% of surgical emergencies [2]. It involves twisting of the ovary and/or fallopian tube leading to either a necrotic ovary or an undamaged ovary with impaired vascularization. This incidence is most common in women aged between 14 and 45 years. To prevent the loss of the ovary or adnexa and severe conditions such as thrombophlebitis or peritonitis, delay in the diagnosis should be avoided [3]. The presence of an ovarian mass of at least 5 cm is the primary risk factor that can cause torsion [3, 4].

Diagnosis of an ovarian torsion is challenging due to lack of sensitivity and specificity of its clinical signs [5]. Mostly, patients with ovarian torsion show abdominal pain as the major clinical symptom [6]. To the present, the diagnosis of ovarian torsion has been based on clinical findings.

Reports from existing evidence suggest that sonography along with ovarian vasculature Doppler flow studies help in the correct diagnosis of only 66% of surgical cases. The ultrasonography based diagnostic technique is known to be operator-dependent and, thus, may involve human error. However, in suspected patients to ovarian torsion, the presence of normal-appearing ovaries does not rule out its diagnosis. For improvement of ultrasonography application for detection of ovarian torsion, Doppler flow study has been employed aimed to assist clinicians in reaching the more accurate diagnosis of ovarian torsion [7].

Objectives

The main objective of the study is to find the accuracy of pelvic ultrasound in diagnosing adnexal torsion in females of reproductive age group presenting with lower abdominal pain.

MATERIAL AND METHODS:

This descriptive study was conducted in Jinnah Hospital, Lahore during March 2019 to November 2019. All women aged between 14 and 45 years with acute lower abdominal pain suggestive of ovarian or adnexal were identified. Among the selected subjects, only those with positive ultrasound findings suggestive of ovarian/adnexal torsion and underwent laparoscopic surgery were included in this study. Relevant information including patient demographics, past medical and surgical history, and operative and pathology notes were collected from the electronic medical records. All retrieved data were then tabulated into an excel sheet. Patients underwent a transabdominal sonography. The findings of sonography were compared with laparatomy findings. The data were collected by chart review for all patients. All baseline variables including demographics and clinical manifestations were recorded. The data were analyzed using SPSS version 19.0. All the statistical tests were considered significant at $P \leq 0.05$.

RESULTS:

The data was collected from 100 patients. 43 (13.3%) were confirmed as cases of ovarian torsion by surgery and other surgical diagnoses were appendicitis (24.8%), hemorrhagic cyst (22.9%), ectopic pregnancy (21.1%), and others (18.0%). The highest and the lowest mean age was specified to women suffering from ovarian torsion (24.9 ± 8.0 years) and hemorrhagic cyst (26.9 ± 7.8 years). Twenty-eight women (8.7%) were pregnant who suffered the most from ovarian torsion compared with non-pregnant women (35.7% versus 11.1%, $p < 0.001$). The ultrasound correctly diagnosed 72.1% of ovarian torsion cases and missed 27.9% of these cases (false negatives). In patients with ovarian torsion, the most frequent sonographic markers observed were relative enlargement of the affected ovary, ovarian edema, and the presence of an ovarian mass/cyst. Ovarian edema and ovarian enlargement were both found to be statistically significant markers.

Table 01: Presence of the various sonographic markers in the torsion and no torsion groups

Variables	Negative 72	Positive 29	P-Value
Ovarian edema	20 (0.0)	4 (40.0)	0.003
Ovarian enlargement	10 (37.0)	8 (80.0)	0.03
Ovarian cyst or mass	11 (40.7)	6 (60.0)	0.3
Abnormal ovarian location	02 (2.0)	3 (30.0)	0.002
Abnormal ovarian blood flow	10 (10.0)	2 (20.0)	NA
Free fluid in pouch of Douglas	6 (11.2)	2 (20.0)	1
Fluid around the ovary	10 (10.0)	2 (20.0)	NA
Distended fallopian tube	02 (2.0)	1 (10.0)	NA
Sites of bleeding within the affected ovary	01 (1.0)	1 (10.0)	NA

DISCUSSION:

According to our findings, sonographic diagnosis of ovarian torsion had overall accuracy of 96.0% with the sensitivity of 72.1% and the specificity of 99.6%, respectively. Comparing our results with the previous reported findings confirm higher obtained diagnostic value of sonography compared with some studies and lower value compared with others in our survey. In a similar study by Mashiach and colleagues, sonography had diagnostic accuracy of 74.6% for ovarian torsion [8].

At present, there is no reliable method to confirm the diagnosis of adnexal torsion preoperatively. To prevent the loss of the ovarian function and its potential association with fertility problems, an early diagnosis of an adnexal torsion is needed [8]. Moreover, delay in diagnosis and treatment or mistake in diagnosis may lead to potentially fatal thrombophlebitis or peritonitis. Abnormal flow detected by Doppler sonography can be highly predictive of adnexal torsion and is therefore useful in the diagnosis of ovarian torsion. In fact, several studies have previously concluded that completely normal venous waveforms are very unlikely in cases of ovarian torsion [9]. However, when normal flow is detected, it does not necessarily exclude an ovarian torsion; in fact, torsion can be missed in 60% of cases [10]. In addition, Murat et al. also reported velocity loss in Doppler sonography in 46.4% of the patients.

Unlike the literature, in our case series, no abnormal arterial or venous Doppler flow was noted in any of the 10 ovarian torsion cases, not enabling us to calculate the positive predictive value (PPV) in this case [11]. Therefore, relying on normal Doppler sonography could have resulted in missing all cases of torsion. Normal Doppler studies should not delay surgical intervention in the presence of a high clinical index of suspicion [12].

CONCLUSION:

It is concluded that increment in the number of cases of adnexal torsion demands specific, quick, and accurate diagnostic measure. Ultrasound has been the most successful technique in this scenario. Yet, considering the consequences and probable loss of the patient due to delayed diagnosis or misdiagnosis, better detection accuracy is required.

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