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A CROSS-SECTIONAL STUDY OF WOMEN OF ASSAMESE COMMUNITY SUFFERING FROM POLYCYSTIC OVARIAN SYNDROME (PCOS)

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ABSTRACT

PCOS is one of the most common endocrinal disorders among women, affecting 5-10% of women at reproductive age (Franks, 1995). Some scientists are of the opinion that socio-cultural factors like food habit, lifestyle, rapid urbanization and modernization, shift from traditional occupation of agriculture, breakdown of the joint family structure and changing value system of the society may have some effect on PCOS. The total sample of Assamese experimental group is 172 whereas Assamese controlled group is 228. The present study is based on samples mainly drawn on opportunity sampling technique from the patients coming to the Pratiksha Hospital of Guwahati city for treatment of PCOS. Whenever patients are entered into roll of the Hospital as having PCOS are included in the sample. The present study reveals that this disease is not new but has been gained importance as more and more patients have been diagnosed as PCOS with the lapse of time. Biologically, it is concluded by other researcher that 'insulin resistance' is the main cause of this disease. Once the body become insulin resistant it becomes difficult to breakdown carbohydrate. Thus, deposition of fats as well as it is also difficult to lose the deposited fats. It is also seen in the present study that infertility is also one of the symptoms of PCOS and the Quality-of-life (QoL) of the PCOS populations is different in comparison to the controlled population.

KEYWORDS: Polycystic ovarian syndrome, Reproductive performance, Skinfold.

INTRODUCTION

Over the last few decades, traditional societies in many developing countries have experienced rapid and unplanned urbanization, which has led to lifestyles characterized by unhealthy nutrition, reduced physical activity and tobacco consumption (Reddy, 2001).These unhealthy lifestyles are associated with common modifiable risk factors for chronic diseases such as hypertension, diabetes mellitus, dyslipidaemia, and obesity (Murray et. al., 1996). Hence, lead to Polycystic Ovarian Syndrome. Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder affecting female fertility (Homburg, 1996; Kousta et al., 1999; Balen and Michelmore, 2002), originally described as early as 1935 (Stein and Leventhal, 1935, based on the observation of a set of symptoms such as amenorrhea, hirsutism and obesity in women whose ovaries were enlarged and contained multiple follicular cysts. It is a disorder in which women do not experience normal release of eggs from the ovaries (ovulation). And, since then the subject of extensive analyses, although its etiology and patho-physiology. They have an abnormal production of male hormones and their body is resistant to the effects of the hormone insulin. PCOS is a heterogeneous collection of signs, and symptoms that, when gathered together, form a spectrum of a disorder with a mild presentation in some, and a severe disturbance of reproductive life, endocrine and metabolic function in others. Key features include menstrual cycle disturbance, hyperandrogenism (hirsutism, acne and elevated serum testosterone concentration), and obesity.

SYMPTOMS OF PCOS

According to Natural health solutions for PCOS, Polycystic ovarian syndrome presents a complex and baffling array of symptoms. The condition is associated with some combination of the following symptoms that vary widely with each individual:

a. Multiple ovarian cysts

b. Irregular or absent menstrual cycle (Amenorrhea or Oligomenorrhea)

c. Infertility

d. Acne

e. Weight gain or inability to lose weight

f. Excess hair growth (Hirsutism)

g. Thinning of scalp hair

h. Velvety, Hyper-pigmented skin folds (Acanthosis nigricans)

i. High cholesterol (Hyperlipidemia) and high blood pressure (Hypertension)

j. Polycystic ovaries are 2-5 times larger than healthy ovaries.

k. Sleep apnea

l. Mood disorders, including anxiety and depression

m. Appetite disorder

n. Multiple hormone imbalances, commonly including: Androgens (testosterone), Estrogens, Follicle stimulating hormone (FSH), Insulin, Luteinizing hormone (LH), Progesterone, Prolactin (PRL), and Thyroid hormones (TSH).

OBJECTIVE OF THE PRESENT STUDY

a. Attempt to substantiate the common symptoms of polycystic ovarian syndrome.

b. To compare the reproductive performance of the experimental and controlled group.

c. To examine the anthropometric measurements of experimental and controlled group.

d. Study the level of depression and how it is related to the reproductive performance of the experimental group.

METHODOLOGY

This study is basically focused on women who suffered from PCOS and sought medical assistance for infertility at Pratiksha Hospital, Guwahati. The sample consists of cases of Assamese women who visited the IVF unit of 'Pratiksha', a hospital of Guwahati, Assam for treatment of infertility; they are referred to here as 'Experimental group'. The fieldwork was carried out during the period from February 2012 to May 2013. Women between 18 and 45 years of age have been included in the samples. The other sample of the same cultural group who are visitors to the hospital for various reasons having no serious illness, between 18-45 years of age who are not suffering from PCOS have also been drawn and are referred to here as 'Controlled group'. The sample of Assamese experimental group is of size 172 and Assamese controlled group is of size 228. The presence of polycystic ovaries was determined using the following criteria: the sonographic ultrasound (transvaginal) picture shows $\geq$ 10 cysts from 2mm to 10mm in diameter distributed evenly around the ovarian periphery with an increased amount of stoma (Adams et. al., 1985). The hormonal concentration of the experimental group is measured on the third day of the menstrual cycle, but the same of the controlled group could not be taken into account as there is no requirement of testing their hormonal concentration by the physician as well as it is too expensive to carried out by our self.

RESULTS

The body-mass index an anthropometric parameter have great impact on the PCOS women- although the cause-effect relationship has not yet been confirmed yet the findings suggest that PCOS women has tendency of getting overweight. The body mass index (BMI) is shown (Table 1). Majority of the women having PCOS belonging to the experimental group are in the category of overweight 47.67%. As regards the control groups, it reveal that majority of the respondents are in the category of normal BMI (77.63%).

Table-1: Body mass index of studied population

Population	Body Mass Index							
	Underweight		Normal		Overweight		Obese	
	No.	%	No.	%	No.	%	No.	%
Assamese experimental group	8	4.65%	70	40.70%	82	47.67%	12	6.98%
Assamese controlled group	6	2.63%	177	77.63%	45	19.74%	-	-

Symptoms of PCOS

In the Table 2 it is observed that maximum number of experimental women have irregular menstrual cycle 59.88%. In case of overweight as a symptom of PCOS, 54.65% Assamese women got affected by this. It may be observed that infertility as a symptom possess a threat to all the PCOS respondents (89.53%). Another major symptom is Dysmenorrhea, prevalence of this is highest among the Assamese PCOS women (77.90%). The other symptoms like hypothyroidism and hirsutism appears to be very minor in case of the respondents under study.

Table-2: Symptoms of PCOS of the studied population

Symptoms		Assamese women	
		No.	%
Infertility	Primary	154	89.53%
	Secondary	18	10.46%
Irregular menstruation		103	59.88%
Overweight and Obese		94	54.65%
Dysmenorrhea		134	77.90%
Hypothyroidism		15	8.72%
Hirsutism		3	1.74%
Total		172	

Reproductive measurements

The Table 3(a) reveals that the reproductive performance of the Assamese experimental group is very poor in comparison to the controlled group, which is self explanatory from the table below.

Table-3(a) Reproductive measurements of the studied population

Cultural category	No. of women who conceived	Total no. of conception	Mean conception	Live birth	Mean live birth	Miscarriages		Still birth		Total reproductive wastage	
						No.	%	No.	%	No.	%
Assamese experimental group	65	114	1.75	18	0.28	82	71.93	14	12.73	96	84.21
Assamese controlled group	228	433	1.90	368	0.85	52	12.00	13	03.00	65	15.01

Table-3 (b): Chi-square test of reproductive measurements between the experimental and controlled group

	X^2 value	Remarks
Assamese experimental group Vs Assamese controlled group	167.76	Significant

The Chi-square test was conducted to test whether there is any significant difference between the reproductive performances of the experimental and controlled group. The calculated value shows that reproductive performance of both experimental and controlled group differ vastly. This in other words means that higher the reproductive performance like, miscarriages, still births and for that matter the reproductive wastages, higher is the chances that the woman is suffering from PCOS. On the other hand higher the mean conception and mean birth, lower is the chances of suffering form PCOS.

Hormonal concentration

The hormonal concentration study constitutes an important segment in the study of infertility. The level of the three hormones name follicle-stimulating hormone (FSH), luteinizing hormone (LH) and prolactin (PRL) that are naturally produced by the pituitary gland indicates the fertility level of a woman. Table 4 shows the hormonal concentration of the experimental group. The mean LH concentration of Assamese experimental group is 7.93±5.07, FSH is 4.53±2.03 and PRL is 28.85±11.20.

It may be observed that mean FSH and mean LH hormones are less than the normal range and therefore it leads to a conclusion that there could be a decrease in the ovarian reserve. On the other hand the decreased level of LH also indicative of the fact that there is a possibility of anovulation, which results in infertility. This also shows an elevated mean prolactin value which led to the fall in follicle-stimulating hormone and luteinizing hormone causing infertility.

Table-4: Hormonal profile of the Assamese experimental group (taken on 3rd day of the menstrual cycle)

	Assamese experimental group
Hormones	**Mean± S.D.**
LH(mU/ml)	7.93±5.07
FSH(mU/ml)	4.53±2.03
PRL(ng/ml)	28.85±11.2

Anthropometric measurements

As regards the anthropometric parameters the findings show that except height, all other variables show a definite and distinguished trend separately for experimental and controlled groups (also shown by t-test). The trend shows that variable values are more in case of experimental group than the controlled group (Table 5).

Table-5: Anthropometric parameters of the studied population

	Assamese experimental group		Assamese controlled group		t-value
	Mean± S.E.	S.D.	Mean± S.E.	S.D.	
Height (in cm)	156.49±0.28	3.70	157.03±0.24	3.65	1.45 (Not significant)
Weight (in kg)	59.90±0.66	8.64	56.15±0.34	5.15	5.05 (Significant)
Abdominal skinfold	03.48±0.06	0.81	1.44±0.01	0.27	31.73 (Significant)
Suprailiac skinfold	03.35±0.05	0.65	1.22±0.02	0.28	40.25 (Significant)
Waist-hip ratio	00.87±0.004	0.06	0.75±0.001	0.03	24.06 (Significant)
Body mass index (in kg/m^2)	24.50±0.29	3.77	22.82±0.16	2.46	5.08 (Significant)

Level of depression

For this purpose we have used the 'Beck's Depression Inventory' questionnaire. This scale has 16 questions relating to the life of the PCOS sufferers and aims to assess the level of depression among them. Higher scores indicate greater level of depression. Range of the score is between 0 and 48. People who score between 0-10 is considered as normal; 11-21 as the presence of moderate level of depression and; 22 and above as severe level of depression.

Table-6: Level of depression of the experimental respondents according to their reproductive performance

		Normal		Moderate		Severe		Total	
		No.	%	No.	%	No.	%	No.	%
Assamese experimental group	Primary infertile	32	18.60%	64	37.21%	58	33.72%	154	89.5%
	Secondary infertile	14	8.14%	4	2.32%	-	-	18	10.46%
	Total	46		68		58		172	

The above table shows that in Assamese experimental group, majority of the respondents are suffering from moderate level of depression which constitutes 37.21 percent of the total respondents belonging to this category followed by the severe depression suffered by 33.72 percent of the women. Thus as much as 70.93 percent of the Assamese women having PCOS are the victims of moderate to severe depression. But in case of secondary infertile women, majority of them have normal level of depression.

CONCLUSION

The biological profiles of the respondents have been examined in terms of i) anthropometric parameters and ii) purely biological factors and an attempt

has also been made to substantiate the common symptoms of PCOS using the data.

As regards the anthropometric parameters the findings show that except height, all other variables show a definite and distinguished trend separately for experimental and controlled group. The trend shows that variable values are more in case of experimental group than the controlled group. The body mass index (BMI) of experimental group is analyzed and found that although the cause-effect relationship between the BMI and PCOS has not yet been established, yet the findings suggest that PCOS women has tendency of getting overweight. The study showed that maximum numbers of PCOS women of the experimental group fall in the category of overweight; while in case of non PCOS women, maximum numbers fall in the category of normal weight.

While examining the common symptoms among the PCOS sufferers, it has been found that majority of the respondents belonging to the experimental group have irregular menstrual cycle. In case of overweight as a symptom of PCOS, a more or less uniform trend is seen among majority of respondents. Thus overweight as manifested by the women in the experimental group can be accepted as symptom of the PCOS. Another major symptom associated with PCOS is dysmenorrhea. However the other symptoms like hypothyroidism and hirsutism appears to be very minor in case of the respondents under study and thus alone cannot determine the presence of PCOS in women.

The hormonal concentration of the PCOS women show that mean FSH and mean LH hormones are less than the normal range and therefore it leads to a conclusion that there could be a decrease in the ovarian reserve which indicates infertility. Thus we can conclude that hormonal profile of the women could indicate whether a woman is having PCOS or not.

A comparative analysis of the reproductive measurements of the experimental and controlled groups show that average conception of the PCOS women of the experimental group is quite negligible but the rate is much higher in case of controlled group. Similarly, the success rates are also much higher in case of non-PCOS women. The results of the Chi-square test show that the reproductive measurements of both experimental and controlled group differ vastly. From this, it can be inferred that higher the reproductive measurement like, miscarriages, still births and for that matter the reproductive wastages, higher is the chances that the woman is suffering from PCOS.

The Quality-of-life (QoL) of the PCOS populations is different in comparison to the controlled population. They are sufferers both mentally and physically. The pressure of family as well as of the society to have children makes them mental sufferer. In the present study, it is found that all the PCOS sufferers always have to face critical queries about this disease from their neighbours, relatives, co-workers and acquaintances. They become highly depressed because of the combined effects of all three factors- their weight gain, infertility problem and irregular menstruation.

This indeed is not a new disease but has been gained importance as more and more patients have been diagnosed as PCOS with the lapse of time. Biologically, it is concluded by other researcher that 'insulin resistance' is the main cause of this disease. Once the body become insulin resistant it becomes difficult to breakdown carbohydrate. Thus, deposition of fats as well as it is also difficult to lose the deposited fats.

It is also seen in the present study that infertility is also one of the symptoms of PCOS. Those who are overweight and obese, they can enhance their fertility and their chances of having healthy baby by losing weight. That is why weight reduction should be the first line treatment for the obese infertile women. This needs a multidisciplinary approach to weight management that fosters lifestyle change through proper diet, exercise, behavior modification and stress reduction. The tragedy, of course, is that this is easy advise to dispense- but very hard to do in real life. No one wants to be obese and losing weight can be really hard to accomplish but there is always a hope.

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