



Gynecological Problems in Children: An Epidemiological Study at a Tertiary Level Hospital in Bangladesh

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Authors' contributions

This work was carried out in collaboration among all authors. Author TKC designed the study, performed the statistical analysis, and wrote the first draft of the manuscript. Authors TFR, AS and RK collected the data. Author SA reviewed and edited the first draft. Authors TAC and MAAF edited and approved the final draft. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Gynecological diseases in children are not similar to those that affect the adult. The aim of the study was to find out the pattern of gynecological problems in children presenting at a tertiary level hospital.

Study Design: Retrospective chart review.

Place and Duration of Study: Department of Pediatric Surgery, Chittagong Medical College Hospital between January 2017 and June 2020.

Methodology: This retrospective study was conducted on all admitted and outdoor patients with gynecological diagnoses. Demographic characteristics, type of problem, treatment and outcome

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were recorded among admitted patients. Patients with trauma to the external genitalia or perineum were analyzed for mechanism of injury, seasonal and age group variations, other associated injuries, and treatment.

Results: There were 168 admitted and 300 outdoor patients. Age ranged from 3 days to 14 years among the admitted patients (mean 6.22 ± 3.41 years, median 7 years). Majority of the patients in OPD had labial adhesions (273, 91%) and majority of the admitted patients had trauma to the genitalia (86, 51%) followed by foreign body impaction (35, 21%) and birth defects (29, 17%). Ovarian dermoid (9, 5.36%), twisted ovarian cyst (9, 5.36%), disorders of sex development (DSD) (6, 3.57%) were the commonest diseases. There were significant differences among age groups with regards to congenital and acquired conditions ($P=0.00$). Surgical procedures were performed in 92 (54.76%) patients and 76 (45.24%) patients had medical management.

Conclusion: Gynecological problem may present in females at any age. Patterns vary between admitted and OPD patients. Labial adhesion, genital trauma and ovarian cysts are common among them. Sexual assaults on the young girls are areas of major concerns.

Keywords: Pediatric Gynecology; labial adhesion; ovarian cyst; genital trauma; DSD; epidemiology.

1. INTRODUCTION

Gynecological conditions in children are gaining more attention worldwide. Although these problems are not so common to demand public health concerns, when they occur, they cause significant anxiety among parents because of the fear of potential fertility compromise or disfigurement [1]. Some of the conditions may be life threatening also. A girl undergoing her first gynecological examination should be treated with particular care to avoid future psychological and reproductive health impact. During the past two decades there have been major advancements in perinatology, neonatology, obstetrics and pediatric radiology and many genital tract anomalies are now being diagnosed during fetal life and early childhood [2]. Knowledge of these conditions is, therefore, important for the general practitioners, pediatricians, pediatric surgeons and gynecologists.

The genital tract in girls is different from that of adult females [3]. There are age-dependent physiological and anatomic differences. Pediatric and Adolescent Gynecology is a subspecialized area which is present as separate clinics or departments in many hospitals in the developed country [4]. The first Pediatric and Adolescent Gynecological clinic was started at the Chicago children's memorial hospital in 1950 [4,5]. In 1988, separate gynecological outpatient clinic was established in a hospital in Finland for girls less than 15 years old, and this has been replicated in many developed countries [6]. The British Society for Pediatric and Adolescent Gynecology was established in the year 2000 [7]. This subspeciality has not yet been established in many low-and middle-income countries

(LMICs) and there is paucity of literature from Bangladesh regarding various childhood gynecological disorders. This may cause low index of suspicion among health care providers about these conditions leading to faulty diagnosis and inappropriate treatment.

Unfortunately, many physicians experience difficulties assessing the genitalia of prepubertal girls. One study showed that the participants of a formal training program in Pediatric and Adolescent Gynecology were correct in only about half of the cases. While they could identify some rare diseases, many missed some common conditions [8]. The finding of the study emphasizes the need for the physicians caring for these young patients to be familiar with these conditions. In this hospital, girls with surgical problems related to gynecology are treated in the department of pediatric surgery if they are less than 12 years of age and after that, in the department of obstetrics and gynecology. The aim of this study was to analyze the gynecological problems in children to establish an insight into pediatric and adolescent gynecological disorders encountered in a tertiary care center. It is hoped that the findings of this study will help to increase awareness among practitioners about childhood gynecological disorders.

2. MATERIALS AND METHODS

2.1 Study Design and Settings

This was a retrospective study carried out in the Department of Pediatric Surgery, Chittagong Medical College Hospital (CMCH), which is a tertiary level academic hospital and the largest

government referral center for pediatric surgical services for the South East part of Bangladesh. All children with gynecological problems attended in this department from January, 2017 to June, 2020 were included in the study. Data were collected from records of both admitted patients and patients attended in the out-patient department (OPD). Patients with anorectal malformations (vestibular fistula, recto-vaginal fistula, perineal fistula, cloacal anomaly), Bladder or cloacal exstrophy-epispadias complex, urinary tract infection were excluded from the study. Patients of disorders of sex difference (DSD) who were raised as males and a male sex was assigned were also excluded from the study.

2.2 Data Collection and Analysis

In admitted patients, age, date of admission, type of disease, treatment and outcome were recorded. Patients with trauma to the external genitalia or perineum were further analyzed to describe mechanism of injury, seasonal and age group variations, other associated injuries, and treatment. Patients with leech bite in the genitalia were analyzed for seasonal variation. For patients who attended the OPD, only the frequency of the disease was calculated due to irregularity and incompleteness of the records. Children were classified into infants (up to 1 year), toddlers (1-3 years), preschool (3-6 years) and school-age children (6-12 years). There are six seasons in Bangladesh and these are Winter (mid-December to mid-February), Spring (mid-February to mid-April), Summer (mid-April to mid-June), Rainy Season (mid-June to mid-August), Autumn (mid-August to mid-October), and Late Autumn (mid-October to mid-December) [9]. Compiled data were coded in unique alphanumeric codes for each variable and subjected to statistical analysis using both Microsoft Excel 2019 and SPSS version 22; and cross checked to correct errors. Categorical variables were described as frequency and percentage and compared using Chi-square test. Continuous variables were expressed as mean \pm standard deviation or median, and comparison was done by independent sample t test. P value < 0.05 was considered to be significant. Confidentiality was maintained using unique identifiers and by password protected data entry software with restricted users.

3. RESULTS

During this study period, a total of 300 patients attended in the OPD and 168 patients were admitted in the ward. Table 1 lists the

gynecological conditions in these patients.

Among the admitted patients, 121 (72%) were due to "trauma or foreign body (FB) impaction" in the genitalia and 47 (28%) were due to gynecological diseases. Age ranged from 3 days to 14 years, mean 6.22 ± 3.41 years and median 7 years (IRQ 3.5-9 years). Majority of the admitted patients were due to trauma to the genitalia (51%) followed by foreign body impaction (21%) and birth defects (17%). All the FBs in the vagina were paddy. Among the patients with DSD, there were congenital adrenal hyperplasia (CAH, 2), mixed gonadal dysgenesis (2), complete androgen insensitivity syndrome (1) and Ovo testicular DSD (1). Fig. 1 depicts classification of the type of conditions among the admitted patients.

There was no significant difference in mean ages between patients with "birth defect or congenital anomaly" and patients with acquired conditions (mean 5.21 ± 4.58 years vs 6.43 ± 3.09 years, $P=0.08$). However, there was significant differences among age groups with regards to congenital and acquired conditions and there is a gradual rise of acquired conditions among increasingly older age groups ($P=0.00$) (Fig. 2). There was no significant difference in age between patients with gynecological diseases and "trauma or FB" (mean 5.9 vs 6.3 years, $P=0.54$).

Fig. 3 shows that inflammatory conditions and birth defects had a lower median age and developmental disorders had a higher median age. Among patients who had gynecological diseases, neonate, infant, toddler, pre-school age and school age children were 5,5,5,9, and 22 respectively. On the other hand, for trauma patients these were 1, 1, 23, 32, and 64 respectively. Among the patients of gynecological diseases, majority were in 0-5 years age group (24/47, 51.06%), while majority of trauma patients were in 6-10 years age group (68/121, 56.20%) ($P=0.00$). Table 2 lists the age distribution of admitted patients with common conditions.

Fall from a height was the most common cause of genital trauma in these patients (42, 49%). Fig. 4 shows the mechanism of trauma among admitted patients. Majority of the trauma (60, 70%) involved multiple genital parts followed by isolated injury to vagina (13, 15%), labia minora (6, 7%), labia majora (5, 6%) and posterior fourchette (2, 2%). Frequency of trauma and FB

was more during Spring (23, 24%), followed by Summer (20, 21%), Winter (16, 17%), Late Autumn (16, 17%), Rainy season 9 (11, 11%), and Autumn (10,10%). Frequency of leech bite was more during Autumn (9, 36%), followed by Summer (8, 32%), Rainy Season (5, 20%), Late Autumn (2, 8%) and Spring (1, 4%).

done in 76 (45.24%) patients. Surgery included surgical repair (54), excision of cyst or tumors (19), salpingo-oophorectomy (7), excision of vaginal septum (3), laparoscopic excision of ovarian cyst (2), hymenectomy (2), incision drainage (2), feminizing genitoplasty (1), vaginoplasty (1) and diagnostic laparoscopy (1). The histopathological reports of the excised ovarian cysts were not available for further categorization of these cysts.

Surgical interventions were performed in 92 (54.76%) patients and medical management was

Table 1. List of patients admitted in the ward or attended in the OPD

| Diagnosis | No | % | Diagnosis | No | % |
|----------------------------------|----|-------|---------------------------|-----|-------|
| Admitted patients (n=168) | | | | | |
| • Genital trauma | 86 | 51.19 | • Malignant ovarian mass | 1 | 0.60 |
| • Leech bite in vagina | 25 | 14.88 | • MRKH syndrome | 1 | 0.60 |
| • FB vagina | 10 | 5.95 | • PCO | 1 | 0.60 |
| • Ovarian dermoid | 9 | 5.36 | • Vaginal agenesis | 1 | 0.60 |
| • Twisted ovarian cyst | 9 | 5.36 | • Vulval abscess | 1 | 0.60 |
| • DSD | 6 | 3.57 | • Total admitted patients | 168 | 100 |
| • Benign ovarian cystadenoma | 4 | 2.38 | OPD (n=300) | | |
| • Vaginal septum | 3 | 1.79 | • Labial adhesion | 273 | 91.00 |
| • Redundant vaginal mucosa | 2 | 1.19 | • DSD | 7 | 2.33 |
| • Labial adhesion | 2 | 1.19 | • FB vagina | 6 | 2.00 |
| • Neonatal withdrawal bleeding | 2 | 1.19 | • Mastitis | 6 | 2.00 |
| • Clitoral cyst | 1 | 0.60 | • Ovarian tumor | 6 | 2.00 |
| • Hydrometrocolpos | 1 | 0.60 | • Per vaginal bleeding | 1 | 0.33 |
| • Imperforate hymen | 1 | 0.60 | • Premature thelarche | 1 | 0.33 |
| • Labial dermoid | 1 | 0.60 | • Total OPD | 300 | 100 |
| • Labial hemangioma | 1 | 0.60 | | | |

*FB= Foreign body, DSD= Disorders of sex development, MRKH= Mayer-Rokitansky-Küster-Hauser, PCO= polycystic ovary, OPD= Outpatient department.

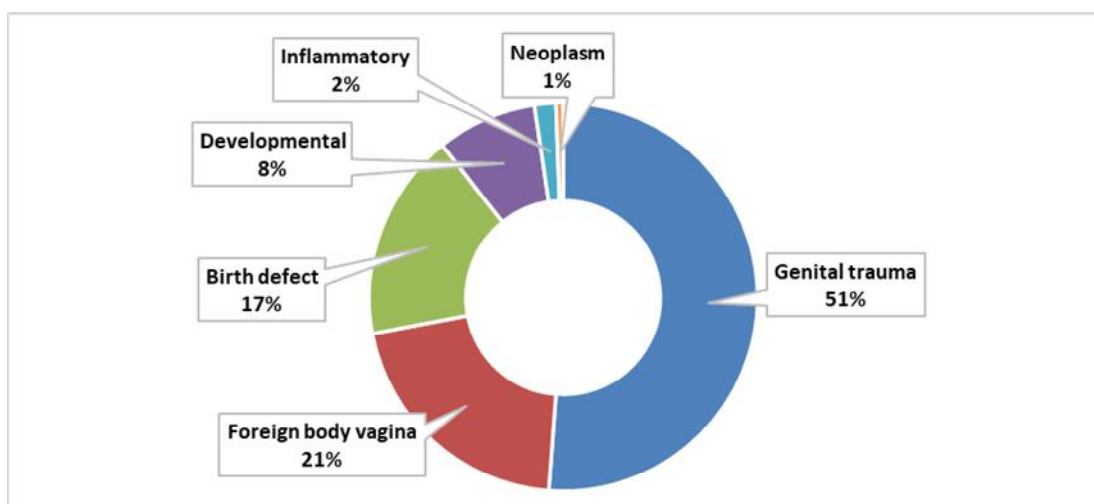


Fig. 1. Classification of conditions among admitted patients (n=168)

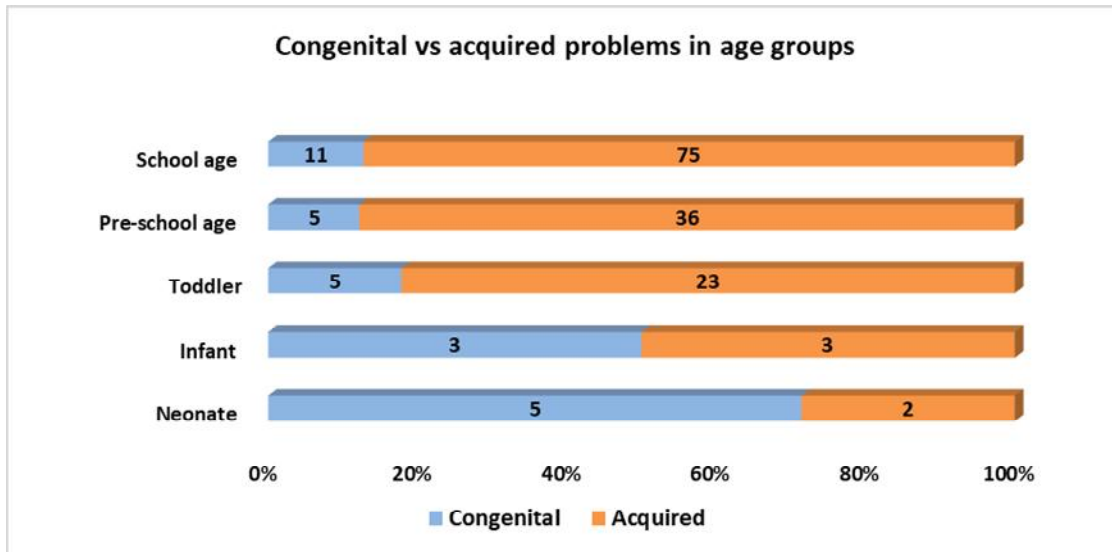


Fig. 2. Distribution of congenital and acquired problems among admitted patients of different age groups (n-168)

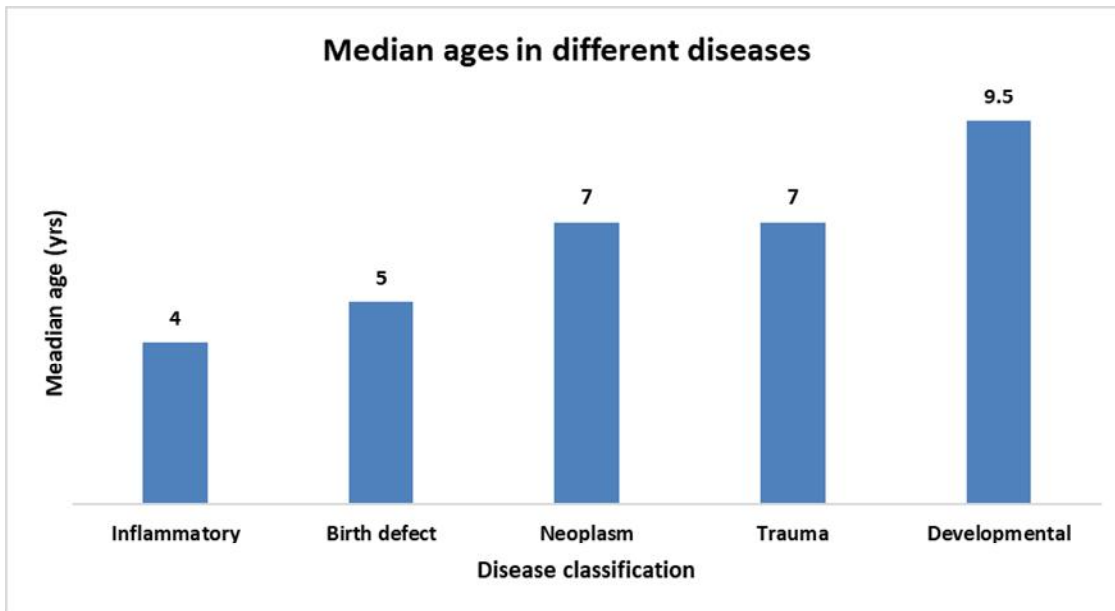


Fig. 3. Median ages of different types of diseases among admitted patients

Table 2. Age distribution of admitted patients with more common conditions

| Diagnosis | Mean age \pm SD (years) | Age range |
|------------------------------|---------------------------|-----------------------|
| Genital trauma | 6.5 \pm 2.94 | 7 days to 12 years |
| Leech bite in vagina | 6.82 \pm 2.79 | 13 months to 11 years |
| Foreign body vagina | 3.76 \pm 1.84 | 13 months to 7 years |
| Ovarian dermoid | 8.22 \pm 2.82 | 2 to 14 years |
| Twisted ovarian cyst | 7.03 \pm 4.5 | 14 days to 12 years |
| Disorders of sex development | 4.32 \pm 2.14 | 4 months to 5 years |
| Benign ovarian cystadenoma | 9.25 \pm 3.59 | 4 to 12 years |

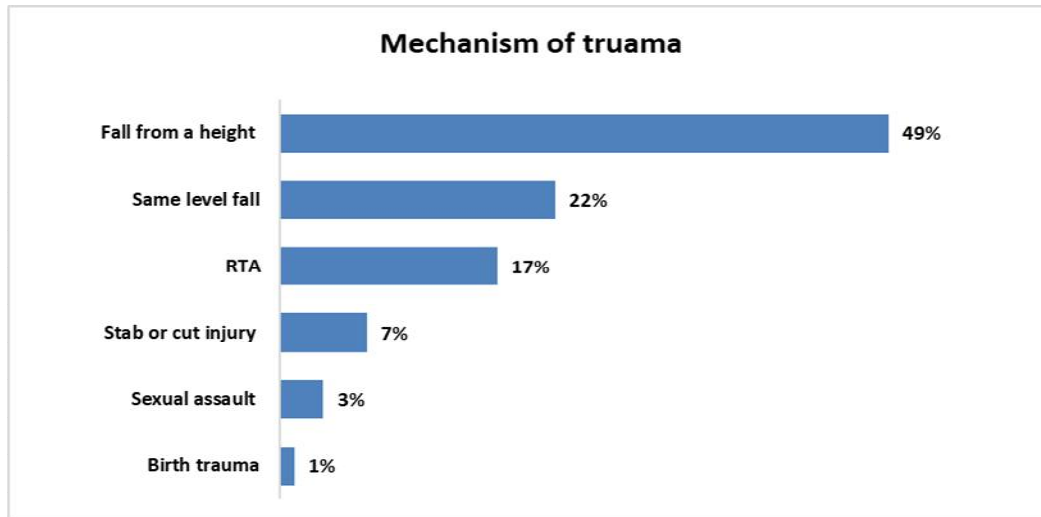


Fig. 4. Mechanism of trauma among admitted patients of genital trauma (n=86)

4. DISCUSSION

This study reports the pattern of gynecological problems in children seen at a tertiary pediatric surgical center in Bangladesh. The most frequent gynecological problems encountered were labial adhesion, genital trauma and foreign bodies, ovarian cyst and DSD. Other gynecological problems such as menstrual or pregnancy related problems, endocrinological disorders, infections, sexually transmitted diseases which are common adolescent gynecological problems as reported by other studies were not found in this study. This is due to the 12 years age limit of the patients admitted in this department [1,4,6].

Labial adhesion, also known as labial agglutination and labial synechiae, was the most common condition in the girls in this study. This is consistent with other studies [1,10]. It may occur in as many as 1-3% of the prepubertal girls [11]. It results from inflammation, combined with the normally low estrogen levels in them. Chronic vulvitis causes the denuded epithelium of adjacent labia minora to agglutinate and fuse together [10]. Triggers of labial adhesions include vaginal infections and inflammatory skin conditions (eg. lichen sclerosus) and genital trauma from straddle injury or sexual abuse. This condition is often mistaken for absence of vagina by the general practitioners. Many of the referred patients in this study were initially diagnosed as vaginal agenesis or atresia causing much worries to the parents. Female circumcision is another predisposing cause of labial adhesion. Female

circumcision is not practiced commonly in this country but is widespread in many Sub-Saharan and Asian countries [10].

Genital trauma was the second most common problem and was the commonest cause of admission among the girls in this study. A study from Kuwait reported that 5.6% of their cases were genital trauma and fall was the most common cause [6]. In this study, genital trauma was 51.19% and fall was the commonest cause. Trauma was more common during mid childhood (Fig. 4) which was the commonest age group in other studies [4,12,13]. The increased frequency of genital trauma during spring and summer is consistent with the literature and occurs as children wear thin or light garments and are involved in outdoor activities or play [14]. Three patients were sexually abused. Among all age group, adolescents have the highest rates of sexual assault in the world [15]. A study in Nigeria reported exceedingly high rate of sexual assaults and rape (54.8%) and this was most common in the 8 to 11-year age group (52.2%) [1]. On the other hand, another study from Kuwait reported no cases of sexual assaults although they treated a few cases which were referred to forensic medicine and was not available for analysis [6]. In this study also, patients of sexual assault who were treated in this department but later transferred to "one stop crisis center" (OCC), could not be included in his study as this study only analyzed patient- records from pediatric surgery department [16]. A study from India reported a 14% incidence of sexual abuse in girls [4]. A US study found that only

2.2% (26 of 1160) of sexually abused girls examined after 72 hours of occurrence had diagnostic physical findings, whereas among those examined within 72 hours, the prevalence of injuries was 21.4% (73 of 340) [17].

Leech bite in urogenital tract is a common condition in the tropical countries and 14.88% of the patients had leech bite in vagina [18,19]. Sometimes there is profuse bleeding following leech bite necessitating blood transfusion [20,21]. Although not recorded in the files, in majority of the patients there was history of leech bite and the patients came with bleeding from vagina; but on examination leech was not retrieved through normal saline wash into the vagina. Most incidents occurred during Autumn, Summer and Spring while swimming in the pond or river and the leech was dislodged by the girls. Mean age of the patients with leech bite was 6.8 years, which is consistent with another study (6.4 years) from the same city [18].

There was a total of 23 (13.69%) patients in this study who had ovarian cysts. Neonatal ovarian cyst is almost universally a functional cyst and usually does not require treatment in the neonatal period [22]. However, the only neonate who had an ovarian cyst in this study had a twisted cyst and needed excision. There was also a 3-months-old infant in this study who had twisted ovarian cyst and needed excision. Mean ages of the patients with twisted ovarian cyst, ovarian dermoid and benign ovarian cystadenoma were 7.03, 8.22 and 9.25 years, respectively. There were 9 cases of ovarian dermoid in this study. Dermoid tumors are mature cystic teratomas which are the most common ovarian tumors in childhood. These tumors constitute about 70% of benign ovarian neoplasms in women less than 30 years old [23]. They comprise several cell types and may include hair, sebaceous fluid, or calcifications. Although most dermoid tumors are benign, less than 1% can be malignant [24]. The paradigm of treatment of twisted ovarian cyst has now shifted from ovarian removal to ovarian evaluation and likely preservation [25]. Laparoscopic adnexal untwisting is reported to be successful in preserving ovarian function in 93% of cases [22]. However, in this study all the twisted cysts were completely necrosed and either excision of cyst or salpingo-oophorectomy was performed. One of the reasons of this high rate of necrosis in this study may be delayed presentation of these conditions. Although the duration of clinical presentations and investigation findings were not

analyzed in this study, delayed presentation is common in the LMICs [25,26]. Moreover, many initial ultrasound scans cannot detect ovarian torsion, especially if these are performed by underqualified sonologists without associated Doppler evaluation [25]. A very high index of suspicion is needed in this scenario for early diagnosis and treatment of these conditions. Sometimes, these are treated as acute appendicitis by physicians and an initial conservative treatment is attempted making the scenario worse [27]. The incidence of ovarian torsion is estimated to be 4.9 in 100,000 females aged 1-20 years which is similar to testicular torsion [28]. Among them, 83% occur in adolescents older than 12 years. However, only 0.4% of those are malignant. There was only one case of malignant ovarian neoplasm in this study who was 7 years old. Ovarian neoplasms constitute less than 1 % of all childhood tumors and about 8 % of all malignant abdominal tumors in children are of ovarian origin [22].

There were 6 patients with DSD in this study. Feminizing genitoplasty was performed after commencement of steroid supplementation in one patient of CAH who was 5 years old. Delayed presentation of DSD is common in the low-and middle-income countries [29]. Although, there are controversies regarding the timing of surgery for patients with DSD, many recommend performing feminizing genitoplasty in patients with CAH during the infancy but after 6 months of age [30]. Moreover, patients with CAH who are left untreated, develop male gender identity and some of them need to be raised as males; while most agrees that these patients can be raised as fertile females if the treatment can be started early in life [31].

This study has several limitations. This was a retrospective study and depended on patient-records. For this reason, many parameters, such as clinical presentations, examination findings and complete investigation profile could not be analyzed as these were not consistently and properly recorded. This was a tertiary level hospital-based study, so diseases prevailing in the community may not be reflected properly. There were also no follow ups. Nonetheless, this study gives us an insight of gynecological problems in the children prevailing in this region.

5. CONCLUSION

There are variations in the admitted and OPD patients with gynecological problems. Labial

adhesion was commonest among the OPD patients and trauma was the most common cause of admission. Fall from a height was the commonest cause of trauma. Leech bite in vagina was common throughout all the seasons in this tropical country. Ovarian dermoid and twisted ovarian cysts were common gynecological diseases and there was a high rate of cyst necrosis resulting from twisted ovarian cysts. About one fourth of the conditions were birth defects or developmental disorders. Acquired conditions were more in older age groups. Sexual assaults on the young girls were also prevalent. There are also other diverse conditions which are needed to be diagnosed and treated. More studies are needed from different institutes to find out different gynecological problems in children and treat them properly.

CONSENT

It is not applicable.

ETHICAL APPROVAL

The current study has guaranteed the confidentiality of patient data by expressly omitting names from the case record forms. The current study has collected and processed the data in absolute anonymity. This was a retrospective study and no experiment was performed in any patients and no subjects were contacted for purpose of the study. All authors declare that this study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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