



International Journal of Current Research and Academic Review

ISSN: 2347-3215 Volume 2 Number 9 (September-2014) pp. 181-186

www.ijcrar.com



Epidemiological correlates among women with Polycystic ovary syndrome in South India

Pratik Kumar Chatterjee¹, P.Prasanna Mithra^{2*}, Rahul Pal³, Poulomi Chatterjee⁴, B.Unnikrishnan², N.A.Vinodini¹, Aparna Tripathi⁵, V.B.Suman¹, Anish Singhal¹ and Sheila R. Pai¹

¹Department of Physiology, ²Department of Community Medicine, ³MBBS Student, Kasturba Medical College (KMC), Mangalore, Manipal University (MU), Karnataka, India

⁴Dietician, formerly attached to Manipal Ecron Acu-Nova KH Clinical Research Centre, Manipal, Karnataka, India

⁵Department of Physiology, Melaka Manipal Medical College (MMMC), Manipal University (MU), Manipal, Karnataka, India

Corresponding author

KEYWORDS

Polycystic Ovary Syndrome, Blood group, Diabetes, BMI

A B S T R A C T

The present study aimed to find out the epidemiological correlates among women with PCOS in South India. 100 patients diagnosed with PCOS, between (18-40) years, were selected. A standard PCOS questionnaire was given & relevant data was collected. Patients were grouped according to their blood groups along with their age & BMI. Diabetes & family history were also considered ($p \leq 0.05$ significant). In this study showed that, majority of the females diagnosed of PCOS were between (21-30) years with an increasing trend being observed between BMI & ageing. Our data revealed that among the females belonging to O+ blood group, 57.7% ($p \leq 0.05$) were overweight/obese (taken together). Also, 40% of the patients included in the study group were diagnosed cases of diabetes & 28% of females had family history of PCOS. Therefore the present study suggests that majority of O+ females diagnosed of PCOS, were obese/overweight. Also an increasing trend of BMI with ageing was observed. Diabetes & family history of PCOS were additive factors. So, early screening of O+ females in South India, between the age group of (21-30) years could be useful for early diagnosis of PCOS, which might help for better management & prevention of further complications.

Introduction

Polycystic ovary syndrome (PCOS), a complex heterogeneous endocrine disorder (Legro RS, 2002) is the most common cause

of anovulation in women even with normal levels of serum follicle stimulating hormone (FSH) & estradiol (Bushra et al., 2013). This condition was first described in the year

1935, by American gynecologists Irving F. Stein, Sr. & Michael L. Leventhal & hence was originally named after them as Stein-Leventhal Syndrome (Azziz, 2006). PCOS - a marker of metabolic syndrome has been known to be associated with various conditions like, ovulatory dysfunctions, type II diabetes, hypertension, cardiovascular diseases, etc., (Aziz, 2006). There is emerging evidence that women with PCOS have an increased risk of being overweight & obese and also have a higher tendency of longitudinal weight gain (Moran, 2013).

Review of Literature

Polycystic ovary syndrome (PCOS) is one of the most common syndromes in women during their reproductive age. Though the most common features usually include excessive weight gain, oligomenorrhea/amenorrhea, increased triglyceride & insulin levels in the blood, acne, hirsutism, hypermenorrhea, etc., it is also associated with menstrual disorders & infertility usually occurring due to chronic anovulation (Teede et al., 2010; Christine et al., 2006). Though the exact cause of PCOS is unknown, evidence suggests that it's a genetic disease (Diedrich et al., 2011). A recent study has proposed that there is an increased prevalence of overweight/ obesity in women with PCOS. Also, a bidirectional interaction between PCOS & weight exists, i.e., PCOS causing weight gain and weight gain leading to an increase in the prevalence & severity of PCOS (Moran et al., 2013). Body mass index (BMI), also known as Quetelet index, is a measure of relative weight based on an individual's mass & height. It was formulated by the Belgian polymath Adolphe Quetelet, between 1830 and 1850. BMI is therefore defined as the individual's body mass divided by the square of his/her height, with the unit universally

being given in kg/m² (Eknoyan et al., 2007). It's well known that PCOS is independently associated with BMI. Though this might be due to a higher energy intake sedentary lifestyle observed in females suffering from PCOS, research has shown that elevated adiposity in PCOS is most probably not related to adverse lifestyle behaviours (Moran et al., 2013). It is possible that women with PCOS have a greater tendency to elevated adiposity due to intrinsic hormonal aberrations, including insulin resistance and hyperandrogenism (Pasquali et al., 2006).

Till date, no relevant study has been done to find out whether any link exists between PCOS & blood group with various other associated factors, like BMI, age-group, diabetes & family history. So, the present study was designed to find out the epidemiological correlates among women with PCOS, between the age-group of (18-40) years, in South India.

Experimental

Study design & setting: This is a hospital based cross sectional study which is, being conducted for a duration of one year & is based on the data obtained from the patients of Kasturba Medical College Hospitals & Government Lady Goshen Hospital, Mangalore, Karnataka, India. The Human Institutional Ethics Committee of Kasturba Medical College (KMC), Mangalore, Manipal University (MU), Karnataka, India approved the study protocol. Each patient was explained the purpose, procedures & confidentiality of this study at orientation & then a written informed consent was obtained from each participant.

Inclusion criteria: The study incorporated patients between the age group of (18-40) years, diagnosed of PCOS.

Exclusion criteria: Patients diagnosed of suffering from any chronic illnesses (except diabetes mellitus) & those who had submitted incomplete questionnaire data were not included in the study (ten women were excluded on this basis, leaving 100 patients eligible for the study).

Method of study: The study involved 100 patients, diagnosed with PCOS, between the age group of (18-40) years, from our hospitals. A PCOS questionnaire was handed over to the patients & data was recorded in the proforma for each patient (PCOS Questionnaire: info@nutritionspecialists.com, The Rotterdam ESHRE/ASRM - sponsored PCOS consensus

workshop group2003). Patients were grouped according to their blood groups along with their age & BMI. Overweight & obesity defined as per the World Health Organization/WHO 2000 criteria, i.e., overweight/pre-obese when BMI= (25-30) kg/m² & obese when BMI≥30 kg/m² (Moran et al., 2013). Diabetes & family history were also considered. A correlative analysis of the data was then be made accordingly.

Statistical analysis: Parameters were analyzed using Chi-square test. p ≤ 0.05 was considered as significant.

Table.1 Demographic & morbidity profile of the study population (n=100)

Characteristics		No. (%)
Age group (years)	<20	36 (36.0)
	(21-30)	42 (42.0)
	(31-40)	22 (22.0)
BMI classification	Normal	52 (52.0)
	Overweight	32 (32.0)
	Obese	16 (16.0)

Table.2 Association between BMI & blood groups among the subjects (n=100)

Characteristics		BMI classification			p value
		Normal No. (%)	Overweight & Obese No. (%)	Total No. (%)	
Blood group	A+	08 (57.1)	06 (42.9)	14 (12.5)	0.017*
	B+	14 (53.8)	12 (46.2)	26 (25.0)	
	AB+	08 (100)	00 (00.0)	08 (52.0)	
	O+	22 (42.3)	30 (57.7)*	52 (52.0)	
Total		52 (52.0)	48 (48.0)	100	

* p ≤ 0.05 → significant

Table.3 Association between BMI and age groups among the subjects (n=100)

Characteristics		BMI classification			p value
		Normal No. (%)	Overweight & Obese No. (%)	Total No. (%)	
Age group (years)	<20	58.3	41.7	36.0	0.598
	(21-30)	50.0	50.0	42.0	
	(31-40)	45.5	54.5	22.0	
Total	52 (52.0)	48 (48.0)	100		

Result and Discussion

Table 1 depicts an outline of the demographic & morbidity profile of the study population, which included a total of hundred patients (n=100), diagnosed of PCOS. Though majority (42%) of them were in the age-group of (21-30) years, about 48% of the patients included in this study population were found to be in the overweight/obese category, taken together.

An association between BMI & blood groups among the patients (n=100) is represented in Table 2. As observed, overall 48% of the females diagnosed of PCOS were overweight/obese but the percentage of overweight & obese (taken together) was highest (57.7%) among the patients belonging to O+ blood group. The difference across the groups was found to be statistically significant ($p \leq 0.05$).

Table 3 describes the association between BMI & age groups among the subjects (n=100).

Majority (42%) of them were in the age-group of (21-30) years. Though about 50% of the patients in this group were overweight/obese (taken together), the difference across the groups was not found to be statistically significant. Moreover, an increasing trend of BMI with ageing was observed.

Our data also revealed that 40% of the patients included in the study group were diagnosed cases of diabetes & 28% of the females had family history of PCOS.

The prevalence of different blood types among a group of persons studied showed that approximately 47% & 41% of the people were from 'O' & 'A' blood groups respectively followed by 9% from 'B'. Only 3% of them belonged to 'AB' blood group. About 85% of all white people & 95% of American blacks were Rh+ (Gyton & Hall, 2006). But, literature reveals that about 39% of the Indian population belongs to blood group 'B', followed by blood group O (31%) & A (21%). Only about 9.0% of the Indian population belongs to blood group AB. About 95% of these people are Rh+ & 5% are Rh- . Studies have shown that that blood group substances play a major role in the causation of diseases (Ghai CL, 2013) Polycystic ovary syndrome (PCOS) affects approximately (5-10) % of the Indian female population (Nidhi et al., 2011). Though previous report has shown that PCOS may occur at an younger age in girls who develop early pubarche & thelarche (Bronstein et al., 2011), our study revealed that majority of the females diagnosed of PCOS were in the age-group of (21-30) years & a large number of them were found to be in

overweight/obese. Study conducted has shown that the prevalence rates of PCOS are rising in countries, where obesity & type II diabetes are more common (Allahbadia et al., 2008). It is well known that in India, females with blood group O+ have the highest risk of developing PCOS, followed by women of blood group B+ & Rh negative individuals didn't show any association with PCOS (Rahul et al., 2014). Our data are also in accordance with previous studies which show that the among the PCOS patients, percentage of overweight & obese was highest in O+ blood group. It is well established that there is an increase in body weight & BMI with age & decline with advanced age, i.e., after 50 years (Kapoor, 2002). About (35-65)% of PCOS patients are obese, i.e., obesity, overweight & elevated BMI are the most common associated clinical features of this condition (Al. Agemi et al., 2004). The present findings reveal an increasing trend of BMI with ageing with diabetes & family history of PCOS being additive factors.

References

Al. Agemi M, Omv FE, Omu AE. The effect of obesity on the outcome of infertility management in women with Polycystic Ovary Syndrome. *Archives of Gynecology & Obstetrics*. 2004; 270: 209-210

Allahbadia GN, Merchant R. Polycystic Ovary Syndrome in the Indian Subcontinent. *Seminars in Reproductive Medicine*. 2008; 26(1): 22-34

Azziz R. Diagnosis of Polycystic Ovarian Syndrome: The Rotterdam Criteria Are Premature". *Journal of Clinical Endocrinology & Metabolism*. 2006;91(3):781-85

Aziz R. How prevalent is metabolic syndrome in women with polycystic

ovary syndrome? *National Clinical Practice Endocrinology Metabolism*. 2006; 22: 465-470

- Bronstein J, Tawelekars, Liv Y, PaweKzak M, David R, Shah B. Age of onset of Polycystic Ovary Syndrome in girls may be earlier than previously thought. *J Pediatr Adolesc Gynecol*. 2011; 24(1): 15-20
- BushraFiza, RatiMathur, PushpendraSaraswat. PCOS - correlation amongst Serum levels of Testosterone, Anti-Mullerian Hormone & Other Sex Hormones. *International Journal of Biological & Medical Research*. 2013; 4(3): 3290-3293
- Christine Cortet Rudelli, Didier Dewailly. Diagnosis of Hyperandrogenism in Female Adolescents. Hyperandrogenism in Adolescent Girls. *Armenian Health Network, Health.am* 2006
- Diedrich K, Bouchard P, Dominguez F, Matzuk M, Franks S. HamamahS. et al.. Contemporary genetic technologies and female reproduction. *Human Reproduction Update*. 2011; 17 (6): 829-47
- Eknoyan, Garabed (2007). "Adolphe Quetelet (1796–1874) - the average man and indices of obesity". *Nephrology Dialysis Transplantation* 23 (1): 47-51.
- Ghai CL. *Textbook of practical physiology*. 8th ed. New Delhi: Jaypee Brothers. 2013; 107-108
- Gyton & Hall. *Textbook of Medical Physiology*. 11th ed. Philadelphia, Pennsylvania: Saunders. 2006; 452-453
- Kapoor S & Tyagi S. Fatness, fat patterns & changing body dimensions with age in adult males of a high altitude population, in *Science of Man in the Service of Man*, M K Bhasin & S.L. Malik, Eds., 2002; 8: 129-136

- Legro RS, Strauss JF. Molecular progress in infertility: polycystic ovary syndrome. *Fertility and Sterility*. 2002; 78(3): 569-76
- Moran LJ, Ranasinha S, Zoungas S, McNaughton SA, Brown WJ, Teede HJ. The Contribution of Diet, Physical Activity and Sedentary Behaviour to Body Mass Index in Women With and Without Polycystic Ovary Syndrome. *Hum Reprod*. 2013; 28(8): 2276-2283
- Nidhi R, Padmalatha V, Nagarathna R, Amritanshu R. Prevalence of polycystic ovarian syndrome in Indian adolescents. *J Pediatr Adolesc Gynecol*. 2011; 24(4): 223-27
- Pasquali R, Gambineri A, Pagotto U. The Impact of Obesity on Reproduction in Women with Polycystic Ovary Syndrome. *BJOG: An International Journal of Obstetrics and Gynaecology*. 2006; 113(10):1148-59
- PCOS Questionnaire: info@nutritionspecialists.com
- Rahul P, Pratik K C, Poulomi C, Vinodini NA, Prasanna M, Sourjya B, Suman VB, Sheila R P. Polycystic Ovary Syndrome, Blood Group & Diet: A Correlative Study In South Indian Females. *International Journal of Medical Research & Health Sciences (IJMRHS)*. 2014; 3(3): 604-609
- Rotterdam ESHRE/ASRM - sponsored PCOS consensus workshop group. "revised 2003/6/9 consensus on diagnostic criteria and long - term health risks related to polycystic ovary syndrome(PCOS). *Human Reproduction*. 2003; 19 (1): 41-47
- Teede H, Deeks A, Moran L. Polycystic ovary syndrome: a complex conditions with psychological, reproductive and metabolic manifestations that impact on health across the lifespan. *BMC Medicine* 2010; 8: 41