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Risk of Developing Polycystic Ovarian Syndrome-Adolescent Girls

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Abstract:

Background: *Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders in women of fertile age, affecting 5-10% of the female population .polycystic ovarian syndrome endocrine disturbance-affecting women during their reproductive years .The prevalence has been increasing in the adolescent population. In more than 40% of cases, PCOS is associated with obesity as well as impaired glucose tolerance, type 2 diabetes and the metabolic syndrome. In adult female patient, it is associated with an increased risk of endometrial cancer and is the most common identifiable cause of female infertility. While the pathophysiology of PCOS remains unclear, insulin resistance has been implicated as a major causative factor. In addition to this, several genes have been associated with this syndrome.1*

Objective: *To find out adolescent girls at risk of developing polycystic ovarian syndrome.*

Methodology: *A Non-experimental descriptive research design was adopted to find out adolescent girls at risk of developing polycystic ovarian disorder in selected school. Purposive sampling technique was used. The data was collected on the sample of 100 adolescent girls in month of May 2013. A self-structured questionnaire and rating scale was used to find out adolescent girls at risk. The data was gathered and analysed by using statistical technique such as mean, mean percentage, standard deviation and chi-square value.*

Result: *The study revealed that majority of girls i.e. 82% of girls to age group 13-15years and 12% at age 10-12year. Majority of girls i.e. 92% had normal menstrual cycle. Majority of girls i.e. 77% had mild hirsutism. Majority of girls' i.e 50% had underweight. Majority of girls i.e. 65% had low waist hip ratio. Majority of girls' i.e 86 % had normal blood pressure. Majority of girls i.e. 73% of adolescent girls without oligomenorrhea.*

Conclusion: *Out of 100 adolescent girls, 5% of girls are at risk of developing polycystic ovarian syndrome. 8% of girls were having high weight hip ratio and 1% of adolescent girls were overweight. These girls were having a risk of developing polycystic ovarian syndrome and there is no relation between oligomenorrhea and hirsutism.*

Keywords: ***Polycystic Ovarian Syndrome, Adolescent Girls, Hirsutism, Oligomenorrhea, Body markers***

Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders in women of fertile age, affecting 5-10% of the female population .polycystic ovarian syndrome endocrine disturbance-affecting women during their reproductive years .The prevalence has been increasing in the adolescent population. In more than 40% of cases, PCOS is associated with obesity as well as impaired glucose tolerance, type 2 diabetes and the metabolic syndrome. In adult female patient, it is associated with an increased risk of endometrial cancer and is the most common identifiable cause of female infertility. While the pathophysiology of PCOS remains unclear, insulin resistance has been implicated as a major causative factor. In addition to this, several genes have been associated with this syndrome.[1]

The aetiology of PCOS is largely unknown, even though the syndrome was first described in 1935 by Stein and Leventhal. Several etiological factors have been postulated, including genes involved in androgen and/or insulin actions, androgen programming in utero, as well as environmental factors. There is strong evidence that PCOS has a genetic background, which is supported by increased familiar occurrence and by twin studies. However, so far, no single gene defect has been identified and, therefore, PCOS is more likely to be a polygenetic disorder. Experimental animal models have demonstrated that prenatal exposure to androgens is associated with many of the features typical of PCOS, such as abnormal luteinizing hormone secretion,

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hyperandrogenism, anovulation, abdominal adiposity and insulin resistance in adult life. However, the clinical relevance of this hypothesis remains to be elucidated. Furthermore, it has been hypothesized that insulin resistance is a socioecological adaptation to behavioural changes in reproductive and lifestyle habits. Overweight and obesity are of particular importance for the development of PCOS.[2]

Growth charts need to be followed longitudinally with these girls. Often adolescents have had no prior history of obesity as a child but gain a significant amount of weight at an accelerated rate following menarche (Richardson, 2003).Manifestations of hyperandrogenism need to be explored. Areas to focus on include development of acne, hirsutism, balding, and voice changes (Markle, 2001).Family history as it relates to PCOS and diabetes must be explored. PCOS tends to cluster in families and to follow the trend of first-degree relatives, especially mothers and sisters of girls diagnosed with the condition. A family history of diabetes also tends to show up in adolescents with PCOS who are also overweight with insulin resistance and glucose intolerance. Presence of hirsutism, acne, loss of hair, deepening voice, and clitoromegaly are all physical signs indicating a hyper androgenic state. Acne alone does not indicate PCOS, but it is certainly a sign to look out for as part of the constellation of signs with which an adolescent may present.[3]

Adolescents with polycystic ovarian syndrome are at increased risk of developing health problems later on life. Furthermore, the physical signs of polycystic ovarian syndrome can be determinate to a teenage girl self-image. Early diagnosis common to treatment of polycystic ovarian syndrome in adolescent are essential in ensuring adulthood health to restoring self-esteem. Emotional and financial strains that could have been prevented if polycystic ovarian syndrome were diagnosed in the teenagers. Polycystic ovarian syndrome is a common disorder with an estimated prevalence of reproductive age. The prevalence has been increasing in the adolescent population. In more than 40% cases, polycystic ovarian syndrome is associated with obesity as well as impaired glucose tolerance, type 2 diabetes and the metabolic syndrome. In adult female patient it is associated with an increased risk of endometrial cancer and is the most common identifiable cause of female infertility.[4]

Objectives

- To assess the level of oligomenorrhea among adolescent girls.
- To assess the level of hirsutism among adolescent girls.
- To assess body markers among adolescent girls
- To establish relationship of oligomenorrhea with hirsutism among adolescent girls.

Rationale of the study

The early recognition and prompt treatment of polycystic ovarian syndrome in adolescents is important to prevent long-term sequellae. More research is necessary in order to find answers to many clinical and theoretical aspects of the syndrome .The polycystic ovarian syndrome (PCOS) often presents in adolescence with menstrual disorders, acne and hirsutism. The early diagnostic signs are not missed sometimes as ‘normal’ changes of adolescence, and the opportunity to save the teenager from the stigmata of the syndrome is missed. The finding that the metabolic syndrome is a possible long-term sequela of PCOS now presents a challenge to make an early diagnosis, educate patients regarding the importance of weight control and exercise, and treat accordingly both symptomatically and prophylactically.[1]

Methodology

Research approach: Quantitative research approach was adopted to find out adolescent girls at risk of developing polycystic ovarian syndrome in selected school, Hoshiarpur.

Research design: A Non-experimental descriptive research design was used to find out adolescent girls at risk of developing polycystic ovarian disorder in selected school, Hoshiarpur.

Independent variables: Independent variables were age ,age of menarche, family residence, family income, family history of menstrual irregularities, family history of hypertension, family history of diabetes, dietary habits, and any other existing medical condition.

Dependent variables: The dependent variables was risk of developing polycystic ovarian syndrome in adolescent girls.

Research Setting: The present study was conducted at Railway mandi school, Hoshiarpur, Punjab. Railway Mandi School was 2-3 kms away from Shri Guru Ram Das College of Nursing .This school is situated in hoshiarpur city. Total 2,000 girl students are studying in school till 2013. The primary reason for selecting this school was Researcher's convenience, familiarity and expected cooperation from authorities in getting permission and conducting the study

Target population: The target population for the present study was adolescent girls aged between 15 to 23 years, studying in selected school, Hoshiarpur.

Selection of sample and sample size: Non-probability purposive sampling technique was used to select sample of

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100 adolescent girls who met exclusion and inclusion criteria of the study.

Criteria for sample selection

Inclusion criteria

- Adolescent girls between age group of 15-23 years.
- Adolescent girls studying in selected school.
- Adolescent girls who were willing to participate in the study

Exclusion criteria

Adolescent girls who were not willing to participate in the study

Selection and development of tool: The tool was constructed to identify the adolescent girls at risk of developing polycystic ovarian syndrome. Extensive review of literature i.e. books, journals, expert opinion and investigators professional experience provide basis for construction of structured tool.

Description of tool:

Section-A

This section was designed to assess school student's (adolescent girls) background information regarding independent variable such as Age , Age of menarche, Family income ,Family history of menstrual irregularity, Place of resident, Family history of diabetes, Family history of other medical condition, Dietary habits etc.

Section-B

This section consists of tool to find out adolescents girls at risk of developing out polycystic ovarian syndrome.

(A) Questionnaire for level of oligomenorrhea
(B) Body markers assessment tool, which includes BMI, waist hip ratio and B.P measurements
(C) Ferryman gallway hirsutism scale to detect level of Hirsutism among adolescent girls

Criteria measure score: Score for assessing risk as follows:

Based on Hirsutism score were categorized as

Normal = 0-8
Mild hirsutism = 8-15
Moderate hirsutism =15-23
Severe hirsutism = 23-35

On the basis to assess level of oligomenorrhea if

1. Factor present= Normal menstrual cycle
2. Factors present =Mild oligomenorrhea
3. Factors present =Moderate oligomenorrhea
4. Factors present =Severe oligomenorrhea

Reliability of the tool: Reliability of tool was computed by Karl Pearson coefficient of correlation and spearman brown formula. The reliability of self-structured rating scale to assess risk was 0.8 and thus tool was reliable to conduct the study.

Data collection procedure: Data was collected after taking written permission from the Principal of Railway Mandi School. The Data collection procedure study was carried out in May 2013. The total sample consisted of 100 adolescents girls. Purposive sampling technique was used. The researcher firstly introduced herself to the subject and explain the purpose of gathering information written inform consent was taken from subject, directions where given and they were ensured that their responses would be kept confidential and would be used for a research purpose .the researcher spent 20-25 min with each subject for data collection.

Ethical considerations: Before commencing the task for data collection, formal permission was obtain from principal of Railway Mandi School. Written consent was taken from adolescent girls before gathering information and they were assured that their responses would be kept confidential and would be used for research purpose only.

Plan for data analysis: Analysis of data was done in accordance with the objective .it was done by using descriptive statistics and inferential statistics (e.g. calculating percentage, mean and chi square etc.) to find out adolescents girls at risk polycystic ovarian syndrome.

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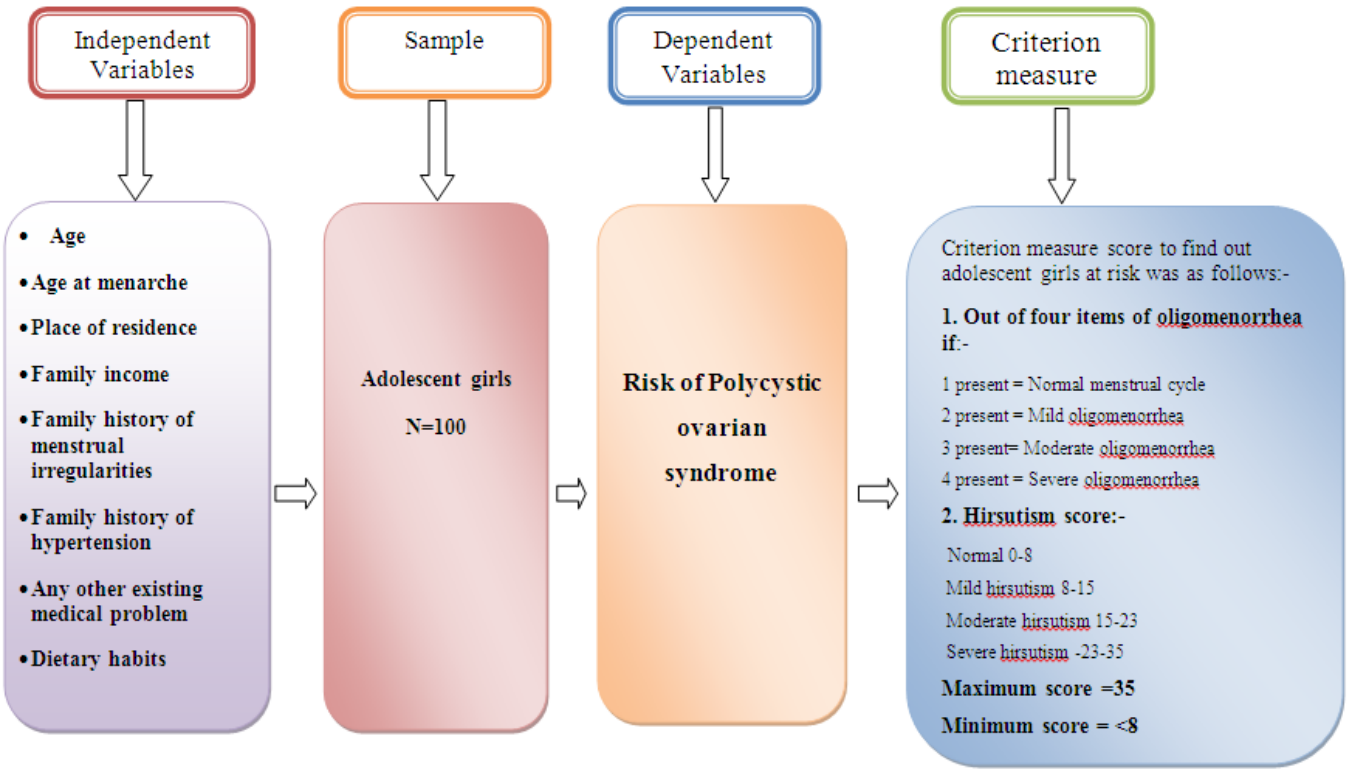

ANALYSIS AND INTERPRETATION

Table 1: Frequency and percentage distribution of adolescent girls according to their demographic characteristics

N=100

Sr. No	Demographic variables	N	% age
1	**Age (in years)**		
	a) 15-17	93	93
	b) 18-20	7	7
2	**Age at menarche (in years)**		
	a) 10-12	17	17
	b) 13-15	82	82
3	**Place of residence**		
	a) Rural	54	54
	b) Urban	46	46
4	**Family income (in Rs/month)**		
	a) <5,000	45	45
	b) 5000-10000	42	42
	c) >10,000	13	13
5	**Family history of menstrual irregularities**		
	a) Present	3	3
	b) Absent	97	97
6	**Family history of Hypertension**		
	a) Present	23	23
	b) Absent	77	77
7	**Family History of Diabetes**		
	a) Present	7	7
	b) Absent	93	93
8	**Any other existing medical condition**		
	a) Present	5	5
	b) Absent	95	95
9	**Dietary Habits**		
	a) Vegetarian	77	77
	b) Non- Vegetarian	23	23

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According to age, majority of adolescent girls i.e. 93 were in the age group of 15-17 years, seven adolescent girls were in the age group of 18-20 years and there is no adolescent girl comes in the age group of 21-22 years. According to age at menarche 17 of adolescent girls have menarche between age group of 10-12 years 82 adolescent girls have menarche at the age between 13-15 years and very few i.e. 1% of adolescent girls have menarche at age >15. According to place of residence, 54 adolescent girls resides in rural area, and 46 girls were living in urban area. According to family income, majority i.e. 45 adolescent girls have family income less than Rs 5000, 42 adolescent girls have family income between 5000-10000 and 13 adolescent girls have family income more than Rs 10000 per month. According to family history of menstrual irregularities, three adolescent girls have family history of irregularities and 97% adolescent girls have no family history of menstrual irregularities in family. According to family history of Hypertension, 23 adolescent girls have family history of Hypertension and majority i.e. 77 girls have no history of hypertension in their family. According to any other existing medical condition, five adolescent girls have history of medical condition in their family while 95 adolescent girls show no family history of medical condition. According to dietary habits, 77 adolescent girls were vegetarian and 23 girls were non-vegetarian.

Hence, it is concluded that majority of adolescent girls i.e 93% lies in age of 18-17 years, 82% have menarche between 13-15years, 54% resides in rural area, 45% have family income less than Rs 5000, have no history of oligomenorrhea, existing medical condition and 77% were vegetarian dietary habits.

Table no. 2(a): Percentage distribution of oligomenorrhea among adolescent girls
N=100

Sr. no	Level of menstrual irregularities	n	%age
1	Normal	92	92
2	Mild	5	5
3	Moderate	3	3
4	Severe	0	0

Table no-2 (a) shows that majority of adolescent girls i.e. 93% have normal menstrual cycle without oligomenorrhea, whereas, 5% of adolescent girls have mild oligomenorrhea and remaining 3 % of adolescent girls have moderate oligomenorrhea and no one having severe type of oligomenorrhea. Hence, it is concluded that majority of adolescent girls have normal pattern of menstrual cycle.

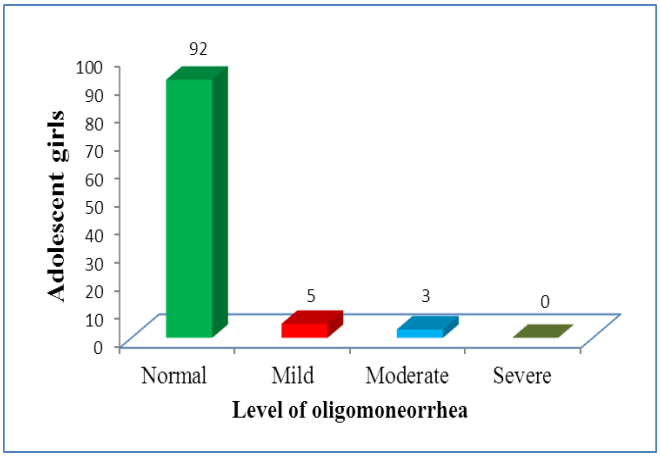

Fig. 2: Percentage distribution of oligomenorrhea among adolescent girls.

Table-2(b): Frequency distribution of hirsutism among adolescent girls

N= 100

Sr. no	Level of hirsutism	Criterion Measure	N	%age
1	Normal	0-8	0	0
2	Mild	8-15	77	77
3	Moderate	15-23	21	21
4	Severe	23-35	2	2

Maximum score = >35
Minimum score = <8

Table no-2 (b) show that distribution of hirsutism among adolescent girls i.e. 77% have mild hirsutism whereas, 21% of adolescent girls have moderate hirsutism where as 2% of adolescent girls have severe hirsutism and no one have normal category.

Hence, it is concluded that majority of adolescent girls have mild hirsutism.

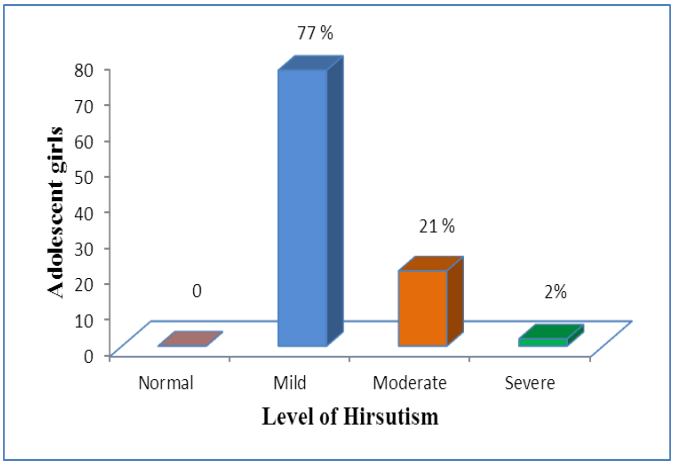

Fig.2: Frequency distribution of hirsutism among adolescent girls

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Table 2 (c): Frequency and mean distribution of adolescent girls according to body markers.

N = 100

Sr. No	Body markers	Criterion Measure	n	%age	Mean
1	**B.M.I**				
	a) Under weight	<18	50	50	16.64
	b) Normal	23	47	47	20.4
	c) Over weight	23-25	1	1	26
	d) Obese	>30	2	2	0.74
2	**Waist hip ratio**				
	a) Low	<0.75	65	65	0.70
	b) Normal	0.75-85	27	27	0.81
	c) High	0.85-0.90	8	8	0.89
3	**B.P**				
	a) Normal	120/80 mm of Hg	86	86	75
	b) Mild	140/90 mm of Hg	14	14	
	c) High	160/100 mm of Hg	0	0	
4	**Waist circumferance**		100	100	63.31

Table 2(c) depicts frequency distribution of adolescent girls according to their body marks. According to body mass index, majority i.e. 50% of adolescent girls were of underweight, 47% of adolescent girls were having normal BMI, 2 % of girls were obese and least i.e. 1% of adolescent girls comes under category of overweight or the mean score of BMI in adolescent girls are 16.64,20.4,26 respectively

According to waist hip ratio, majority of adolescent girls i.e. 65% were having low waist hip ratio while 27% of adolescent girls having normal waist hip ratio and least i.e. 8% of adolescent girls having high waist hip ratio and mean score of waist hip ratio of adolescent girls were 0.74, 0.81, and 0.89 respectively.

According to B.P Majority of adolescent girls have normal B.P while, 14 % of adolescent girls have mild elevation of systolic B.P and no girl come under high B.P category and mean score of B.P in adolescent girls is 130/75 respectively

Table- 2(d): Relationship between oligomenorrhea and hirsutism among adolescent girls

N = 100

Sr. No.	Level of Oligomenorrhea	Level of Hirsutism					d(f)	π^2
		n	Normal	Mild	Moderate	severe		
1	Normal	92	-	73	17	2		
2	Mild	5	-	4	1	-	2	0.70NS
3	Moderate	3	-	3	-	-		
4	Severe	0	-	-	-	-		

NS= Nothing significant
**= Significant at the level of P < 0.05 level*

Table 2 (d) depicts relationship between oligomenorrhea and hirsutism among adolescent girls. 92 adolescent girls were without oligomenorrhea and out of that 73 of adolescent girls have mild hirsutism, 17 adolescent girls have moderate hirsutism and 2 girls have severe hirsutism.

Out of 5 adolescent girls with mild oligomenorrhea i.e. 4 have mild hirsutism and least i.e. 1 have moderate hirsutism.

Out of 3 of adolescent girls with moderate menstrual irregularities, all girls have mild degree of hirsutism and no adolescent girl have severe degree of hirsutism and $\pi 2 = 0.70$.

So, it was concluded that majority of adolescent girls were normal without oligomenorrhea have mild hirsutism. Hence, it is concluded that there is no significant relationship between oligomenorrhea and hirsutism among adolescent girls.

Conclusion

The study revealed that Majority of girls i.e 92% had normal menstrual pattern. Majority of girls i.e 77% had mild hirsutism. Majority of girls i.e 50% had underweight. Majority of girls i.e 65% had low waist hip ratio. Majority of girls i.e 86% had normal blood pressure. Majority of girls i.e 73% of adolescent girls without menstrual irregularities.

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Implications

Nursing professional should render services according to the changes needs of society. The high incidence of PCOS in adolescent girls and morbidity rates associated with it to stress the need that nurses should educate the adolescent girls and promote knowledge of life style practices so that adolescent girls can prevent the PCOS and contribute their efforts in promotion of knowledge regarding PCOS. The study could guide the nurses for their active involvement in identification of adolescent girls having signs of polycystic ovarian syndrome.

Through publication of research findings, knowledge about risk of PCOS can be disseminated to make nurses more aware of PCOS in the area.

Recommendations

Based on the result following recommendations are made.

1. The study can be replicated on large sample in different areas to find prevalence of PCOD among girls and implement remedial measure for it.
2. A quasi-experimental study can be conducted to find the effectiveness of structured teaching programme regarding prevention of PCOS among adolescent girls.

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