Journal of Pharmaceutical Research International

33(54A): 70-76, 2021; Article no.JPRI.78054
ISSN: 2456-9119
(Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759)

Ovarian Torsion Presentation, Treatment and Iatrogenic Surgical Management

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i54A33720
Editor(s):
(1) Dr. Dharmesh Chandra Sharma, G. R. Medical College & J. A. Hospital, India.
Reviewers:
(1) Laura Giambanco, Hospital S. Antonio, Italy.
(2) Maryam Shamsi, Arak Payam Noor University, Iran.
Complete Peer review History, details of the editor(s), Reviewers and additional Reviewers are available here: https://www.sdiarticle5.com/review-history/78054

Review Article

Received 04 October 2021
Accepted 08 December 2021
Published 08 December 2021

ABSTRACT

Ovarian torsion is among the gynecological life-threatening conditions that may require urgent surgical intervention among the appearance of clinical manifestations. The most common clinical manifestations include severe abdominal pain, nausea extending to vomiting. The ovarian torsion is not limited to children only. However, it can also occur in adult females, either pregnant or non-pregnant. The etiology of the disease tends to be related to the weakness of the uterine ligaments or malpositioning of it due to known and unknown causes. Despite that, the surgical intervention is

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needed to release the torsion. Sometimes, it can lead to adverse events or side effects such as decreased blood flow to the surrounding structures. Which by role may lead to unpleasant complications and clinical manifestations of hemorrhage and shock. In this article, we reviewed the topic of ovarian torsion from different aspects, including the definition, causes, clinical evaluation, and clinical management and its common complications.

Keywords: Ovarian torsion; gynecology; obstetrics; uterus; ovary.

1. INTRODUCTION

Ovarian torsion bills for about 3% of all acute gynecological emergencies. It remains a clinically challenging analysis as the signs are usually non-unique. A group of components carries out the ovary within the pelvis. The infundibulopelvic ligament, also known as the suspensory ligament of the ovary, links the ovary to the pelvic outer edge and is one of the ligaments that keep it sustained. This ligament also includes the prominent ovarian veins. The utero-ovarian ligament connects the ovary towards the uterus [1]. The ovary receives blood from both the ovarian and uterine vessels. The spinning of those ligaments can cause venous occlusion, edema, artery stiffness, and, as a result, poor blood flow to the ovary. This can result in many clinical manifestations, including acute pain, while blood flow is impaired. That is a definite interventional incident that, if not treated immediately, can result in necrosis, ovary loss, and reproductive problems [2].

The pre-operative analysis price procedures only forty% the use of pre-operative ultrasound and computerized tomography scans [1]. Ovarian torsion may be treated by way of ovarian distortion or oophorectomy. Every effort ought to be made to hold the ovary, as oophorectomy affects destiny fertility and ovarian reserve inside a long time [2]. When treated with oophorectomy, a recurrence of torsion on the contralateral side in a younger female should lead to castration. Ovarian torsion can arise at any age, from intra-uterine life to post-menopausal. It is most common in ladies of reproductive age, who tend to be nulliparous or pregnant [3]. Dependable records on the occurrence of adnexal torsion inside the well-known populace are missing. One of the few pieces of research that quote the prevalence inside the non-pregnant women is that with Hibbart et al., who said it to be 2.7% amongst all gynecological emergencies [4]. However, the true prevalence of this condition in the historical past population remains unknown. The prevalence in a large cohort of pregnant ladies in India became suggested as minimal [5]. In the UK, a study of women imparting to the early being pregnant unit, within the first trimester, determined a torsion incidence to be 3% in women in whom an ovarian cyst turned into recognized at regular scanning [6]. They examined 3000 women; therefore, the chance of torsion in a patient who provides in the early pregnancy unit is meager. The average age of a woman with ovarian torsion is in her late 20s, with the massive majority of instances occurring in women under 40 years of age [7]. This observation affords a review of all to be had proof aiming to decide the medical risk elements predictive of ovarian torsion. This is performed via evaluating the frequency of the proposed scientific features to the heritage populace of girls. This aims to provide an extensive and short review of the ovarian torsions regarding the presentation, treatment, and surgical complications.

2. EPIDEMIOLOGY, ETIOLOGY, AND PATHOLOGY

2.1 Epidemiological Characteristics

Torsion can occur in females of all age ranges, although it is more common in women of reproductive age. In a multiyear review of clinical emergencies at a girls' hospital, ovarian torsion was the sixth most prevalent, adjusted to account for 2.7%. Only 20% of individuals are premenstrual, and 50% of these might have had a normal ovary. Torsion was most commonly associated with a benign ovarian tumor in sexually active women [8]. Being pregnant is also a separate risk factor for torsion. Eight to fifteen percent of individuals diagnosed with torsion were pregnant in a population-based study [9].

2.2 Etiological Philosophy

An ovarian lump five centimeters or more is the major risk factor for ovarian torsion. The bulk makes it more likely that the ovary will swivel on

the axis of the two ligaments, keeping it suspended. This twisting obstructs venous permeability and, ultimately, arterial input [10]. In a study of torsions substantiated by surgical intervention, 46% were connected to malignancy, and 48% had attributed to cysts. Eighty-nine percent of these concentrations were benign, and 80 percent of participants were under 50. As a result, females of sexual maturity are more vulnerable to torsion [10]. Torsion can, however, develop in normal ovaries, specifically in the pediatric age group. Due to various larger follicles on the ovary, pregnant women and patients receiving medical interventions have a higher probability of conceiving [9].

2.3 Pathobiology

Torsion arises when the ovary bends over through the utero-ovarian ligament and, indeed, the infundibulopelvic ligament. This causes edema and blood float constriction. To begin with, the venous outflow is impeded, and eventually, arterial inflow is also hindered due to increasing edema, resulting in ovarian necrosis, infarction, bleeding, and potentially peritonitis. Ordinarily, the right side of the torsion is more apparent than for the left side, which is thought to be due to a larger space inside the right pelvis due to the location of the sigmoid colon on the left [11]. As in adulthood, most children with ovarian torsion have disease within the affected ovary or tube, which is likely to cause the unusual twisting [12, 13]. A causal cause for adnexal torsion in adolescent cohorts is found in 64% to 80% of instances [8]. In extensive pediatric studies, the prevalence of associated ovarian disease ranged from 51% to 84% [14,15]. Pathologic observations in the pediatrics age group with adnexal torsion include benign cystic teratomas, hematoma or follicular cysts, para tubal cysts, cystadenoma, and hydrosalpinx.

Torsion is another frequent complication of ovarian cysts. In children, functional ovarian cysts frequently expand as a result of disrupted endocrinal changes. This is generally placed at different peak periods: the fetal stage within the first 12 months of life and throughout the birth. Ovarian cyst development in the latter stage is linked to changes through gonadotropin secretion, and upwards to 20% of women could also have multicystic and larger ovaries at the start of menstruation [16]. The follicular cysts and corpus luteal cysts grow throughout the menstrual period but usually resolve within months.

3. CLINICAL EVALUATION

Torsion discomfort is mainly caused by obstruction of the vascular pedicle, which results in tissue damage [17]. Torsion often manifests as an acute onset of discomfort in the pelvic area, with emission to the backline or thighs. Nevertheless, around half of individuals may also appear with this type of discomfort [18]. The pain can manifest more subtly, particularly in individuals with a history of ovarian cysts, polycystic ovarian syndrome, or other pelvic disorders [19,20]. All such pain bouts might occur over many days to months before the analysis is completed on occasion [17]. Manifestations can sometimes be ambiguous, ranging from asymptomatic to significant pelvic or abdominal discomfort, stomach cramping, nausea, or vomiting [21]. Because the ovary can torse and de-torse with changes in activity, the pain may be consistent or inconsistent [17]. Patients may indeed present with fever, hypertension, and sinus tachycardia [19]. Various sequelae of pain, such as appendicitis, renal colic, pyelonephritis, ectopic pregnancy, or even colitis, might have important clinical implications [22]. Ovarian torsion may just be the forecast in certain suspected situations because of the widespread nature of the presentations. If early laboratory and radiological testing are negative and the patient's discomfort persists, an assessment for ovarian torsion might be considered.

As many as 30% of torsion patients seem to have no soreness on examination, which may mistakenly deceive the practitioner [18]. Notwithstanding the discomfort, the proprioceptive exam has not even been proven to be very useful in ruling in or ruling out pelvic disease. In a prospective cohort study of 186 female patients with severe stomach pain, emergency doctors were graded entirely on their agreement among different results on the proprioceptive assessment. The existence or lack of palpable cervical movements' compassion, uterine tenderness, adnexal tenderness, adnexal masses, and uterine size were also considered [23]. On average, emergency physician inter-examiner reliability for detecting pelvic burdens on proprioceptive exam was just 23%. A similar investigation discovered an inter-examiner remarkable concurrence on the existence of adnexal tenderness of just 32% [23]. The investigators did not discuss variations in emergency physicians' abilities to find adnexal

hundreds of any particular size, which is a flaw in this study.

On proprioceptive inspection, gynecologists appear to go above and beyond when checking for adnexal burdens, discomfort, or other anomalies. Padilla et al. discovered in a 2000 study that independent of training level or comprehension, the responsiveness of identifying an adnexal mass > five cm by gynecological physical exam underneath anesthesia fluctuated from 15–36 percent, but the specificity increased 79–92 percent [24]. The significant predictive values varied from 26 to 69 percent. As a result, the researchers note that the sensitivity of a proprioceptive assessment to identify ovarian tumors more significant than five cm was extremely poor. Furthermore, regardless of skills or experience, the pelvic inspection somehow does not appear to be especially beneficial for diagnosing ovarian disease [24].

Even though ultrasonography appears to be superior to proprioceptive inspection, it has limits. Transvaginal ultrasonography with Doppler is the preferred standard step in the assessment of ovarian torsion [25]. However, ultrasonography is restricted by operator inconsistency, and it is designed to perceive non-gynecologic causes of lower abdominal pain [26]. Despite Doppler, ultrasound is not a perfect or distinct tool for identifying ovarian torsion [27]. Torsion cannot be ruled out entirely with recurrent Doppler arterial slide. This is presumably because twisting primarily creates lymphatic and venous blockage and subsequently disrupts arterial dispersion [28]. In a retrospective examination of 58 instances of ovarian torsion, 34 participants underwent sonography, and 26 of these individuals also had Doppler visualization [29]. Only 11% of those without Doppler scanning were accurately defined with torsion, but 81 percent of people with Doppler imaging were appropriately distinguished [29].

Patients diagnosed with ovarian torsion showed normal vascular perfusion among the 26 females assessed with Doppler imaging [29]. Ben-Ami et al. performed a prospective study on 65 non-pregnant women who had ultrasonography and, after that, laparoscopy [30]. Relying on laparoscopic results, 50 patients were free of torsion, whereas 15 were eventually diagnosed with ovarian torsion. All 15 patients had normal venous Doppler flow, but only five had periodic vascular progression. In this study, the high-quality prediction fee for torsion in the lack of vascular slide was reported to be 94 percent [30]. Ordinarily, vascular displacement is affected first when torsion occurs. As a result, for some time, Doppler ultrasonography may discern peripheral arterial glide [31]. Doppler ultrasonography constraints in pregnant patients with ovarian torsion have also been observed [27]. A dynamical slip could be present in another few torsion patients due to periodic torsion, incomplete torsion, or the availability of additional blood flow via uterine artery collaterals [20].

4. MANAGEMENT AND TREATMENT

The torsion approach is challenging since the symptoms during pregnancy lack consistency. According to earlier research [32], the majority of instances occurred in the first trimester, although torsion might occur even in the third trimester: eight individuals encountered torsion in the third trimester. Almost most of the patients had indeed been hospitalized to the emergency unit due to acute or persistent low abdominal discomfort [33]. With an incidence rate of up to 70% [34], nausea and vomiting constituted pretty much every single common symptom following agony. In the emergency unit, ultrasound is the often used radiographic tool to evaluate acute abdominal pain during pregnancy. Doppler sonography is presently being advocated as a valuable technology for improving pre-surgical torsion diagnosis.

However, only several investigations have found that the Doppler finding has a high false-positive rate. Smorgick et al. stated that a regular Doppler glide was discovered in 60% of torsion cases in pregnant women. According to Hasson et al., only 39% of torsion cases in pregnant girls had no blood glide at the Doppler examination. According to Ginath et al. [35], the Doppler diffusion study discovered a shortage of arterial supply in 70% of pregnant women. In the current study, 37.5% of the patients showed a steady Doppler floated pattern. The explanation for the high false rate might be that the degree of vascular degradation varies based on the number of twists, stiffness, and duration of torsion, which could also result in transient or permanent vascular constriction. As a result, the surgical approach should not be chosen primarily on my results on blood leakage but rather on the therapeutic indication of torsion.

Furthermore, the gravid uterus may move the twisted mass, resulting in the mass are often not recognized, which would contribute to a

poor outcome. Due to the larger uterus, ultrasonography failed to yield the twisted mass in two patients in our study. There is a mounting consensus that MRI can be utilized to examine acute abdominal pain in pregnancy, particularly when appendicitis cannot be ruled out, and a mass cannot be found by sonography [36].

Laparoscopy, the same as in non-pregnant women, has emerged as a frequent and safe means of surgical therapy for torsion in pregnant women. Hasson et al. reported the laparoscopy was performed in 88 percent of pregnant ladies with torsion. Daykan et al. conducted a study wherein 85 pregnant women with torsion were included, and 78 (91.7 percent) of the individuals underwent laparoscopy [37]. Laparoscopy can be performed throughout the third trimester by skilled surgeons. Chohan [37] successfully performed laparoscopic surgery on a female experiencing fallopian tube torsion at 35 months of pregnancy. It is being demonstrated that laparoscopic procedure seems to have little influence on antenatal consequences compared to laparotomy [34] and therefore does not exacerbate headaches associated with thromboembolism. When contrasted to non-pregnant women with torsion, pregnant women were more likely to seek preventative surgical treatment. Existing literature has shown that 30 percent of patients had preventative surgical management, with distortion being the most common procedure [35].

According to Hasson et al. [38], the likelihood of recurring in the same pregnancy of torsion amongst pregnant women who had distortion was just 19.5 percent. Pansky et al. [39] discovered that perhaps the exacerbations incidence of distortion surgery was only 20%, even though there was no resurgence in patients who received cystectomy or oophorectomy. In comparison to the previous study, cystectomy may also eliminate the risk factors for relapse. Daykan et al. [40] discovered that perhaps the total postoperative impulsive abortion valuation was 3.5% in a comparable size examination. However, all happened more than two weeks following the surgical process, and then they were never more thought to be associated with the surgical intervention. Before the actual maturation of the placenta, removing the ovary or corpus luteum may also reduce the amount of progesterone needed to maintain embryo development.

5. CONCLUSIONS

Ovarian torsion is a rare yet life-threatening condition in females. To protect the efficacy of the ovaries and tubes and avoid excessive comorbidity, an initial diagnosis is required. Ovarian torsion is the total or partial twisting of the adnexal underpinning structure in the presence of hypoperfusion. It has the potential to affect females of all ages. Ovarian torsion develops in around 10% of patients who have had adnexal burdens surgically treated. An ovarian mass is the most common danger in ovarian torsion. The most typical sign of ovarian torsion seems to be a severe complication of pelvic agony accompanied by nausea and vomiting.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/78054