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Original Article

Comparison of Polycystic Ovaries in Obese and Non-Obese Patients

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ABSTRACT

Polycystic Ovarian Syndrome (PCOS) is a quite common feminine endocrine; metabolic and reproductive disorder principally affects females of reproductive age. It's multiple organ disorder affecting 5 to 10 % feminine population. The global incidence of PCOS is 105 million within the age ranges from 15 to 45 years. This metabolic pathology is closely connected with fatness, hirsutism, disease of the skin and physiological condition complications. Around 5-10% of feminine population is affected, and obese women are more prone to PCOS. **Objective:** To compare the polycystic ovaries between obese and non-obese females. **Methods:** A literature search was performed with the use of search engines. The following search engines provided the articles for this systematic review, PubMed, Medscape, NCBI, and Google Scholar. For article searching following keywords were used; Polycystic ovaries, obese and non-obese. **Results:** A literature of 300 articles was reviewed and only 39 were included, it was found that mean age of all subjects was 24-35 year; in obese it was 20-29 years and in non-obese it was 19-35 years. Hirsutism was observed mostly in obese patients of PCOS and not observed in non-obese. Incidence of Amenorrhea was higher in non-obese than obese patients. Acne was observed in all patients. **Conclusion:** It is concluded that there is a significant effect of obesity on clinical features of patients with PCOS.

INTRODUCTION

The definition of polycystic ovarian syndrome (PCOS) is initially represented as oligo/amenorrhoea hirsutism, fat and enlarged ovaries with multiple cysts and thickened tunica' by Stein and Leventhal in 1935 [1]. The first diagnosing of PCOS was utterly supported look on histologic examination of bilateral ovaries with thickened stroma i.e. polycystic ovaries (PCO), in females presenting with hairiness, anovulation or both [2]. Within the 1970s the introduction of immunochemical assay techniques as histologic diagnosing, serum biochemical markers characteristic of PCOS, elevated concentrations of luteinizing hormone (LH), androgen (T) and/or androstenedione (A), low or traditional levels of follicle stimulating hormone (FSH), and attenuated hormone binding simple protein (SHBG) became different diagnosing techniques [3]. PCOS could be a common pathology effecting 4–8 percent of ladies of reproductive age as estimated by the NIH/NICHD criteria [4-8]. Many studies have shown that its prevalence differs according to the applied diagnostic criteria. The Rotterdam criteria showed 2-3 times more prevalence than obtained using the NIH/NICHD criteria [9-12]. The main pathophysiology of PCOS remains unknown however; the key options embrace hormone resistance, abnormal gonadotrophic hormone dynamics and sex hormone excess. In distinction to insulin resistance, about 60 to 70% of ladies with PCOS are weighty, and fat is related to insulin resistance. Girls with PCOS have higher insulin resistance as compared that of over-weight females within the general population. Insulin response to associate oral glucose challenge was notably higher in patients with PCOS than in weight management subjects while not polycystic ovary syndrome [13]. Dunaif *et al*, conjointly found higher insulin resistance of patients with PCOS compared with management subjects was true for each lean and weighty patients with PCOS [14]. PCOS conjointly happens in 50% of ladies with not severe growth

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of unneeded hair.16 skin disease is a smaller amount prevailing in PCOS and not as frequent as hairiness however it may also be a marker of hyperandrogenism Around 15%–30% of adult girls with PCOS have clinical presentation of acne [17-21]. The distinction in prevalence of skin disease and hairiness is also thanks to the distinction in 5α reductase action within the sebaceous gland and also the hair follicle (almost 40% dihydrotestosterone), of ladies with skin issue and acne were diagnosed with PCOS. It's advocate to raise regarding emission history of ladies presenting with acne and evaluated for the opposite signs of hyperandrogenism [22]. There are 40% of ladies with PCOS were suffering from infertility. An ovulatory infertility condition is usually caused by PCOS [23]. 90%–95% of an ovulatory girls have PCOS. In females with PCOS the varieties of primeval follicles are normal however primary and secondary follicles are multiplied in number but, thanks to disorientation in factors affecting normal follicular development, follicular growth restricts as follicles grow to 4–8 millimetre, and ovulation doesn't begin as dominant follicles doesn't develop [24,25]. Abortion conjointly happens often in PCOS with incidences starting from 42%–73% [26,27]. The adoption of an authentic approach to characterize the morphology of the polycystic ovary is required for PCOS diagnosis using the Rotterdam and AES criteria. The Rotterdam criteria advocated the presence of ≥12 follicles measuring 2-9 mm in diameter and of volume ≥10cm^3 for polycystic ovarian morphology. This description is sufficient to characterize the polycystic ovary [28]. However, with the passage of time, ultrasound technology have made significant advancements, latest ultrasound technology has better resolution and smaller follicles are easily detectable [29]. These advancement prompted concerns revising the factors to outline polycystic female internal reproductive organ morphology. Allemand *et al.* conducted a study using 3D TVS to assess the mean follicle number per ovary (FNPO). This study involved more number of follicles in 10 patients with PCOs and 29 normoandrogenic ovulatory in control. PCO is regarded when mean FNPO is more than 20.1, with specificity and sensitivity of 100% and 70% respectively. In the case group, the specificity and sensitivity in most follicles over one sonographic plane were 100% and 9%, respectively. Ovarian volume assessed by 2D TVS, of more than 13 cm^{3}is expected as PCO with a specificity and a sensitivity of 100 and 50%, respectively [30,31].

METHODS

A literature search was performed with the use of search engines. The following search engines were used to search articles for this systematic review: PubMed, Medscape, NCBI, and Google Scholar. For article searching following keywords were used; Polycystic ovaries, obese and non-obese. After performing unbiased searching on databases only those articles were included using keywords polycystic ovaries, obese and non-obese. Only those articles were included in which patients was suffering polycystic ovaries in the population of female. Researches were assessed for quality as well as applicability. Extraction of data was done from full journal articles. Raw data were used for summary statistics if they were not reported.

RESULTS

As literature review of 30 articles and only 39 were included in this review, it is found that mean age of all subjects was 24-35 year. Obese 20-29 year and non-obese 19-35 year. Hirsutism was observed mostly in obese patient of PCOs and not observed in non-obese. Incidence of Amenorrhea was higher in non-obese than obese patients. Acne was observed in all patients.

DISCUSSION

As literature reviewed of 300 articles and only 39 were included in this review, it was found that mean age of all subjects was 24-35 years. Hirsutism was observed mostly in obese patient of PCOS and not observed in non-obese. Incidence of Amenorrhea was higher in non-obese than obese patients. Acne was observed in all patients. Several researchers and clinicians used multiple definitions for polycystic ovarian syndrome, which cause unpredictability and uncertainty in inconsistency around the diagnosis, pathogenesis and management of the disease [32,33]. Many researches have shown that Rotterdam criteria enhances the likelihood of detecting PCOS. Analytical parameters for grading polycystic ovary should be of practical value as it helps in increasing the frequency of diagnosis. This study introduced easy to use analytical parameters for ovarian dysfunction such as cycle length more than 35 days, less than 9 menstrual cycles per year or correlation amenorrhea with hormonal and metabolic parameters of PCOS. But also, this irregularity does not mean ovulatory dysfunction. Using ultrasonography as the conventional diagnostic tool may be perplexing, as polycystic ovarian appearance is a typical finding of ovulation problems and has nothing to do with PCOS. Jonard et al. in his study stated that that ovarian volume is a useful diagnostic parameter for diagnosis of PCOS [34]. Although ovarian volume is useful in determining the extent of cycle disruption, sonographic criteria are dependent on the operator's experience and may result in discrepancies in results. In 1925 to 1935 Stein and Leventhal founda relation between the presence of bilateral polycystic ovaries and signs of oligomenorrhoea, amenorrhea, hirsutism, acne and obesity [35]. With numerous researches it is now said that women can have polycystic ovaries in the absence of one or two mentioned features of hirsutism,

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obesity, menstrual irregularity or anovulation [36]. In fatty women with PCOS the incidence of acne, menstrual irregularities and hirsutism is high [37]. In study conducted by Emine Cosar et al., the incidence of hirsutism was 38% in normal weight women in our current study of 50 women 20 women had hirsutism. 59% of non-obese subjects and 25% had hirsutism. Incidence of hirsutism is more in younger subjects [38]. Patients with hirsutism were more nonobese in our study and the prevalence of hirsutism was low in obese. However excessive hair growth and hirsutism in PCOS positive women is complex and poorly understood. Hirsutism can be caused due to insulin resistance or hyperandrogenemia [39]. In a study conducted by CB bunker et al 150 women were recruited and 98 of them were scanned for PCOS out of these 98 women 69 women were diagnosed for PCOS. 70% of women with acne have polycystic ovaries on ultrasound but do not have any remarkable relation with the other features of the PCOS [40]. In our study all subjects had acne. Since we concluded that all women with acne should be evaluated for polycystic ovaries.

CONCLUSION

It is concluded that there is a significant effect of obesity on clinical features of patients with PCOS.

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