

Twists and Turns: Navigating Clinicoradiological Presentations, Decision Making in Management and Histopathological Revelations of Adnexal Torsion

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Abstract

Adnexal torsion is a rare condition that can be potentially fatal if untreated. It has a varied clinical presentation and can affect any age group. Clinicians can diagnose and treat adnexal torsion more accurately if they are aware of the clinical and pathological characteristics of the patients. To analyze the clinical and pathological profile of adnexal torsion cases in Saveetha Medical College. The study was a retrospective analysis of hospital records which included all cases of adnexal torsion that underwent treatment between January 2023 to January 2024 in Saveetha Medical College. The majority (61.37%) of participants were in the reproductive age group (18-40 years). Abdominal pain was the most common symptom seen in 84.44% of patients. Majority of the women belonged to Para 2 (54.44%) and Para 1 (24.24%). Half the subjects underwent Vaginal delivery while the remaining underwent Caesarean section. A right-sided predominance was observed with most of them having one and two turns (32%). On histopathological examination, a simple serous cyst (25%) was the most predominant finding. Even though adnexal torsion is a rare clinical illness, it typically manifests as an emergency. A high degree of suspicion is necessary for the diagnosis because there are many possible clinical presentations. However, the diagnosis can only be confirmed on the operating table. The patient should be operated on as soon as possible to prevent complications and aid in conserving the ovary.

Keywords: Adnexal Torsion, Caesarean Section, Hydrosalpinx, Salpingo-Oophorectomy.

Introduction

Adnexal torsion is an uncommon condition that may be fatal for patients if untreated. It affects people of all ages, from pre-teens to women who are far into their menopause [1]. Most adnexal torsion are unilateral; bilateral torsion is quite uncommon. Torsion is more likely in cases of adnexal pathology such as ovarian cysts or tubal enlargements such

hydrosalpinx [2]. Whether a torsion is partial, or total will determine the clinical appearance. Acute signs of complete torsion include excruciating stomach pain, nausea, and vomiting [3]. The symptoms typically appear after a woman has engaged in strenuous physical activity, such as lifting, straining, severe physical labor, or sexual activity. Women who exhibit these kinds of symptoms

need to be treated with a high degree of suspicion.

Adnexal torsion diagnosis can be delayed due to nonspecific symptoms. Diagnostic imaging is aided by Doppler flow ultrasonography, CT scanning, and MRI. The gold standard for diagnosing torsion is pelvic ultrasonography with color doppler, which may detect adnexal enlargement on ultrasound and provide the necessary clinical information. Additional differential diagnoses that need to be taken into account are ruptured corpus luteum, appendicitis, gastroenteritis, adnexal pregnancy, and pelvic inflammatory illness [4, 5].

Most centers conduct laparotomies on women who arrive with acute abdominal and adnexal torsion symptoms. An alternate method that can be performed is laparoscopy; however, it necessitates surgical proficiency in operative laparoscopy, as well as the availability of equipment and skilled support personnel. Adnexal torsion is best diagnosed and treated with laparoscopy; wherever feasible, conservative surgery such as detorsion with cystectomy, cyst aspiration, or oophorectomy is preferred to salpingectomy or oophorectomy. Clinicians can diagnose and treat adnexal torsion patients more effectively if they are aware of the clinical and pathological characteristics of these individuals [4, 5]. To analyze the clinical and pathological profile of adnexal torsion cases in Saveetha Medical College.

Methodology

The present study was designed to describe the demographic characteristics, clinical features, treatment, and prognostic factors of adnexal torsion. This was a retrospective study conducted at Saveetha Medical College over a period of 1 year after getting approval from the institutional ethical committee.

A retrospective study of the inpatient registry from January 2023 to January 2024 identified women with adnexal mass with

suspected adnexal torsion. All patients with complaints of abdominal pain (lower abdominal pain {pelvic}, diffuse pain and epigastric pain), and adnexal mass in USG with or without hemodynamic instability were taken into the study. A total of 44 patients had reported to the gynaecology department which satisfied the above-mentioned criteria. Clinical data was extracted from the patient's medical records which encompassed demographic information, obstetric and menstrual history, clinical manifestations, and laboratory test results. Additionally, details from various imaging modalities including ultrasonography (USG), CT scan, and MRI imaging, as well as operative observations and histopathological findings were also documented.

As per the institute's protocol, all subjects gave their informed consent for laparoscopy or open surgical procedures depending on the surgical condition at the time of operation. The subjects of the study were kept anonymous.

The twisting of an ovary around its ligamentous support is known as ovarian torsion, and it can lead to reduced vascularity. The word "adnexal torsion" refers to either the fallopian tube, the ovary, or both [6]. The principal researcher retrieved and examined all instances with suspected and established adnexal torsion, and the data utilized for analysis came directly from case reports.

Statistical Analysis

The data collected was entered into a Microsoft Excel spreadsheet. Detailed descriptive analysis of socio-demographic, clinical, and pathological parameters of the adnexal torsion cases was done using Microsoft Excel Workbook. The data was represented as percentages in the form of figures and tables.

Results

Majority of the subjects belonged to the age group of 31-40 years (38.64%) followed by the 18-30-year age group (22.73%) with a mean age of 34.1 years (Figure 1). Among the women

in reproductive age group and post-menopausal women, 54.55% were Para 2 followed by 24.24% being Para 1 (Figure 2). Around 84% of the participants were married. Among the patients, 50% underwent vaginal delivery while the rest underwent LSCS. 71.43% underwent NVD twice followed by 21.43% who underwent once (Figure 3). 62.50% underwent LSCS twice while 31.25% underwent LSCS once (Figure 4).

65.79% of participants had a history of sterilization. Abdominal pain was the most common complaint seen in 84.44% of subjects. On the Per Abdomen and Per vaginal

examination, 28 subjects were observed to have a pelvic mass and 16 had pelvic tenderness. Of the 44 women who underwent USG with color doppler, 56.8% were detected with torsion and 89.2% of the USG detected torsion cases were found to have torsion intraoperatively. Of the 5 women who underwent CT, 3 were detected with torsion and of the 2 women who underwent MRI, one was detected with torsion. (Table 1). All CT and MRI detected torsion cases were intraoperatively found to have torsion. On the whole, surgically proven adnexal torsion was seen in 63.64% cases (28 subjects) of the study population (Figure 5).

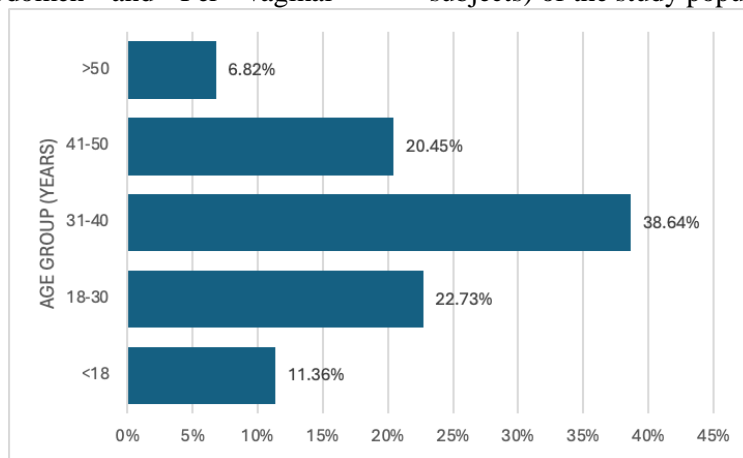


Figure 1. Distribution of Subjects Based on Age

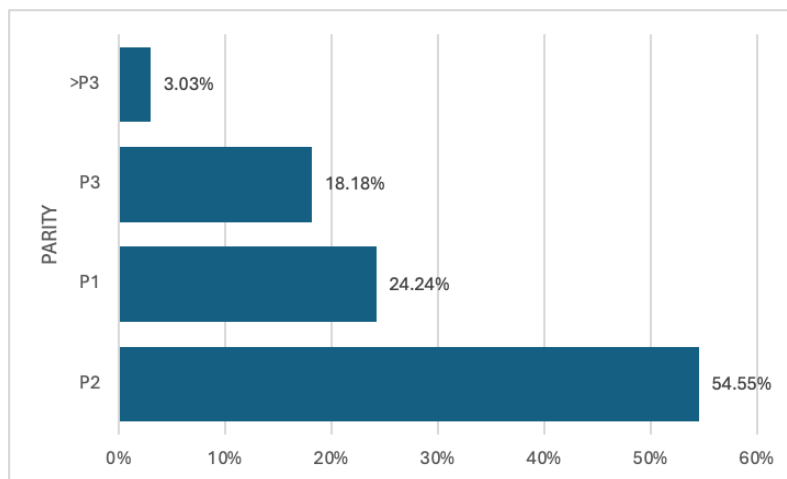


Figure 2. Distribution of Subjects Based on Parity

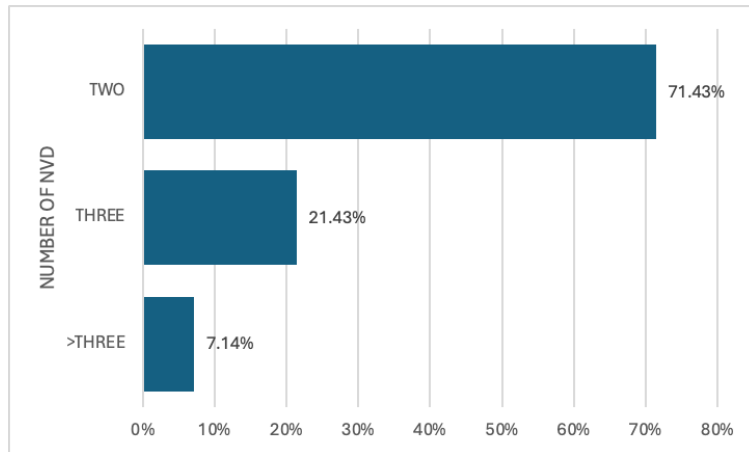


Figure 3. Distribution of Subjects (having Underwent NVD) on the Number of NVD

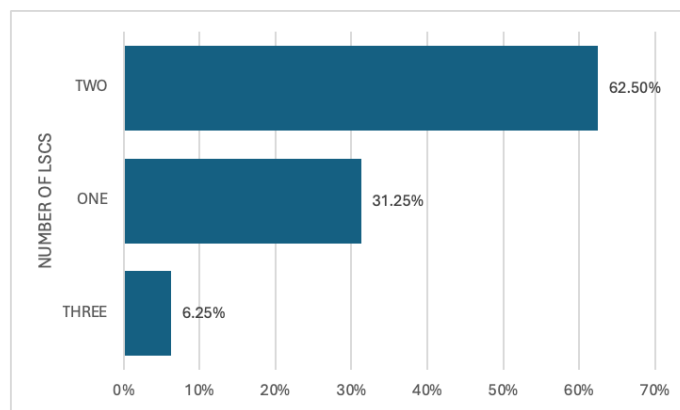


Figure 4. Distribution of Subjects (having Underwent LSCS) on the Number of LSCS

Table 1. Distribution of Subjects based on Detection of Torsion on Imaging

Imaging	Number of women with imaging	Number of women with detected torsion
USG WITH COLOR DOPPLER	44 (100%)	25(56.8%)
CT	5 (11.36%)	3(6.81%)
MRI	2(4.54%)	1(2.27%)

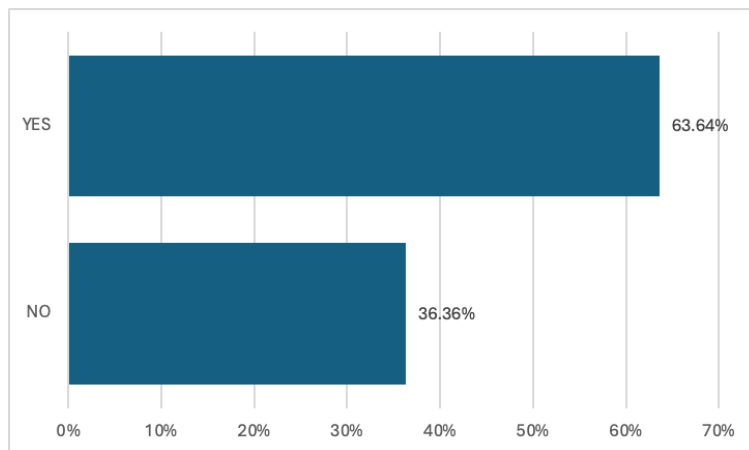


Figure 5. Distribution of Subjects based on Adnexal TORSION

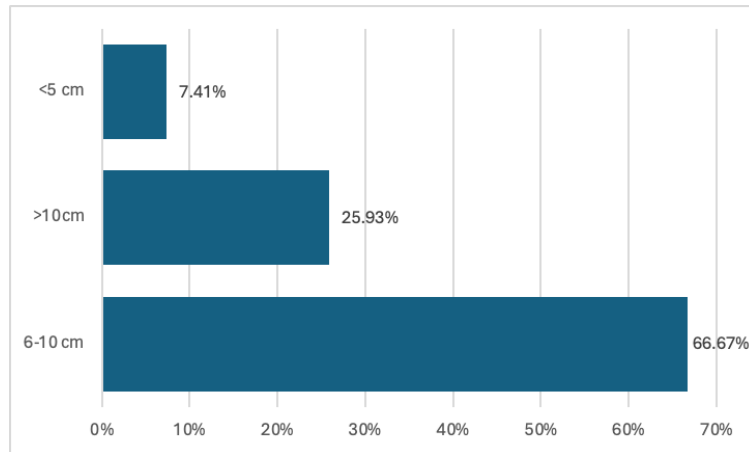


Figure 6. Distribution of Subjects based on Dimension of Mass Associated with Torsion

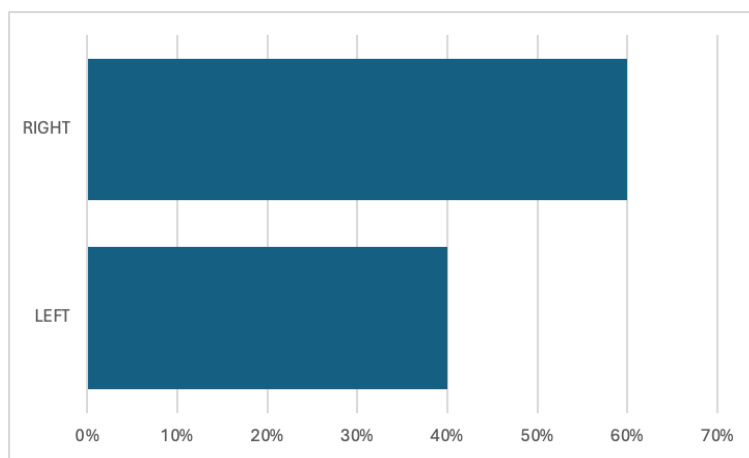


Figure 7. Distribution of Subjects Based on Side of Torsion

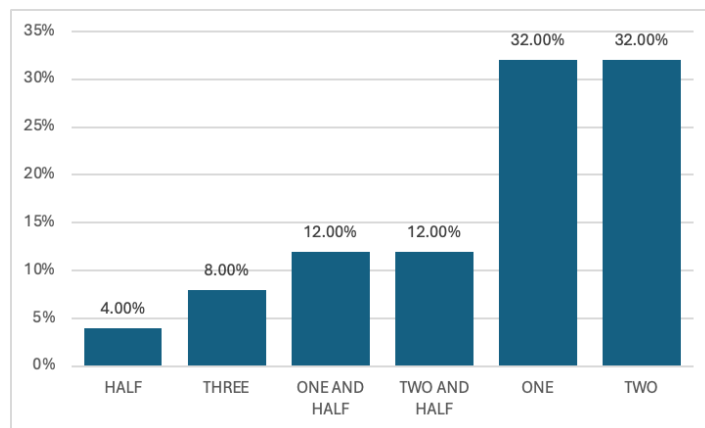


Figure 8. Distribution of Subjects Based on Number of Turns

Table 2. Distribution of Subjects Based on Detorsion Procedures

DETORSION +	COUNT
Salpingo oophorectomy	13
Ovarian cystectomy	5
Ovarian cystectomy and salpingectomy	3
Adnexal cystectomy	1

Ovarian cystectomy with oophorectomy	1
Oophorectomy	1
Salpingo-oophorectomy + pelvic lymph node sampling/peritoneal and omental biopsy	1
Ovarian cystectomy + fimbrial cystectomy	1
Ovarian cystectomy and adhesiolysis	1
Paraovarian cystectomy	1
Grand Total	28

Table 3. Distribution of Subjects Based on Histopathology of Adnexal Torsion Related Lesions

Histopathologic nature	Percentage
Simple Serous Cyst	25%
Serous cystadenoma	18.18%
Mucinous cystadenoma	13.6%
Hemorrhagic corpus luteal cyst	11.36%
Endometriotic cyst	4.54%
Surface inclusion cyst	4.54%
Teratoma	4.54%
Dysgerminoma	2.27%
Tubo ovarian abscess	2.27%
Seromucinous cystadenofibroma	4.54%
Ovary with edema and hemorrhagic infarcts	6.81%

Overall, 57.14% underwent laparoscopic surgery while the rest underwent laparotomy. Ovarian cystectomy was the most common laparoscopic procedure while salpingo-oophorectomy was the most common laparotomy procedure that was performed. Congestion of adnexal structures and hemorrhage were seen in 28.26% and 13.04% respectively.

The majority had a 6-10 cm mass associated with torsion (66.67%) followed by 25.93% who had a mass of >10cm. (Figure 6). Right sided torsion was seen in 60% cases while left-sided torsion was seen in 40% of cases. (Figure 7). One and two turns were seen in 32% of subjects, each followed by 12% showing one and a half and two and half each. (Figure 8) Salpingo oophorectomy was the most common detorsion procedure performed as seen in 13

cases followed by ovarian cystectomy in 5 cases. (Table 2). Simple Serous Cyst was the most common Histopathological finding (25%) overall, as well as the most common in surgically proven torsion cases followed by serous cystadenoma as seen in 18.18% of cases. (Table 3). Hydrosalpinx was seen in 2 torsion cases where one was isolated torsion of the fallopian tube and the other was tubo ovarian torsion. Torsion was also seen with two cases of teratoma and one case of dysgerminoma.

Discussion

Adnexal torsion comes in fifth among surgical emergencies in gynaecology that are observed in practice. Its prevalence, which is typically overestimated, is 2.7% –3.0% [4]. Though it can affect any age group; it is more common amongst those belonging to the

reproductive age group. This could be corroborated with the findings in our study which indicate the majority of the subjects belonged to the age group of 31-40 years (38.64%) followed by the 21-30-year age group (22.73%) with a mean age of 34.1 years. Verma et al., and Gupta et al., reported a slightly lower median age of 24 and 26 years respectively [5, 7].

The majority of our patients were parous and 4.55% had primary infertility. Of these, 24.24% were para 1 and 54.55% were para 2 which was similar to the results obtained in a study by Vijayalakshmi et al. This is because the majority of Indian women marry at a younger age and accept family planning with reluctance. Around 84% of the participants were married. Among the women, 50% underwent Vaginal delivery while the rest underwent LSCS. 71.43% underwent Vaginal delivery twice followed by 21.43% who underwent it once. 62.50% underwent LSCS twice while 31.25% underwent LSCS once. In a study by Vijayalakshmi et al, 72.2% underwent Vaginal delivery, 11.1% underwent LSCS once and 16.7% underwent LSCS twice [4].

Women who suffer from adnexal torsion typically have nonspecific symptoms, which causes a delay in diagnosis. Radiological imaging in conjunction with a high degree of clinical suspicion of adnexal torsion facilitates prompt diagnosis and treatment. Abdominal pain was the most common complaint seen in 84.44% of subjects. In their 15-year review, Houry and Abbott found that mild discomfort on abdominal examination (35%) and nausea and vomiting (70%), as well as stabbing pain (90%), were prevalent symptoms in 87 surgically confirmed cases of ovarian torsion [8]. Balci et al., reported a similar set of symptoms, with pelvic pain and nausea/vomiting being the most common whereas Verma et al., reported abdominal pain in all of their patients [5, 9]. Adnexal torsion can be diagnosed with an ultrasound examination with a sensitivity of 40-75% [10].

In our study, all patients had an ultrasound examination. USG Colour Doppler diagnosed 56.8% of the torsion cases. This was in concordance with a study where the color doppler can show whether blood is flowing. Venous flow is eliminated first during ovarian torsion, and then arterial flow [5].

Overall 57.14% underwent laparoscopic surgery while the rest underwent Laparotomy. Ovarian cystectomy was the most common laparoscopic procedure while salpingo-oophorectomy was the most common laparotomy procedure that was performed. Following histology, 36.96% of cases had an ovarian cyst reported. Ovarian cysts were shown to be significantly present in the study conducted by Grunau et al. on 55 cases of confirmed ovarian torsion. White and Stella observed similar findings with 51.9% of ovarian cysts [11, 12].

According to studies by Oltmann et al. and Budhram et al., ovarian masses measuring five centimetres or more in size are more likely to torsion [13, 14]. 66.67% of the cases in the present study had an adnexal mass that measured between 6-10 cm and had experienced torsion. The results point to a greater adnexal mass (especially between 6 to 10 cm) as a potential risk factor for torsion of the adnexa.

Right-side torsion was predominant in the study. A similar right-side predominance was also demonstrated in a study from Pondicherry [7]. This scenario is most likely a result of the left side having a sigmoid and the right ovary ligament being longer [15]. Our study has shown that the majority of the patients had one or two turns (32% each) at the pedicle at the time of surgery. Most of the available literature shows 1-2 turns in the adnexa. The likelihood of saving the adnexa decreases with the number of turns it experiences [4, 16].

Salpingo oophorectomy was the most common procedure performed in the current study. This was similar to that in Verma et al. Simple serous Cyst was the most common

Histopathological finding (25%) as well as the most common HPE finding in surgically proven torsion cases followed by serous cystadenoma seen in 18.18% of cases [5]. The majority of the cases in a study by Vijayalakshmi et al. were diagnosed as benign mucinous cystadenoma (33.3%) [4].

There were certain restrictions on the study. The study's sample size is limited, and it could have been increased to provide greater external validity. Since this was a retrospective study, bias resulting from missing data could have entered the analysis. It's also possible that patients who did not need surgery and had the less common presentation of ovarian torsion were overlooked.

Conclusion

Adnexal torsion is difficult to diagnose since the symptoms are nonspecific, necessitating

References

- [1]. Warner, M.A., Fleischer, A.C., Edell, S.L., Thieme, G.A., Bundy, A.L., Kurtz, A.B., et al., 1985. Uterine adnexal torsion: sonographic findings. *Radiology*, 154, 773–775.
- [2]. Provost, R.W., 1972. Torsion of the Normal Fallopian Tube. *Obstetrics & Gynecology*, 39, 80.
- [3]. Bider, D., Mashiach, S., Dulitzky, M., Kokia, E., Lipitz, S., Ben-Rafael, Z., 1991. Clinical, surgical and pathologic findings of adnexal torsion in pregnant and nonpregnant women. *Surg Gynecol Obstet*, 173, 363–366.
- [4]. Vijayalakshmi, K., Reddy, G.M.M., Subbiah, V.N., Sathiya. S., Arjun, B., 2014. Clinico-pathological profile of adnexal torsion cases: a retrospective analysis from a tertiary care teaching hospital. *J Clin Diagn Res*, 8, OC04-07.
- [5]. Verma, M., Bhuria, V., Chauhan, M., Nanda, S., Dahiya, P., Singhal, S.R., 2021. Adnexal torsion: a retrospective analysis from a tertiary care teaching hospital in northern india. *Cureus*, 13, e17792.

strong clinical judgment. The diagnosis of adnexal torsion is based mostly on strong clinical suspicion. Anytime a torsion is suspected, an ultrasound with Doppler should be performed since it aids in the diagnosis of an adnexal mass with torsion. Early detection of this condition can prevent the ovary from being removed, especially in young women.

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Conflict of Interest

The authors hereby declare that there is no conflict of interest in this study.

- [6]. Chang, H.C., Bhatt. S., Dogra. V.S., 2008. Pearls and pitfalls in diagnosis of ovarian torsion. *Radio Graphics*, 28, 1355–1368.
- [7]. Gupta, A., Gadipudi, A., Nayak, D., 2020. A five-year review of ovarian torsion cases: lessons learnt. *J Obstet Gynaecol India*, 70, 220–224.
- [8]. Houry, D., Abbott, J.T., 2001. Ovarian torsion: a fifteen-year review. *Ann Emerg Med*, 38, 156–159.
- [9]. Balci, O., Icen, M.S., Mahmoud, A.S., Capar, M., Colakoglu, M.C., 2011. Management and outcomes of adnexal torsion: a 5-year experience. *Arch Gynecol Obstet*, 284, 643–646.
- [10]. Mashiach, R., Melamed, N., Gilad, N., Ben-Shitrit, G., Meizner. I., 2011. Sonographic diagnosis of ovarian torsion: accuracy and predictive factors. *J Ultrasound Med*, 30, 1205–1210.
- [11]. Grunau, G.L, Harris, A., Buckley, J., Todd, N.J., 2018. Diagnosis of ovarian torsion: is it time to forget about doppler? *J Obstet Gynaecol Can*, 40, 871–875.

- [12]. White, M., Stella, J., 2005. Ovarian torsion: 10-year perspective. *Emergency Medicine Australasia*, 17, 231–237.
- [13]. Oltmann, S.C., Fischer, A., Barber, R., Huang, R., Hicks, B., Garcia, N., 2009. Cannot exclude torsion-a 15-year review. *Journal of Pediatric Surgery*, 44, 1212–1217.
- [14]. Budhram, G., Elia, T., Dan, J., Schroeder, M., Safain, G., Schlech, W., et al., 2019. A Case-Control Study of Sonographic Maximum Ovarian Diameter as a Predictor of Ovarian Torsion in Emergency Department Females with Pelvic Pain. *Acad Emerg Med*, 26, 152–159.
- [15]. Huchon, C., Fauconnier, A., 2010. Adnexal torsion: a literature review. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, 150, 8–12.
- [16]. Descargues, G., Tinlot-Mauger, F., Gravier, A., Lemoine, J.P., Marpeau, L., 2001. Adnexal torsion: a report on forty-five cases. *Eur J Obstet Gynecol Reprod Biol*, 98, 91–96.
- [17]. Aishwarya, R., Ethirajan, S., 2022. Gestational age at booking for antenatal care in a tertiary healthcare facility: a glance. *International Journal of Infertility & Fetal Medicine*, 13(3), 91-95.
- [18]. Omani-Samani, R., Hollins Martin, C. J., Martin, C. R., Maroufizadeh, S., Ghaheri, A., Navid, B., 2021. The birth satisfaction scale-revised Indicator (BSS-RI): a validation study in Iranian mothers. *The Journal of Maternal-Fetal & Neonatal Medicine*, 34(11), 1827-1831.
- [19]. Sandeep, S., Shanthi, E., 2020. Study on impact of maternal age on pregnancy outcome at a tertiary care hospital. *International Journal of Research in Pharmaceutical Sciences*, 11(2), 235-238.
- [20]. Kirubamani, N. H., 2014. Does Tubal Sterilization offer a Permanent Solution? *Indian Journal of Science and Technology*, 7(4), 418.