Dr. Sangeereni M
Reader, Department of Obstetrics and Gynaecology, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

Dr. T Shanmugha Shanthini
Final Year Post Graduate, Department of Obstetrics and Gynaecology, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

Common disorders in adolescents with menstrual disturbances

Dr. Sangeereni M and Dr. T Shanmugha Shanthini

Abstract
Introduction: Adolescent period is considered crucial as they go through many physiological, biological changes. Menstrual disturbances seem to be very common among adolescents. Most common being due to the immature hypothalamo pituitary ovarian axis and anovulation due to that. The common disorders include amenorrhea, dysmenorrhea, premenstrual syndrome and abnormal uterine bleeding. Pathological gynecological problems are uncommon in this age group.
Objectives: A study of common disorders in adolescents with normal disturbances.
Methods: A randomised prospective study was conducted on the adolescent girls of age group 12-19 years attending Raja Muthiah Medical College Hospital, Outpatient Department. With menstrual disorders.
Results: In an incidental study conducted on 75 adolescent girls attended outpatient department. Oligomenorrhoea, dysmenorrhoea, secondary amenorrhoea, Abnormal uterine bleeding are found as common menstrual disturbances. On evaluating these patients, Polycystic Ovarian Syndrome, Obesity and to some extent hypothyroidism was found.
Conclusion: Proper understanding of normal and abnormal menstrual cycle is necessary to direct the patients towards appropriate investigations and management. This article deals with common disorders in adolescents with menstrual disturbances.

Keywords: Adolescent, amenorrhea, premenstrual syndrome, dysmenorrhea, abnormal uterine bleeding

Introduction

Adolescent is derived from latin word adolescence, meaning to grow to maturity and in wider sense includes physical, mental, social and emotional maturity. Adolescent girls make upto 20% of total population (Sheid and Turner). Puberty is a period during which secondary sexual characters develop and the capability of sexual reproduction is attained Chamberlain *et al*. [1] Various studies have focused on adolescent gynaecological problems, of all, menstrual irregularities were found to be the commonest (Go swamy *et al.*) Although menstrual irregularities were normal during early menarche period, pathological signs and conditions have to be diagnosed at proper time and needed treatment must be started [2].

Materials

Type of study – prospective observational study period of study – October 2018 – May 2020 place of study – department of Obstetrics and gynecology, Rajah Muthiah Medical College, Chidambaram.

Sample size: 75

Inclusion criteria
- All adolescent girls of age group 12-19 years attending RMMCH OPD
- Adherence to research regulations
- Informed consent obtained

Exclusion criteria
- Women of all other age groups
- Patients with congenital disorders
- Patients with coagulation disorders
- A known case of endocrine abnormalities

Corresponding Author:
Dr. T Shanmugha Shanthini
Final Year Post Graduate, Department of Obstetrics and Gynaecology, Rajah Muthiah Medical College, Annamalai University, Chidambaram, Tamil Nadu, India

Methods

All adolescent girls attending Rajah Muthiah Medical College Outpatient department are considered. Adolescent girls mostly are reluctant to confess these menstrual disturbances neither to the family not to the physicians. Effective history taking from an adolescent requires particular skills and sensitivities. Detailed history regarding their family, past medical history and menstrual history were taken, after getting informed written consent from the patient as well as their parents/guardians since majority of them are under minor age groups. Confidentiality is a primary ethical and professional duty for the doctors and a crucial issue in adolescent healthcare. A thorough clinical examination including height, weight, secondary sexual characters, general examination of breast, thyroid, cardiovascular, respiratory, central nervous system or any congenital anomalies were noted. Body mass index (BMI), general examination comprising thyroid examination, presence of hirsutism, done. External genitalia examined. Per abdominal examination done to rule out any mass. Per rectal and Bimanual examination done whenever indicated. Patients were subjected to various investigations like complete hemogram, coagulation profiles, hormonal assay, ultrasonography depending on diagnosis clinically.

Statistical Analysis

Normally distributed data are presented as an arithmetic mean and SD, otherwise as a median and range. The chi-square test and Fisher's exact test were used to analyse variables on a nominal scale. For the stepwise selection, we used a criterion for entry of a p-value <0.10 and for removal of a p-vallue >0.10. The significance level was set at 0.05.

Observation & Results

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, RMMGH, Chidambaram. The study included 75 participants who were adolescents and their mean age was 15.3 ± 1.9 years and ranged from 11 to 19 years. (Table 1) Almost half of them were between the age group of 14 and 17 years. (Table 2)

Table 1: Age description of the study population (n=75)

Minimum	Maximum	Mean	SD	Median	IQ Range
11	19	15.3	1.9	15	14, 17

Table 2: Age categorization of the cases

Age categories (years)	Frequency	Percentage
11	2	2.7
12	4	5.3
13	10	13.3
14	12	16.0
15	11	14.7
16	12	16.0
17	14	18.7
18	7	9.3
19	3	4.0
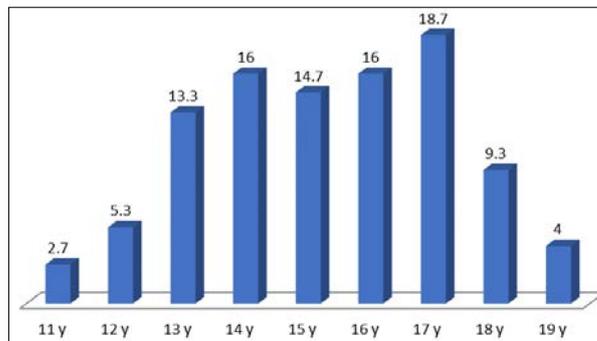
Graph 1: Age Groups (%)

Table 3: Stage of adolescence

Stage of adolescence	Frequency	Percentage
Early (11 to 14)	28	37.3
Mid (15 to 16)	23	30.7
Late (17 to 19)	24	32.0
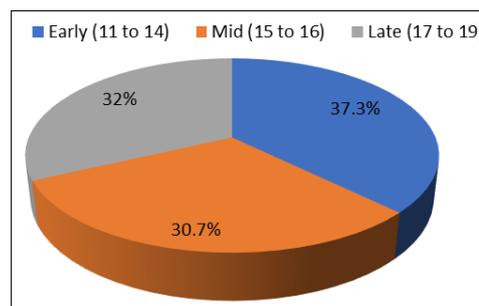
Graph 2: Stages of adolescence

The age has been categorized based on stage of adolescence and its distribution is shown in the above table and figure. Those who belonged to early adolescent stage were slightly higher (37.3%) followed by the late and mid-adolescent girls.

Table 4: Age at menarche

Minimum	Maximum	Mean	SD	Median	IQ Range
10	14	11.9	1.4	12	11, 13

The period at which menarche was attained has been detailed in the above table and it denotes the average age of onset of menarche was at 11.9 ± 1.4 years and ranged from 10 to 14 years.

Table 5: Socio-economic status

SES	Frequency	Percentage
Class III	35	46.7
Class IV	40	53.3

Girls who belonged to the class IV (lower middle) socio-economic status was observed to be the most common (53.3%) while those from middle class (class-III) contributed to 46.7% of the study population. (Table 5 and fig.)
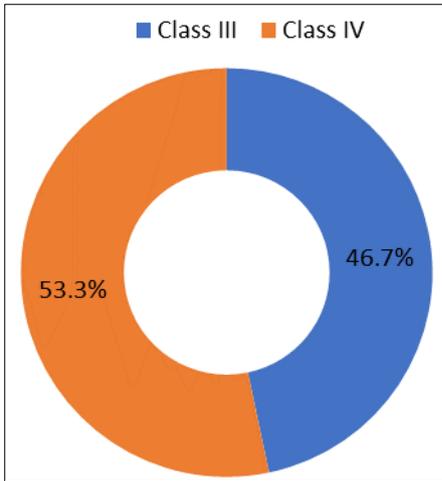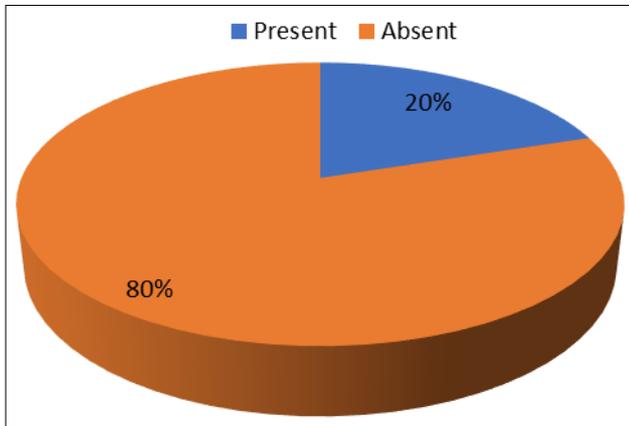
Graph 3: Socio-economic status

Table 16: Acne

Acne	Frequency	Percentage
Present	15	20
Absent	60	80

The prevalence of acne was observed and portrayed in table 11 (and fig), where nearly one-fifth (20%) were facing this cosmetic problem.
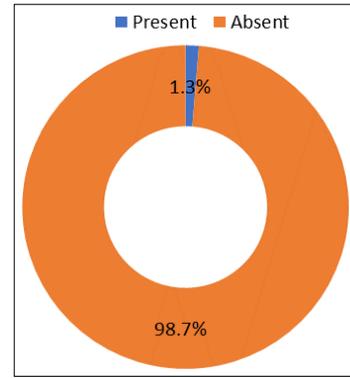

Graph 4: Acne

Table 7: Hirsutism

Hirsuitism	Frequency	Percentage
Present	1	1.3
Absent	74	98.7

The prevalence of hirsutism was very less and only one individual (1.3%) was affected with this problem. (Table 12 and Fig.)

**Graph 5:** Hirsuitism

Table 8: Hemoglobin (g%)

Minimum	Maximum	Mean	SD	Median	IQ Range
9	12.2	10.6	0.9	10.4	9.8, 11.4

The distribution of hemoglobin levels was displayed in the above table (and fig) and the mean value was observed to be 10.6 ± 0.9 gm% and the overall Hb level ranged from minimum of 9 gm% to a maximum of 12.2 gm%.

The grades of anemia as classified by WHO guidelines, was observed and represented in the following table (& fig). It shows that mild anemia was the most predominant grade (52.0%) noticed followed by the moderate grade (33.0%) while severely anemic girls were not found in this study group.
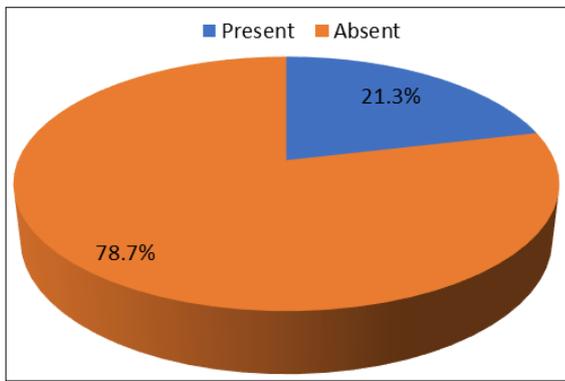
Table 9: Grades of anemia

Grades	Frequency	Percentage
Normal (Hb > 12.0g%)	11	14.7
Mild (Hb 10.0-11.9 g%)	39	52.0
Moderate (Hb 7.0-9.9 g%)	25	33.3
Severe (Hb < 7.0 g%)	0	0.0
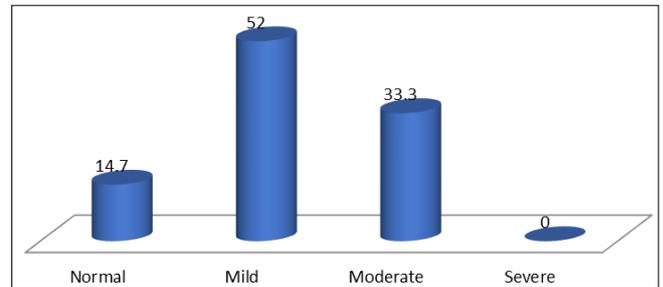
Graph 6: Grades of anemia (%)

Table 10: PCOS

| PCOS	Frequency	Percentage
Present	16	21.3
Absent	59	78.7

Graph 7: PCOS

The prevalence of PCOS among the adolescent girls was found to be 21.3% while rest of them (78.7%) were normal. (Table 19 and fig)

Table 11: Hypothyroidism

Hypothyroidism	Frequency	Percentage
Present	5	6.7
Absent	70	93.3

In table 20 (and fig), the distribution of persons diagnosed with hypothyroidism were only 6.7% whereas the majority (93.3%) were euthyroid.
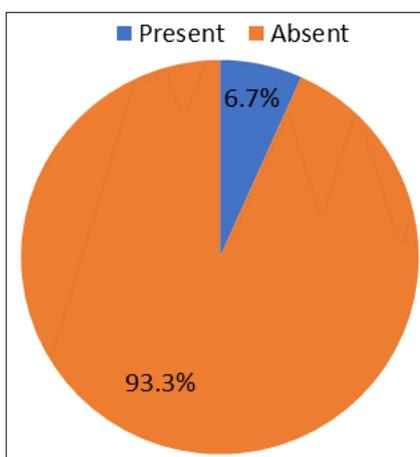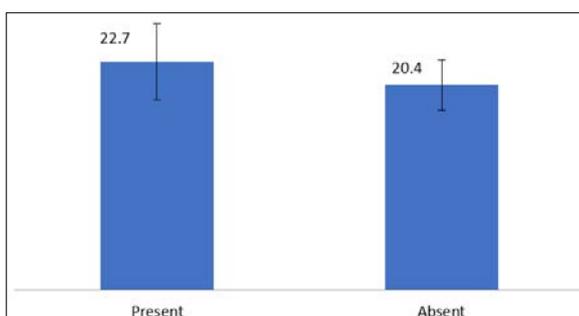

Graph 8: Hypothyroidism

Table 12: Relationship between PCOS and BMI (kg/m²)

| PCOS	Mean	SD	t-value	p-value
Present (n=16)	22.7	3.8	2.27	0.03
Absent (n=59)	20.4	2.5		
Independent t-test used; p-value <0.05 is significant;				

Graph 9: Relationship b/w PCOS and BMI (kg/m²)

The association between the PCOS and age at menarche was analyzed using appropriate statistical test and was shown in table 23 (& fig). The girls who were affected with PCOS have attained menarche slightly earlier (11.4 ± 1.2 years) than those who were free from disease (12.1 ± 1.4 years). This difference was found to be statistically significant. Independent t-test used ($P<0.05$).

Table 13: Relationship between PCOS and age at menarche (years)

PCOS	Mean	SD	t-value	p-value
Present (n=16)	11.4	1.2	2.02	**0.05**
Absent (n=59)	12.1	1.4		
Independent t-test used; p-value <0.05 is significant;				
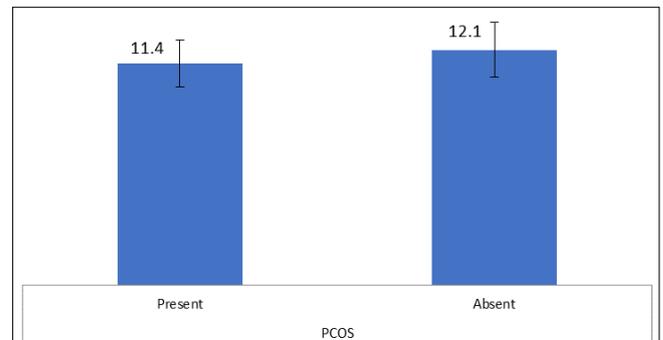
Graph 10: PCOS and age at menarche (years)

Discussion

Average age at menarche was found to be 12.2 years. Those who belonged to early adolescent stage were found to have higher (37.3%) rate of secondary amenorrhea, implying that immature hypothalamic pituitary ovarian axis is a common cause [3, 4]. Also, Oligomenorrhea was found common in girls who had PCOS, hyperandrogenism and hypothyroidism. Menstrual irregularities was a bit more common among the low socioeconomic group (53.3%) belonging to class IV. Mild anemia was prevalent among the study group (52.0%), which needed to be treated, to improve their school performance and physical well being. The overall BMI percentile ranged from minimum of 16.8kg/m², to a maximum of 27.1 kg/m², showing that, a part of the study group were overweight. Secondary amenorrhea and oligomenorrhea were the commoner menstrual irregularities [5-7]. The prevalence of PCOS and hyperandrogenism among the adolescent was found to be 21.3%. On applying statistical tests, it was evident that adolescents who were heavier (BMI = 22.7±3.8kg/m²) were more commonly associated with PCOS [8]. This difference was found to be statistically significant. Independent t-test used ($p<0.05$). On analysing the association between the PCOS and age at menarche, the girls who were affected with PCOS here attained menarche slightly earlier (11.4 ±1 year) than those who were normal(12.1 yrs). Acne was more prevalent among the girls who has PCOS (93.8%) and was found to be statistically significant ($p<0.05$, Pearson chi-square test).Higher proportion of girls with PCOS has had a positive association with hirsutism (6.2%). On analysis, it was observed that adolescent who were diagnosed to have hypothyroidism were found to be having shorter duration of flow (4 days) than the others [9-10].

Conclusion

To emphasize, menstrual irregularities are normal for 1-2 years following menarche due to immature hypothalamo pituitary

ovarian axis. If Menstrual irregularities persists, should be investigated for PCOS & hypothyroidism. Studies imply strong correlation between hyperandrogenism in PCOS with metabolic syndrome & cardiovascular problems in late of life. Hence it has to be treated. General awareness must be created to reduce the prevalence of anemia & obesity among adolescents with simple lifestyle modification and healthy balanced diet. These menstrual related problems will have reproductive morbidities and can affect future fertility. Thus screening adolescent for menstrual related problems will provide them with relevant information, counselling services and treatment options. Common endocrinological problems noted in adolescence with menstrual irregularities mainly belong to PCOS and hypothyroidism.

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