Obstetrics and Gynecology

TO STUDY THE PREVALENCE OF POLYCYSTIC OVARY SYNDROME AMONG THE ADOLESCENT GIRLS ATTENDING TO TERTIARY CARE HOSPITAL

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ABSTRACT
BACKGROUND : Polycystic ovarian syndrome (PCOS) is one of the most common endocrinological disorders in women with a broad spectrum of clinical manifestations.
OBJECTIVE : To study the prevalence of polycystic ovary syndrome among the adolescent girls attending Tertiary Care Hospital.
MATERIALS & METHODS : This study was conducted in adolescent girls (10-19 years) during a time period of one year in the Postgraduate department of Obsterics & Gynaecology, Govt. Medical College, Jammu with effect from 01-11-2017 to 31-10-2018 . Data thus obtained was compiled and entered in spreadsheet (Microsoft Excel) and then analysed using SPSS version 20.0. Appropriate statistical methods were applied and p-value less than (0.005) was considered as significant.
RESULTS : A total of 1350 girls in age group of 10-19 years attended the hospital during one year period. Out of which 244 had features of PCOS. Majority of them (93.52%) were in the age group of 17-19 years. The prevalence was found to be 18.14%. Majority of them (66.8%) were with normal BMI.73.36% had irregular menstrual cycle and oligomenorrhoea.
CONCLUSIONS : There is a need for early diagnosis of PCOS in adolescent girls so that the symptomatology of the disease and long term complications of PCOS are prevented.

KEYWORDS : polycystic ovary, oligomenorrhoea, adolescent

INTRODUCTION

Polycystic ovary syndrome is one of the most common endocrine disorder among women of reproductive age group. It is defined as a hormonal disorder characterized by the presence of at least one polycystic ovary accompanied by ovulatory dysfunctions hyperandrogenism (Jalilian A et al, 2015)[1] with a broad spectrum of clinical manifestations affecting about 6-8% of women of reproductive years (Azziz R et al, 2005)[2].

The exact prevalence of the syndrome is not known as the syndrome is not defined precisely and there is lack of consensus on diagnostic criteria. Globally the prevalence of PCOS is highly variable 2.2 – 26% . In India the prevalence of PCOS is gradually increasing because of life style that people have adopted.The prevalence of PCOS in Indian adolescents is 9.13% as estimated by Katra P et al, 2009[3]. The determinants of polycystic ovarian syndrome have been linked to both hereditary and environmental factors. Although PCOS is a common disorder but the diagnosis may be overloaded during adolescence as irregular menses with anovulatory cycle, obesity and acne are frequent in adolescent women.

PCOS is a major health concern because patients with PCOS are at increased risk of infertility, pregnancy loss, obesity, cardiovascular disorder, diabetes mellitus, obstructive sleep apnea, depression and endometrial carcinoma[4,5,6,7,8]

Diagnosis of PCOS is difficult in adolescents because half of the menstrual cycles are anovulation in the first 2 years after menarche while USG display of multiple follicle is also fairly common in puberty.Thus biochemical hyperandrogenemia with hair excess are at present the main finding indicating diagnosis at this age.

An increased prevalence of PCOS is associated with a number of conditions like weight gain, epilepsy and anti epileptic drugs precedes the development of the clinical features of PCOS[9]. Excessive body weight amplifies the clinical severity of PCOS and increases the risk of several metabolic and cardiovascular complications associated with PCOS[10]. A number of factors which are associated with increased risk of PCOS have been identified in children[11]. Prenatal factors include high birth weight in girls born to overweight mothers, congenital virilization. Risk factors later in childhood include premature pubarche, atypical central precious puberty, obesity syndrome, Acanthisis nigricans and metabolic syndrome. A high index of suspicion for the diagnosis of PCOS is warranted in adolescent with

persistently irregular menses and these risk factors[12].

The main endocrine derangement responsible for the clinical manifestation is hyperandrogenemia and abnormal insulin response to glucose. Prevalence of insulin resistance in PCOS ranges from 50-70% independent of obesity. The effect of obesity on the insulin resistance is additive to that of PCOS[13]. Hyperinsulinemia produces a hyperandrogenic state by increasing androgen production by theca cells and by reducing hepatic production of sex hormone binding globulin resulting in hyperconcentrations of free androgens[14].

The present study was conducted to find out the prevalence of polycystic ovary syndrome (PCOS) among adolescent girls attending 'adolescent clinic' in department of Obstetrics & Gynaecology, Govt. Medical College, Jammu.

OBJECTIVE :

To determine the incidence of polycystic ovary syndrome (PCOS) among the adolescent girls attending tertiary care hospital.

Material & Methods :

The present study was conducted among adolescents girls (10-19 years) in the Post Graduate department of Obstetrics & Gynaecology, SMGS Hospital, Jammu with effect from 1st November 2017 to 31st October 2018. The study population comprised of adolescent girls attending the gynecology OPD (adolescent clinic). The inclusion criterion was all unmarried girls in the age group of 10-19 years

METHOD :

Detailed history about their age , onset of menarche, menstrual history (regularity, duration of menstrual cycles, number of cycles), past and present medical and surgical problems, family, history regarding diabetes, hypertension, obesity and menstrual disorders. General physical examination included height in metres, weight in kilograms, Body mass index, hirrutism by modified Ferriman-Gallway score (score of >= 8 is hirrutism), acne vulgaris, Acanthoses nigricans, Alopecia. The various investigations done were S. TSH, S.Prolactin, Blood Sugar fasting, Oral glucose tolerance test in high risk cases (family history of diabetes mellitus, hypertension, obesity). Total testosterone, S. FSH, S. LH, ultyrasonography.

Body mass index below 18.50 kg pm^2 was taken as underweight , between 18.50 – 24.99 kg/m^2 was taken as normal and BMI between 25-29.9 Kg/m^2 as obese according to WHO criteria, 2004.Menstrual

irregularity were defined a the presence of chronic amenorrhoea or usual cycle length of > 35 days with less than 8 menstrual bleedings in the past year. S. FSH: LH ratio of 1:3 was taken as raised and below this was considered normal.

Transabdominal pelvic ultrasound was done for the evaluation of ovaries. Polycystic ovaries were defined by the presence of 10 or more follicles with 2-9 mm diameter in at least one ovary.

Diagnosis of Polycystic ovary syndrome was made according to Rotterdam diagnostic criteria, 2003.

The data obtained at the end of the study was compiled and entered in a spreadsheet (Microsoft Excel) and then analysed using SPSS version 20.0. Descriptive statistics of data was obtained.

RESULTS

Total no. of adolescent girls who attended adolescent clinic during the study period was 1350 out of which 244 showed features of PCOS

Table 1: Distribution of patients according to age

Age (in years)	Number of patients	Percentage
13-14	25	10.25%
15-16	64	26.23%
17-18	96	39.34%
18-19	59	24.18%

Mean age was 17.00+ 1.74SD. Range was 13-19 years. Age wise distribution shows that majority (63.%%) of these girls were in age group 17-19 years

Table 2 : Symptoms and signs associated with PCOS among study population

Symptoms & Signs	Number	Percentage
Irregular cycles	179	73.36%
Overweight & obesity	114	46.72%
Hirsutism	83	34.02%
Alopecia	4	1.64%
Acne	47	19.26%
Acanthasis Nigricana	10	4.10%

Family history of diabetes mellitus was present in 18 (7.38%), hypertension in 56 (22.95%) and obesity in 86 (35.25%).Most of the adolescent girls (179; 73.36%) had irregular menstrual cycles. Hirsutism was present in 34.02% girls , proving it to be one of the common symptoms. Acne was seen in 19.26%, Acanthesis nigricana in 4.10% and alopecia in 1.64% of subjects. Majority of adolescent girls had normal BMI (163; 66.80%) while the rest were either overweight or obese (81; 33.20%)

Table 3: Distribution of patients according to elevated lab test

Variable	No. of patients	Percentage
Sr. Total testesterone > 25	48	19.67%
Sr. TSH > 4.0	54	22.13%
Sr. LH > 12.5	52	21.31%
Sr. FSH < 10.0	238	97.54%
Sr. Prolactin > 29.0	30	12.30%
BMI (Kg/m^2)	163	66.80%
<= 25.0	81	33.20%
> 25.0		
FBS (mg/dl)	242	99.18%
<= 100	2	0.82%
> 100		

Elevated Sr. Total testesterone was present in 19.67%, Sr. TSH in 22.13%, Sr. Prolactin in 12.30%, Sr. LH in 21.31%, Sr. FSH in 2.46% and LH:FSH (>2.18:1) on 11.3% subjects.

DISCUSSION

Polycystic ovary syndrome is the most common endocrine disorder affecting millions of reproductive aged women worldwide. It affects approximately 2% to 20% women of thus age group. It is one of the leading causes of poor fertility. It is a syndrome of heterogenous presentations, most controversial and least understood condition in the field of endocrinology till date.

India is the world's second largest densely populated country with diverse population. Major portion of this population is composed of adolescents, experiencing an increase in prevalence of PCOS. The sudden rise in prevalence is due to changing food habbits, lack of exercise, premature puberty, stress and depression.

So, PCOS among adolescent girls is an emerging problem that needs careful assessment, timely intervention and appropriate treatment.

The spectrum of PCOS phenotype is wide, this includes women with no evidence of clinical and biochemical hyperandrogenisim despite of dysfunctional polycystic ovaries. It is important to make an early diagnosis in order to prevent early and late sequelae of the syndrome. Hence the present study was conducted in the Post Graduate department of Obstetrics & Gynaecology, SMGS Hospital, Govt. Medical College, Jammu over a period of one year to know the prevalence of PCOS among adolescent girls . All adolescent girls who visited the hospital were included in the study. A detailed history and examination were recorded. In our study majority (93.5%) of the adolescent girls were in age group of 17-19 years with mean age of 17 $\pm$ 1.74 years. Almost similar results were shown by Shawna B et al; 2013[15].

Majority of subjects (66.53%) in our study had normal BMI (18.5-24.9 kg/m^2). Deswal R et al; 2014 [16] showed similar results BMI in their study was in a range of 18-25 kg/m^2 in majority of cases.

Most of the adolescent girls in our study (179; 73.36%) had irregular menstrual cycles and oligomenorrhoea studies conducted by Balaji et al; 2015 & Deswal et al; 2014 showed that menstrual irregularity and oligomenorrhoea (90.9%) were the most common symptoms presented by adolescent girls with PCOS, which was in accordance to our study.

In our study Hirsutism was present in 50 cases (20.49%), Acne in 47 (19.26%), Acanthosis nigricans in 10 (4.10%) and alopecia 4 (1.64%). In a study conducted by kumari S et al; 2015 27.45% cases hirsutism, 17.64% acne and 5.88% Alopecia. These results are comparable to our study.

Elevated serum TSH levels were found in 54 (22.13%) and serum total testosterone in 48 (19.67%) in our study. Study by Mitra P et al; 2016and Kumari S et al; 2015[18,19] showed that 25% cases of PCOS had thyroid disorder and 13.72% had elevated testosterone levels respectively, almost similar to our study.

In the present study we found that prevalence of PCOS was in adolescent girls was 18.14% (244 out of 1350). Study by Birader K D et al; 2015 showed a prevalence of 23.8%, Joshi B et al; 2014 (22.5%), Rashidi et al; 2014 (14.1%), March W A et al; 2010 (11.9%) Nidhi R et al; 2011 (9.13%) and Vost T et al; 2012 (22-26%)[20,21,22,23,24,25] almost similar to our study.

The underdiagnosis of this mostly silent diseases is of concern. Early detection and prevention of morbidities associated with PCOS among adolescent girls is of paramount importance.

CONCLUSION :

It is concluded that the prevalence of PCOS is gradually increasing in India due to changing lifestyle and dietary habits. The adolescent girls should be actively involved in outdoor activities with special emphasis to shun junk foods. Being the most common endocrine disorder, it warrants that we should focus our research not only on clinical management of PCOS but also on the awareness of its further consequences and knowledge to adopt the safe strategies for its prevention.

REFERENCES:
1. Jalilian A et al; 2015
2. Azziz R, Woods KS, Reyna R, Key JJ, Knochenhaves ES, Tildiz BO, The prevalence and features of of polycystic ovary syndrome in an unselected population, J clinendocr Metab 2004; 89(6): 2745-749
3. Katra P, Bansal B, Nag P, Singh JK, Gupta RK, Kumar S et al. Abdominal fat distribution and insulin resistance in Indian women with polycystic ovarian syndrome. Fertil Steril 2009; 91(4): 1437-440
4. Bohler H Jr, Moleshagundam S, Winters SJ. Adipose tissue and reproduction in women. Fertil Steril 2010; 94(3):795-825
5. Farrel K, Atoni MH. Insulin resistance obesity, inflammation and depression in polycystic ovary syndrome; bio behavioural mechanisms and interventions. Fertil Staril 2010; 94(5): 1565-574
6. Vgontzas AN, Legro RS, Bixler EO, Grayev A, Kales A, Chrousos GP. Polycystic ovary syndrome is associated with obstructive sleep apnea and day time sleepiness: Role of insulin resistance. J Clin EndeorMetab 2001; 86(2):517-20
7. Hardiman, Pillay OC, Ahomo W. Polycystic ovary syndrome and endometrial

carcinoma. Lancet 2003; 361 (9371): 1810-812

8. Giudice LC. Endometrium in PCOS. Implanation and predisposition to endocrine CA. Best Pract Res Clin Endocrnol Metab 2006; 20(2):235-44
9. Moran LJ, Hutchison SK, Norman RJ, Teedie HJ. Lifestyle changes in women with polycystic ovary syndrome Cochrane Database syst Rev. 2011; (7): CD 00 7506
10. Goodarzi MO, Dumeric DA, Chazenbalk G, Azziz R. Polycystic ovary syndrome: etiology, pathogenesis and diagnosis. Nat Rev Endocrnol 2011; 7(4):219-31
11. Resenfield RL. Clinical review: identifying children at risk for polycystic ovary syndrome. J. Clin Endocrinol Metab 2007; 92(3): 787-96
12. Niandri KF, Hoeger K, Diagnosis and treatment of polycystic ovarian syndrome in adolescents. Curr Opin Endocrmol Diabetes obes 2012; 19(6): 497-504
13. Dunaif A, Sega K R, Futterwit W, Dobrjansky A. Profound peripheral insulin resistance, independent of obesity in polycystic ovary syndrome. Diabetes 1989; 38(9): 1165-74
14. Abdallah (2007)
15. Shawna (2013)
16. Deswal R, Dang AS, Nanda S. Prevalence of polycystic ovarian syndrome in North Indian women. Ind J Heal well being 2014; 5(6): 742-44
17. Balaji S, Amadi C, Prasad S, Kasav JB, Upadhyay V, Singh AK et al. Urban Rural comparison of polycystic ovary syndrome burden among adolescent girls in a hospital setting in India. Bio Med Res Int 2015; Article ID 158951, 10 pages
18. Kumari S, Pankaj S, Choudhary D, Raghwendra K H, Kavita. Study of adolescent girls with menstrual irregularities for polycystic ovaries and insulin resistance. Evol J Med Dent Sci 2015; 4(32):5472-483
19. Mitra P, Guria S, Ghosh S, Chakraborty S, Subhraparna D, Chatterjee P et al. A preliminary study of clinical manifestations of polycystic ovary syndrome in Kolkata. Int J Res Dev Phar L Sci 2016; 5(2):2074-79
20. Kalavathi D Biradee, Dr. AmritaN, Shamenewadi. Descriptive study of PCOS in adolescent girls among a tertiary care hospital of Bangalore. Indian Journal of Basic applied Medical Research March 2015 Vol-4 P453-457
21. Joshi B, Mukherjee S, Patel A, Purandare A, Chauhan S, Vaidya R. A cross sectional study of polycystic ovary syndrome among adolescent and young girls in Mumbai, India. Ind J Endcor Metab 2014:18(3):317-24
22. Homeira Rashidi, Fahimeh Ramezani Tehrani, Mahnaz Bahri Khomani, Maryam Tahidi, Fereidoun Azizi. To what extent does the use of Ratterdam criteria affect the prevalence of PCOS. A community based study . European Journal of Obst & Gynae a& Reproductive Biology 174 (2014) 100-105
23. March WA, Moore VM, Wikon KJ, Phillips DI, Norman RJ, Davies MJ. Prevalence of polycystic ovary syndrome in a community sample done under contrasting diagnostic criteria. Hum Repro 2010; 25(2) 544-51
24. Nidhi R, Padmalatha V, Nagrathna R, Amritanshu R. Prevalence of polycystic ovarian syndrome in Indian adolescents. J Pediatr Gynecol 2011; 24(4): 223-27
25. Vos T, Flaxman AD, Naghavi M, Lozana R, Mich and C, Ezzati Metal. Years lived with disability for 1160 sequel of 289 diseases and injuries 1990-2010: a systemic analysis for the global burden of disease 2010, Lancet 2012; 380 (9859):2163-196