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Original Research Article

Comparison of adnexal torsion in different phases of women's life: a retrospective cohort study

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ABSTRACT

Background: Ovarian torsion is one of the most common causes of emergency surgery in gynecology. Though it is more common in reproductive age group, it can occur in extremes of age group. So, we had analysed the clinical presentation, surgical characteristics, and causes of adnexal torsion among adolescent population, reproductive-age women, and postmenopausal women.

Methods: Patients with adnexal torsion who were treated in department of obstetrics and gynecology, SRM Medical College Hospital and Research Centre from October 2016 to March 2019 were retrospectively analyzed.

Results: Among the 53 cases of adnexal torsion during the study period, maximum (38, 71.6%) were in the reproductive age group. There were three patients with ovarian torsion during pregnancy. Acute pain abdomen was the significant presenting symptom in adolescent group compared to other two group (100% versus 80.6% versus 40%, $p = 0.03$). Adnexal pathology was in the ovary in 76% and isolated tubal pathology in 5%. Bilateral salpingo-oophorectomy with or without total abdominal hysterectomy was more commonly performed in postmenopausal patients (100%), as opposed to conservative surgery- detorsion and cystectomy in premenopausal women (56%). In Adolescent patients 62% had polycystic ovaries as intraoperative finding. Histopathology were benign except for a patient in postmenopausal age group who had granulosa cell tumour.

Conclusions: An early identification of adnexal torsion is necessary in order to achieve conservative treatment in order to maximize the future reproductive potential in younger patients.

Keywords: Adnexal torsion, Adolescent, Postmenopausal, Salpingo-oophorectomy

INTRODUCTION

Adnexal torsion is the fifth most common gynaecologic emergency.¹ Though it is a disease process of reproductive aged women, it is also seen in the extremes of age. Early diagnosis and surgery are essential to protect ovarian and tubal function in young patients as delay in treatment can lead to impaired or lost fertility.² Early diagnosis poses a difficult challenge because the clinical presentation is variable and often misleading. Adnexal torsion can also mimic malignancy as it presents not only acutely but can take a subacute, intermittent, or

chronic course. Delayed or missed diagnosis is common especially in women in the post-menopausal age group.³ The torsion may occur in the normal ovary but is usually secondary to a pre-existing adnexal mass. The mechanism of torsion is likely related to the increased size and weight of the involved ovary.⁴ Historically, the treatment for adnexal torsion was oophorectomy due to belief that leaving a nonviable ischemic ovary may lead on to infection and reoperation, missing a malignancy and potential risk of thromboembolism from untwisting ovarian vessels. The treatment is changing to favour adnexal detorsion with ovarian conservation to preserve

ovarian function.⁴ The objective of this study was to analyse and compare the clinical presentation, surgical characteristics, and causes of adnexal torsion among adolescent population, reproductive-age women, and postmenopausal women.

METHODS

Patients who were diagnosed with adnexal torsion in the department of obstetrics and gynecology, SRM Medical College Hospital and Research Centre from October 2016 to March 2019 were retrospectively studied. A total of 53 patients with adnexal torsion were studied. Patients who were operated for torsion with age of 13 to 65 year were included in study. Those patients who were clinically diagnosed as torsion but negative findings intra operatively were excluded. As it was a retrospective data collection patient consent was not required. Socio-demographic factors, clinical presentation, surgical characteristics and causes of adnexal torsion of each patients were analyzed. Patients with adnexal torsion were divided into three groups:

- Adolescent: 13-19 years
- Reproductive age group: 19- 45 years
- Postmenopausal group.

Statistical analysis

All the details were analyzed under these three groups and results were compared. SPSS 17.0 was used.

Frequency and percentage were used to describe data. Chi square test was used to analyze the data. p value of less than 0.5 was considered significant.

RESULTS

During the study period there were 53 cases of adnexal torsion. Among them, 10 (18.8%) were in the adolescent age group, 38 (71.6%) were in the reproductive age group and 5 (9.4%) were postmenopausal group. There were 3 (5.6%) cases of ovarian torsion in pregnancy.

All patients with adnexal torsion in adolescent age group and postmenopausal group presented with pain abdomen whereas 86% of patients in reproductive age group had pain abdomen as presenting symptom. Acute pain abdomen was significantly more in adolescent age group when compared to reproductive age group and postmenopausal group (100% versus 80.6% versus 40%, $p=0.03$). In 60-65% of patients with adnexal torsion abdominal tenderness was the clinical finding present in all 3 groups. Abdominal mass was present in 80% in postmenopausal group compared to 36.8% in reproductive age group and 10% in adolescent group which was statistically significant ($p = 0.02$). The main indication among postmenopausal patients for surgery was palpable abdominal mass (80%) and more premenopausal patients underwent surgery with a clinical suspicion of adnexal torsion (86%). Abnormal uterine bleeding was present in 30% versus 18.4% versus 24% in adolescent group, reproductive group and postmenopausal group respectively (Table 1).

Table 1: Clinical features.

Parameters	Adolescent age (10)	Reproductive age (38)	Postmenopausal (5)	Chi square	p value
Abdominal pain					
Acute	10 (100%)	31(86.6%)	(100%)	3.18	0.203
Duration between onset of pain and reporting	10 (100%)	25 (80.6%)	2 (40%)	6.72	0.034
<24 hours	2 (20%)	16 (64%)	1 (50%)	5.54	0.062
>24 hours	8 (80%)	9 (36%)	1 (50%)	-	-
Chronic	-	6 (19.4%)	3 (60%)	-	-
Abdominal distension	-	10 (26.3%)	3 (60%)	6.71	0.034
Abnormal uterine bleeding	3 (30%)	7 (18.4%)	1 (20%)	0.65	0.723
Vomiting	5 (50%)	16 (42.1%)	1 (20%)	1.26	0.534
Fever	2 (20%)	5 (13.1%)	-	1.16	0.559
Abdominal mass	1 (10%)	14 (36.8%)	4 (80%)	7.16	0.028
Tenderness	6 (60%)	25 (65.7%)	3 (60%)	0.16	0.924
Tachycardia	2 (20%)	10 (26.3%)	1 (20%)	0.23	0.890
Free fluid	4 (40%)	8 (21%)	2 (40%)	1.99	0.370

Emergency surgery was significantly more common in adolescent group when compared to reproductive age group and postmenopausal group (90% versus 60.5% versus 20%, $p = 0.02$) whereas planned elective surgery was more in postmenopausal group (80%). Laparoscopy

was performed in 80% in adolescent group, 76.3% in reproductive age group and none in the postmenopausal group which was statistically significant ($p=0.002$). Adnexal pathology was in the ovary in 76% and isolated tubal pathology in 5% in reproductive age group. Ovarian

tumour >20 cm was seen in 40% in postmenopausal age group compared to 5.29% in reproductive age group. Extensive surgery including bilateral salpingo-oophorectomy with or without total abdominal hysterectomy was more commonly performed in postmenopausal patients (100%), as opposed to conservative surgery like de-torsion and cystectomy in premenopausal women (57.8%). In younger age group, 50% had oophorectomy due to late presentation and in 20% had ovarian de-torsion with oopheropexy, 20% had ovarian de-torsion with cystectomy. In adolescent

patients 62% had polycystic ovaries as intraoperative finding (Table 2).

In adolescent group, 50% had gangrenous necrosis compared to 10% in reproductive group. Functional cyst was seen in 20% in adolescent group compared to 10.5% in reproductive age group. Borderline serous cystadenoma was seen in one patient in reproductive age group and one patient in postmenopausal group had granulosa cell tumour (Table 3).

Table 2: Surgery details.

Parameters	Adolescent age	Reproductive age	Postmenopausal	Chi square	p value
Elective	1 (10%)	15 (39.4%)	4 (80%)	7.12	0.028
Emergency	9 (90%)	23 (60.5%)	1 (20%)		
Laparoscopy	8 (80%)	29 (76.3%)	0	12.82	0.002
Laparotomy	2 (20%)	9 (23.7%)	5 (100%)		
Unilateral					
Right	6 (60%)	19 (50%)	3 (60%)	3.717	0.445
Left	4 (40%)	18 (47.3%)	1 (20%)		
Bilateral	-	1 (2.7%)	1 (20%)		
Ovarian	9 (90%)	29 (76.3%)	5 (100%)	1.287	0.863
Isolated tubal	-	2 (5.2%)	-		
Para ovarian cyst	1 (10%)	7 (18.4%)	-		
No. of twists					
1	3 (30%)	17 (44.7%)	3 (60%)	1.32	0.517
>=2	7 (70%)	21 (55.2%)	2 (40%)		
Size					
< 5 cm	3 (30%)	6 (15.7%)	-	4.971	0.547
5-10 cm	5 (50%)	20 (52.6%)	3 (60%)		
10-20 cm	2 (20%)	10 (26.3%)	-		
> 20 cm	-	2 (5.29%)	2 (40%)		
PCOS	5 (50%)	4 (10.5%)	-	9.88	0.007
Laparotomy	2	9	5	12.82	0.002
Detorsion + ovarian cystectomy	-	-	-		
Salphingo-oopherectomy	2 (20%)	5 (16.1%)	-		
Bilateral salphingo-oopherectomy	-	-	1 (20%)		
TAH+BSO	-	3 (9.6%)	4 (80%)		
Staging laparotomy	-	1 (3.2%)	-		
Laparoscopy	8	29	-		
Detorsion + oopheropexy	2 (20%)	3 (10.3%)	-		
Detorsion+ ovarian cystectomy	2 (20%)	10 (26.3%)	-		
Paraovarian cystectomy	1 (10%)	7 (18.4%)	-		
Salpingo -oopherectomy	3 (30%)	7 (18.4%)	-		
Salpingectomy	-	2 (6.8%)	-		

There were 3 cases of ovarian torsion in pregnancy. First patient was 14 weeks pregnant with 10×12 cm mucinous cystadenoma for whom left salpingo-oopherectomy was done by laparotomy. Second patient was 16 weeks pregnant who had 8×8 cm simple cyst for whom laparoscopic cystectomy was performed. Third patient was G2A1 at 6 weeks of pregnancy presented with

torsion. Laparoscopy showed 8 × 6 cm uninoculated cyst twisted twice and it was a serous cystadenoma.

DISCUSSION

Ovarian torsion is defined as partial or complete rotation of the ovarian vascular pedicle causing obstruction to

venous outflow and arterial inflow. Though it is most common in reproductive age group it is reported in both prepubertal girls and postmenopausal women. According to Feng et al, 15% of cases occur during childhood, and 15% of cases occur during or after menopause.⁵ In this study adnexal torsion was seen in 18.8% in adolescent group, 71.6% in reproductive age group and 9.4% in postmenopausal group. Adnexal torsion has varied symptoms and signs at presentation. Most common symptom is acute onset of lower abdominal pain,

followed by nausea and vomiting. Clinical symptoms of adnexal torsion are nonspecific in postmenopausal women.^{3,4} Cohen et al reported continuous dull pain as the most common presenting symptom in postmenopausal group (57%) and acute-onset sharp pain as the predominant symptom in premenopausal group (86%).⁶ In this study, pain abdomen was the most common symptom in all age group. Acute onset of pain was seen in 100% in adolescent and 40% in postmenopausal age group.

Table 3: Histopathological findings.

Parameters	Adolescent age 10 (%)	Reproductive age 38 (%)	Postmenopausal 5 (%)
Functional cyst	2 (20%)	4 (10.5%)	-
Serous cyst	-	8 (21%)	1 (20%)
Mucinous cystadenoma	-	4 (10.5%)	1 (20%)
Dermoid	-	5 (13.1%)	1 (20%)
Hydrosalpinx/haematosalpinx	-	2 (5.2%)	1 (20%)
Para ovarian cyst	1 (10%)	7 (18.4%)	-
Gangrenous necrosis	5 (50%)	4 (10.5%)	-
Borderline serous cystadenoma	-	1 (2.6%)	-
Granulosa tumour	-	-	1 (20%)
No HPE	2 (20%)	3 (7.8%)	-

In the study by Herman et al, more than 80% patients with ovarian torsion had ovarian masses of 5 cm or larger, indicating that the primary risk in ovarian torsion is an ovarian mass.⁷ In this study majority of patients (50-60%) in all age group had ovarian masses between 5-10 cm. 40% of women in postmenopausal age group had mass >20 cm when compared to 6.6% in reproductive age group.

Herman et al, reported complex ovarian masses and larger ovarian tumour among postmenopausal patients.⁷ Torsion usually occurs unilaterally with 70% of cases seen on the right side. Longer utero-ovarian ligament on right side and limited space on left side due to presence of the sigmoid colon is the reason for right side adnexal torsion. In the study by Nair et al, adnexal torsion of the right side was about 55.7% when compared to the left side.⁸ Melcer et al, found in their study to have right sided torsion in 62.5% while only 36.5% of cases had pathology on left side and remaining 1% were found to have bilateral involvement.⁹ In this study, 60% adnexal torsion was in right side in adolescents and postmenopausal group and 50% in reproductive age group. Bilateral torsion was seen in 1 patient in reproductive group and postmenopausal group. Ovarian torsion in pregnancy is reported in 10-17%. Incidence was higher at 10-17 weeks of gestation and ovarian masses larger than 4 cm.^{4,10} In this study, incidence of ovarian torsion in pregnancy was 5.6%.

Histological diagnosis varied among different age groups. In this study, in adolescent group in 50% due to gangrenous necrosis, histopathology could not be studied, functional

cysts was seen in 20%. In reproductive age group, serous cyst and para-ovarian cyst were seen in 20%. Feng et al, reported in children and adolescents, the most common histo-diagnosis was a normal ovary. Teratoma, followed by a normal ovary, was the most common diagnosis in fertile women. In postmenopausal cases, teratoma was the most common histological type.⁵ In the study by Spinelli et al, in adolescents ovarian torsion occurred in 56.7% on ovaries with functional lesion, in 23.3% on normal adnexa and in 20% on ovaries with benign neoplasm.¹¹ The incidence of ovarian torsion with ovarian malignancy was <2%.⁴ Due to fixity and adhesion, malignant as well as endometriotic cyst rarely undergoes torsion.⁶ In this analysis, one patient in the postmenopausal age group had granulosa cell tumour and one in reproductive age group had borderline serous cystadenoma.

Mainstay of the treatment for ovarian torsion was surgical evaluation and preserving ovarian function. Earlier the diagnosis of torsion, the higher is the chance to preserve ovarian function. In an animal study by Taskin et al, necrosis might develop after occlusion of ovarian vessels for longer than 36 hours.¹² As the time interval between symptoms to surgery is more the rate of ovarian conservation is reduced. In the study by Nair et al, the time interval from admission to the surgery was 24 hours (median) and 38 cases (54.3%) had conservative surgery.⁸ Time interval between symptoms and reporting >24 hours was 75% in adolescent group in this study. Herman et al, reported extensive surgery including bilateral salpingo-oophorectomy with or without total abdominal hysterectomy was more commonly performed in postmenopausal patients, as opposed to conservative surgery

in premenopausal surgeries.⁷ In this study in postmenopausal group, 4 patients had undergone TAH +BSO and 1 patient had undergone bilateral salpingo-oophorectomy.

CONCLUSION

Adnexal torsion requires a high index of clinical suspicion for diagnosis as the symptoms are non-specific. Presentation of adnexal torsion is similar in paediatric and reproductive-age and pregnant women but the underlying adnexal pathology may be different. Post-menopausal torsion carries increased morbidity due to the increased likelihood of malignancy and complications of associated medical and surgical treatment of the mass. An early identification of adnexal torsion is necessary in order to achieve conservative treatment in order to maximize the future reproductive potential in younger patients.

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