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**RESEARCH ARTICLE**
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# STUDY ON EVALUATION OF CAUSES OF MENSTRUAL PROBLEMS IN ADOLESCENT GIRLS ATTENDING OPD IN TERTIARY CARE CENTRE

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## ABSTRACT

**BACKGROUND**: Menstruation is a natural biological process and an integral part of the female reproductive system, signifying a transition from girlhood to womanhood. Adolescent girls, typically aged between 10 and 19 years, often experience a variety of menstrual problems that can affect their physical, psychological, and social well-being

**METHODOLOGY:** This is a prospective observational study done at a tertiary care hospital-Government Maternity Hospital (GMH), Tirupati, Andhra Pradesh, India. 100 adolescent girls attending OPD were included in the study. Demographic details, medical & menstrual history were obtained in detail. They were examined. Blood samples collected and sent for investigations.

**RESULTS:** 12% of the study population suffering with thyroid abnormalities majority being hypothyroid.79% presented with normal USG findings. PCOS is the common abnormality that was observed. Most common etiological factor identified was anovulatory cycles. Comprehensive evaluation of adolescent girls experiencing menorrhagia at the earliest signs is very important to initiate effective treatment strategies and prevent the onset of anemia and its associated health issues.

**KEYWORDS**: Adolescent girls, Menorrhagia, Menstrual problems

## INTRODUCTION

Menstruation is a natural biological process and an integral part of the female reproductive system, signifying a transition from girlhood to womanhood. Adolescent girls, typically aged between 10 and 19 years, often experience a variety of menstrual problems that can affect their physical, psychological, and social well-being. Despite being a substantial segment of the population, these young individuals frequently encounter menstrual issues that go overlooked due to societal taboos, lack of awareness, and inadequate health services (1).The onset of menarche marks a critical period in an adolescent girl's life, not only symbolizing reproductive maturity but also bringing challenges that may include dysmenorrhea,

menorrhagia, amenorrhea, and oligomenorrhea, among others. Furthermore, psychological stress and environmental factors have been implicated in exacerbating menstrual irregularities(2).
Any deviation in functioning of hypothalamo pituitary ovarian axis or blockage in outflow tract causes menstrual dysfunction common being **Amenorrhea, d**efined as absence or cessation of menstruation which can be physiological ( prepuberty, pregnancy, lactation, menopause), pathological, primary ( defined as absence of menstruation by age of 15 years with normal development of secondary sexual charecteristics, or by the age of 13 years with absence of development of secondary sexual charecteristics), Secondary which can be physiological or pathological defined as absence of menstruation for 3 months or more or 3 or more cycles in a woman. **Hypomenorrhea** characterized by **r**egular monthly menstruation but scanty in amount. (cycle of < 4 days, less than 4 ml), **Oligomenorrhea** being **i**nfrequent menstruation occurring at an interval of more than 45 days, **Polymenorrhea-** Frequent menstruation occurring at an interval of less than 21 days or 4 episodes in a 90 days period, **Menorrhagia-** heavy or prolonged menstrual bleeding, regular monthly menstruation but excessive in amount or duration.(>80 ml ,>8 days), **Dysmenorrhea** defined as painful menstruation of sufficient magnitude so as to incapacitate day to day activities

**AIMS AND OBJECTIVES:** To evaluate the causes of menstrual problems in adolescent girls attending OPD at tertiary care centre and to identify the common cause of menstrual problems. To evaluate prevalence of anemia in puberty menorrhagia and common cause for it.

**MATERIALS AND METHODS:** It is a prospective observational study done for a period of one year done at Government Maternity Hospital, Tirupati, Andhra Pradesh, India. Target Population being Adolescent girls of age 10-19 years attending OPD in department of obstetrics and Gynaecology. Adolescent girls attending OPD at GMH Tirupati with menstrual problems who have given consent were included in the study. Pregnant women, women using OCP's, women of above 19 years were excluded from the study. A total of 100 adolescent girls were included in the study. Details of study protocol explained to subjects, informed consent is obtained, demographic details like name, age, marital status, parity, address and others were taken, detailed obstetric, menstrual, and medical history of each patient was taken, detailed history regarding menstrual history was taken, general physical examination, systemic examination, per abdominal examination, local examination are done, routine blood investigations were done special investigations were done. The data collected was entered into Microsoft excel spread sheet and an analysed using Epi info7. Descriptive data were presented in the form of frequencies percentages and standard deviation.. Based on whether the data is following parametric or non parametric distribution chi square test was used to compare various study outcome .p value <0.05 was considered as statistically significant otherwise not.

**OBSERVATION AND RESULTS**

Age distribution among study population being : 11-14 years, 15-17 years, and >17 years with respective frequencies and percentages of 15 (15%), 33 (33%), and 52 (52%)

**TABLE 1: DISTRIBUTION OF PARTICIPANTS BASED ON DURATIONFROM MENARCHE**

| DURATION FROM MENARCHE | NO OF CASES | PERCENTAGE |
|---|---|---|
| <6 MONTHS | 10 | 10% |
| 6MONTHS -1 YEAR | 26 | 26% |
| 1-2 YEARS | 20 | 20% |
| >2 YEARS | 44 | 44% |
| TOTAL | 100 | 100% |

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**TABLE2: DISTRIBUTION OF PATIENTS BASING ON VARIOUS COMPLAINTS AMONG STUDY POPULATION**

| Complaints | No of Cases | Percent |
|---|---|---|
| OLIGOMENORRHEA | 41 | 41 |
| MENORRHAGIA | 33 | 33 |
| DYSMENORRHEA | 21 | 21 |
| POLYMENORRHEA | 3 | 3 |
| POLYMENORRHAGIA | 1 | 1 |
| AMENORRHEA | 1 | 1 |
| Total | 100 | 100 |

**TABLE 3: VARIOUS ETIOLOGICAL FACTORS OF MENSTRUAL PROBLEMS**

| CAUSES | No of Cases | PERCENTAGE |
|---|---|---|
| ANOVULATORY CYCLES | 37 | 37% |
| PCOS | 9 | 9% |
| HYPOTHYROIDISM | 10 | 10% |
| HYPERTHYROIDISM | 2 | 2 % |
| COAGULATION DISORDERS | NIL | 0 % |
| OTHER CAUSES | 2 | 2% |
| NORMAL | 40 | 40% |
| TOTAL | 100 | 100% |

**Table 4 : HAEMOGLOBIN LEVELS AMONG STUDY POPULATION**

| Haemoglobin | Frequency | Percent |
|---|---|---|
| < 5 gm/dl | 2 | 2 |
| 5.1 - 7 gm/dl | 8 | 8 |
| 7.1 - 9 gm/dl | 15 | 15 |
| 9.1 - 11 gm/dl | 46 | 46 |
| > 11 gm/dl | 29 | 29 |
| Total | 100 | 100 |

**Table 5: THYROID PROFILE DISTRIBUTION AMONG STUDY POPULATION**

| Thyroid Profile | Frequency | Percent |
|---|---|---|
| Normal | 88 | 88 |
| Hypothyroid | 10 | 10 |
| Hyperthyroid | 2 | 2 |
| Total | 100 | 100 |

Thyroid profile distribution among adolescent showed that 88% of the population were normal followed by hypothyroid(10%) and hyperthyroid (2%) shown in above table.

**Table 6 : DISTRIBUTION OF STUDY POPULATION BASING ON ULTRASOUND PROFILE**

| Ultrasound finding | Frequency | Percentage |
|---|---|---|
| PCOS | 17 | 17 |
| ADENOMYOSIS | 1 | 1 |
| Cyst | 2 | 2 |
| THICKENED ENDOMETRIUM | 1 | 1 |
| Normal | 79 | 79 |
| Total | 100 | 100 |

Ultrasound profile showed that, 79% of the adolescent were normal, followed by PCOS 17%, and 1 adolescent was with Adenomyosis, 2 adolescent were with ovarian cyst, and 1 adolescent was with thickened endometrium as shown in above table.

**Table 7: DISTRIBUTION OF STUDY POPULATION BASED ON LH/FSH RATIO**

| LH/FSH Ratio | Frequency | Percent |
|---|---|---|
| ≥2 | 45 | 45 |
| < 2 | 55 | 55 |
| Total | 100 | 100 |

LH/FSH distribution showed that 55% of the adolescent were with ratio < 2 IU/liter and 45% were with ≥2IU/liter.

**Table 8 : DESCRIPTIVE STATISTICS AMONG STUDY POPULATION**

| Descriptive Statistics | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Age | 16.95 | 2.027 | 11 | 19 |
| Haemoglobin | 9.85 | 1.7997 | 3.4 | 13 |
| FSH | 4.611 | 1.7339 | 1.2 | 9.1 |
| LH | 10.602 | 8.3193 | 2.1 | 36 |
| LH/FSH | 2.329 | 1.5853 | 1 | 8 |

**Table 9 : ASSOCIATION BETWEEN ULTRASOUND PROFILE AND LH/FSH**

| Ultrasound | LH/FSH | | | Z-test | P-value |
|---|---|---|---|---|---|
| | ≥2 | < 2 | Total | | |
| PCOS | 14(31.1%) | 3(5.5%) | 17(5.5%) | 3.398 | 0.00068 |
| ADENOMYOSIS | 0(0%) | 1(1.8%) | 1(1.8%) | -0.9 | 0.36 |
| Cyst | 0(0%) | 2(3.6%) | 2(3.6%) | -1.29 | 0.197 |
| THICKENED ENDOMETRIUM | 0(0%) | 1(1.8%) | 1(1.8%) | -0.9 | 0.36 |
| Normal | 31(68.9%) | 48(87.3%) | 79(87.3%) | 6.51 | <0.0001 |
| Total | 45(100%) | 55(100%) | 100(100%) | | |

It was observed that, out of 17 adolescent with PCOS, 14 of them had LH/FSH ratio more than or equal to 2 and only 3 had less than 2. The association between PCOS and LH/FSH Ratio is statistically significant

DISCUSSION

This study titled "EVALUATION OF CAUSES OF MENSTRUAL PROBLEMS IN ADOLESCENT GIRLS ATTENDING OPD IN TERTIARY CARE CENTER" is a comprehensive inquiry into the myriad causes of menstrual irregularities among adolescent girls. This pivotal research, conducted at a tertiary care centre's outpatient department, aims to dissect the myriad factors contributing to menstrual health issues in this young population. Distribution of participants based on age and presentation from age of menarche: where older age groups are more likely to participate in studies The study by **Panda et al.**(2024) (3) in Odisha, India, also found that older adolescents (15–19 years) were more likely to participate in research related to menstrual health and hygiene. In a study conducted by **Prachi Koranne and colleagues**,(4) **50%** of girls experiencing puberty menorrhagia fell within the age group of **13–15 years**. Additionally, **62%** of these girls had the onset of menorrhagia **within 6 months of menarche**.

**THYROID DISORDERS IN ADOLESCENTS AND MENSTRUAL ABNORMALITIES:**

Thyroid disorders can significantly impact menstrual function in adolescents. menstruation and fertility due to hormonal changes or dysfunctional gonadotropin release. Adolescents with menstrual disorders should be evaluated for thyroid dysfunction as part of their workup.

Hyperthyroidism can lead to various menstrual problems, including irregular periods and lighter or fewer periods. The symptoms reported were, oligomenorrhea and dysmenorrhea, are consistent

with the effects of hyperthyroidism on the menstrual cycle as documented in medical literature(5). **Rajiwade et al (6)** identified thyroid dysfunction in 24 young individuals with irregular menstrual cycles(36). In a separate study focusing on women aged 20 to 45, those with intense hyperthyroidism showed a greater occurrence of secondary amenorrhea (**2.5%**) and light or infrequent menstruation (hypomenorrhea) at **3.7%**, compared to those with less severe hyperthyroidism, where the rates were **0.2%** and **0.9%**, respectively(7). **Ozgul et al** in their study found that prepubertal girls with subclinical hypothyroidism can have higher ovarian volumes which can be predisposed to cystic changes in future(8).

**PCOS IN ADOLESCENTS AND MENSTRUAL ABNORMALITIES:**

PCOS affects approximately 5% to 10% of females of reproductive age and often begins in the adolescent years(9). Criteria for diagnosis in adolescents may include irregular menstrual cycles, hyperandrogenism (evidenced by hirsutism or elevated androgen levels), and polycystic ovaries(10). PCOS can also lead to infertility due to anovulation (lack of ovulation)(11).

The **17% prevalence** of PCOS in this study is noteworthy, as it falls within the higher range of prevalence rates reported in adolescents, which can vary widely depending on the diagnostic criteria used. A large meta-analysis reports the prevalence of PCOS in adolescents to be **11.0%** using the Rotterdam criteria, **3.4%** using the NIH criteria, and **8.0%** using the Androgen Excess and PCOS Society criteria(11).Another source suggests that the prevalence of PCOS among adolescents is between **10.7% to 22.5%**(12), (13)

COAGULATION DISORDERS IN ADOLESCENTS AND MENSTRUAL ABNORMALITIES:

This study reported a **0% prevalence** of coagulation disorders as a cause of menstrual abnormalities in adolescents.

**Am J Hematol** found that menorrhagia is a valuable predictor for diagnosing coagulation disorders, it states that the prevalence of coagulation disorders may be substantially higher in women presenting with menorrhagia , vWD factor defiency was found to be 20% (14).

MENSTRUAL ABNORMALITIES IN ADOLESCENTS AND ANAEMIA

A study conducted in **rural Wardha, India**, found a high prevalence of anemia (80%) among adolescent girls, though most had only mild grade anemia(15). Another systematic review and meta-analysis reported that coagulation disorders, which can be associated with lower hemoglobin levels, were found in 19.4% of adolescents with heavy menstrual bleeding(16).It is also noted that adolescent girls with anemia have hemoglobin levels below the normal value limit, influenced by factors including socio- economic status and menstruation(17)

**LH/FSH RATIO**

Clinicians use the LH/FSH ratio to assess ovarian function and identify underlying hormonal imbalances. A study on the diagnosis and management of PCOS in adolescents suggests that an imbalance in LH/FSH ratio, often with a higher LH, is indicative of PCOS. Another study highlights that a basal LH to FSH ratio achieved less efficient predictive value with 71% sensitivity and 86% specificity in diagnosing central precocious puberty (CPP). It's also noted that the LH/FSH ratio is not a sex- dimorphic marker after infancy, and during puberty, the ratio is significantly higher in healthy females(18). Treatment for PCOS aids in the improved control of endocrine and biochemical parameters, notably decreasing hyperinsulinemia, insulin resistance, and the LH/FSH ratio(19). Longitudinal studies could provide more insight into how these ratios affect long- term health outcomes(18,20).

**DYSMENORRHEA IN ADOLESCENT**

A study conducted on current problems in pediatric and adolescent health care shows that 41% of young women are affected by dysmenorrhea. Most of adolescent suffering from dysmenorrhea has been reported with school absenteeism, low grades in school, poor performance. It is detrimental in all possible ways for the children suffering. As this study has significant number of cases with dysmenorrhea, it is essential to address this problem more seriously.

## SUMMARY OF THE STUDY

Menstrual abnormalities were the most common complaints among the adolescent girls who visited the gynaecological OPD. Oligomenorrhea is the most common presentation followed by menorrhagia, dysmenorrhea, polymenorrhea, polymenorrhagia and amenorrhea. Majority of patients shown normal clinical examination and investigations are within normal limits. on evaluation causes for menstrual abnormalities in adolescents include anovulatory cycles, PCOS, hypothyroidism, and other causes like adenomyosis and ovarian cysts. This study does not report any coagulation disorder as a cause. mild to moderate anaemia was also commonly observed in patients with menorrhagia as a presenting complaint.

Anovulatory cycles in the majority of patients are attributed to immaturity of the hypothalamo pituitary -ovarian axis. Ultrasound reported normal findings in the majority of patients, but PCOS was found to be common finding followed by ovarian cysts, thickened endometrium and adenomyosis.

## CONCLUSION

Menstrual issues are the most frequent cause for gynaecological outpatient visits among young girls. It's essential to properly assess these bleeding issues early on, rather than dismissing them as a normal part of growing up. Menorrhagia, in particular, can be a key indicator of hereditary bleeding disorders, including ITP, von Willebrand disease, and factor VIII deficiency, and should be promptly investigated. The rise in PCOS cases among young girls can be attributed to childhood obesity, inactive lifestyles, insufficient exercise, and the widespread consumption of fast food. This trend poses a significant challenge for gynaecologists in providing care. It's crucial to conduct a comprehensive evaluation of adolescent girls experiencing menorrhagia at the earliest signs, to initiate effective treatment strategies and prevent the onset of anemia and its associated health issues. Schools and colleges should regularly offer health education sessions to raise awareness about adolescent gynaecological issues, utilizing menstrual calendars as a tool. Encouraging a healthy diet, active lifestyle, and practices like yoga can play a vital role in promoting well-being among young girls and should be integrated into school health programs.

## LIMITATIONS OF THE STUDY:

1. With a sample size of 100, the study may not capture the full spectrum of menstrual health issues prevalent in the broader adolescent population. This size may limit the generalizability of the findings.
2. As a prospective observational study, it can establish associations but not causality. The findings may point to correlations between observed factors and menstrual problems without proving a direct cause-and-effect relationship.
3. The study's one-year duration may not be sufficient to observe long-term trends or the full impact of interventions on menstrual health outcomes.
4. Exclusion Criteria: By excluding pregnant women, and those using oral contraceptive pills (OCPs), the study may miss out on important data relevant to a wider age range and different health conditions that could affect menstrual health.
5. Relying on self-reported data from participants could introduce recall bias or inaccuracies in reporting symptoms and menstrual patterns.
6. The use of ultrasound and routine blood investigations are valuable, but the study may not account for all possible diagnostic tools or emerging technologies that could provide additional insights.
7. The study may not fully address the socio-cultural factors that influence menstrual health, such as stigma, access to sanitary products, and educational disparities.

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