International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 10-04-2020; Accepted: 11-05-2020; Published: 21-05-2020
www.medicalsciencejournal.com
Volume 6; Issue 5; 2020; Page No. 52-54

Prevalence of polycystic ovarian syndrome in adolescent girls among a tertiary care hospital

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Abstract
Polycystic ovarian syndrome (PCOS) is a major health concern because patients with PCOS are at increased risk of infertility, pregnancy loss, obesity, cardiovascular disorders therefore early diagnosis and treatment is mandatory. But now a days the prevalence of PCOS among adolescents is an emerging problem that needs careful assessment, timely intervention, and appropriate treatment so our purpose of the study is to assess the prevalence of polycystic ovarian disease amongst adolescent girls. We conducted a prospective study in which 100 adolescent girls aged 15-19 years attending OPD with oligomenorrhea and/or hirsutism were advised for biochemical, hormonal, and ultrasonographic evaluation for diagnosis of PCOS on the basis of Rotterdam's criteria, at the Department of Obstetrics and Gynaecology, Government Doon Medical College Dehradun. We observed the prevalence of PCOD in adolescent is 14% most of them associated with menstrual abnormality. The prevalence of PCOS among adolescents is an emerging health problem that needs careful assessment, early diagnosis, timely intervention, and appropriate treatment.

Keywords: adolescent girls, polycystic ovarian syndrome, hirsutism, oligomenorrhea

1. Introduction
Polycystic ovarian syndrome (PCOS) is one of the most commonest and complex endocrinological disorder of reproductive age group with a broad spectrum of clinical manifestations affecting about 6-8% of women of reproductive age [1].
The prevalence of PCOD is in increasing trend in India as there are drastic modifications in lifestyle, adoption of sedentary habits and packed food intake leads to hormonal imbalances.
World Health Organization (WHO) estimates that it affected 116 million women worldwide in 2012 (3.4% of women). Globally, prevalence estimates of PCOS are highly variable, ranging from 2.2% to as high as 26% [2].
The key factors for the diagnosis of PCOS in adults are menstrual abnormality polycystic ovarian morphology and features of hyperandrogenism, but in cases of adolescent girls during the early stages of puberty tend to have anovulatory menstrual cycles, higher androgen levels, and polycystic ovaries. Thus, PCOS symptoms tend to overlap with normal pubertal changes [3, 4]. Because of these variations, the practice of using adult diagnostic criteria raises the concern for misdiagnosis in adolescent age group.

2. Methods
Present study is conducted in Gynaecology OPD of Government medical college Dehradun between October 2019 to November 2019. Total 100 adolescent girls included in the study. These adolescent girls aged 15 to19 years attending OPD with oligomenorrhea and/or hirsutism were advised for biochemical, hormonal, and ultrasonographic evaluation for diagnosis of PCOS on the basis of Rotterdam's criteria.

Inclusion criteria
Adolescents aged 15–19 years, not married, and had menarche more than 2 years before the study.

Exclusion criteria
Those who were married, known case of thyroid disorders, hyperprolactinemia, Cushing's syndrome, and who were not willing to participate, were excluded from this study.
Detailed history regarding menstrual problem included irregular cycles, menstrual pattern, menstrual loss, dysmenorrhoea and hirsutism/ androgen production assessment (skin problems, and hair distribution) was taken. General physical examination especially their height in meters and weight in kilograms for body mass index, waist and hip measurements in inches, their ratio, hirsutism in Ferriman Gallways scoring system, thyroid enlargement and any other abnormality was noted. Body mass index of up to23 was taken as normal, between 23 to 24.9 kg/m2 was taken as overweight, and more than 25 was considered as obese according to the WHO criteria. The girls who were confirmed as having polycysticovaries on ultrasound were then advisedserum FSH, LH, Prolactin, Testosterone and TSH. Obtained data entered in MS excel and calculated in frequencies.

3. Result
Amongst 100 adolescents girls majority of them were in late adolescence i.e. 72% whereas only 28% were in their early adolescence.(Table1) Ultrasound report revealed 14 girls (14%) polycystic ovaries, most of study population were their late adolescence.(Table2) Most of girls were non-obese in both PCOD and non PCOD groups i. e. 71.45 and 83.7% respectively. (Table3, Fig1)

Table 1: Age distribution

Age	Number(N=100)	Percentage
Early adolescent	28	28%
Late adolescent	72	72%

Table 2: USG finding in study population

Age	PCOD On USG	Normal on USG
Early adolescent	2(2%)	26(26%)
Late adolescent	12(12%)	60(60%)
Total	14(14%)	86(86%)

Table 3: Relation between BMI and PCOD

BMI	PCOD group (14)	Non PCOD group (86)
Non obese	10(71.4%)	72(83.7%)
Over weight	3(21.4%)	14(16.3%)
Obese	1(7.1%)	0
Total	14(100%)	86(100%)

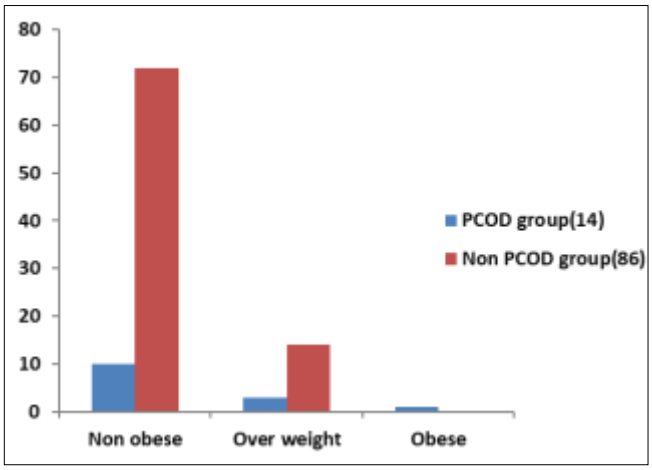

Fig 1: Shows relation between BMI and PCOS

Our study shows the irregular menstrual cycle is commonest clinical manifestation in both groups i.e. 92.8% and 93% respectively. Acne and hirsutism were second commonest clinical manifestation. Whereas loss of hair is more in Non PCOD group i.e. 50%. Obesity contributes 7.14% in PCOD groups and 3.48% in non PCOD groups. (Table3, Fig2)

Table 3: Clinical manifestations associated with PCOS and non PCOS groups

Symptoms	PCOD group N=14	Non PCOD group N=86	Total Percentage N=100
Irregular cycles	13(92.85%)	80(93.02%)	93%
Obesity	1(7.14%)	3(3.48%)	4%
Hirsutism	6(42.85%)	37(43.02%)	43%
Acne	9(64.28%)	52(60.46%)	61%
Loss of hair	5(35.71%)	43(50%)	48%
Mood change/depression	4(28.57%)	28(32.55%)	32%

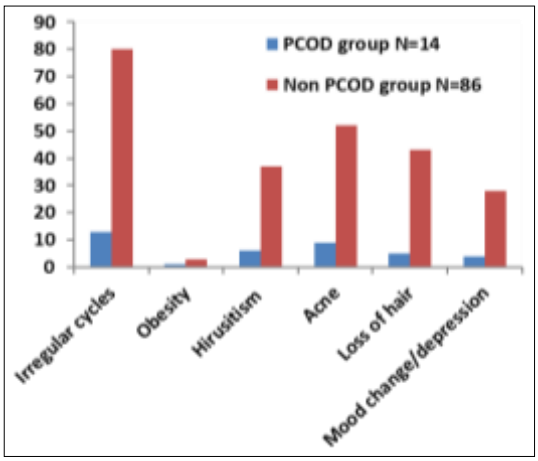

Fig 2: Clinical manifestations associated with PCOS and non PCOS groups

4. Discussion

The prevalence of PCOS among adolescents is an emerging health problem that needs careful assessment, timely intervention, and appropriate treatment. Exact prevalence of PCOD among adolescents not known as lack of data and document.

During this adolescent phase, which is a transitional period, several features may be in evolution and many findings may be transitory which stabilize later during adolescence. However, it is important to make an early diagnosis in order to prevent early and late sequel of polycystic ovarian syndrome. As It is well known that PCOS is a major health concern because it increased risk of infertility, pregnancy loss, obesity, cardiovascular disorders, diabetes mellitus, obstructive sleep apnea, depression, non-alcoholic fatty liver disease, endometrial hyperplasia and endometrial carcinoma [5, 9].

The study shows prevalence of PCOS is 14%. while another study done by Nidhi *et al*, which was community bases study the prevalence rate was 9.13% [10]. In another study conducted on Saudi girls, the estimated prevalence of PCOS was 53.7% which is strikingly high. Incidence of obesity in Saudi Arabia which has an established association with PCOS in this study [11].

Study shows PCOS is more common in late adolescent period (85.7%) it was similar as in Dr. Kalavathi *et al*, In that study about 76.2 % the cases were in late adolescence [12]. Among those diagnosed with PCOS, 71.4% were non-obese, 21.4% cases were overweight, and 7.1% were obese. According to Joshi B *et al* among those diagnosed with PCOS, 71.8% were nonobese, 7.5% cases were overweight, and 20.7% were obese [13].

Menstrual irregularity was the most common presentation in the adolescent includes both group both PCOS and non PCOS group. According to Maslyanskaya S, Talib HJ,at el, PCOS was the most common underlying etiology in adolescents hospitalized with abnormal uterine bleeding

(AUB) and menorrhagia [14].

5. Conclusion

PCOS is a major health concern because patients with PCOS are at increased risk of infertility, pregnancy loss, obesity, cardiovascular disorders. Diagnosis of PCOS in adolescence remains a major challenge because of overlapping of symptoms of PCOS with normal pubertal changes in adolescents and no separate criteria for making diagnosis. Hence, prevention, early detection and trearment of PCOS plays important role in prevention of complications.

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