



CUTANEOUS MANIFESTATIONS OF POLYCYSTIC OVARIAN SYNDROME

Dermatology

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ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is a common heterogeneous endocrine disorder characterized by irregular menses, polycystic ovaries and hyperandrogenism. Aim: To determine the prevalence of various dermatological manifestations in patients of PCOS. Materials and **Methods:** A total of 100 women with features of PCOS, attending Dermatology and Gynecology out-patient department were included in the study. Detailed clinical history was taken. Patients were subjected to ultrasonography and hormonal assays. **Results:** In our study, prevalence of acne vulgaris, hirsutism, seborrhoea, acanthosis nigricans, androgenetic alopecia (AGA) and acrochordons was noted in 62%, 53%, 30%, 21%, 18% and 8% respectively. **Conclusion:** Cutaneous manifestations of PCOS account for considerable proportion of symptoms encountered by women with this syndrome and hence play a vital role in its early diagnosis.

KEYWORDS

Polycystic ovarian syndrome, acne vulgaris, hirsutism.

INTRODUCTION

The association of polycystic ovaries, amenorrhoea, hirsutism and obesity was first described by Stein and Leventhal in 1935.¹ Polycystic ovarian syndrome (Stein-Leventhal syndrome) is a common hyperandrogenic disorder women of reproductive age group and has major impact on quality of life due to infertility, obesity and various other clinical manifestations.

Genetic predisposition, environmental factors and disturbance of endocrine pathways play role in causation of this multisystem metabolic disorder.² It is a common disorder with an incidence varying from 5% to 10%.³

The hormonal and functional abnormalities of ovary that accompany PCOS are infrequent or absent ovulation, infrequent or absent secretion of progesterone, increased secretion of male hormones, persistent estrogen secretion, increased luteinizing hormone secretion, insulin resistance and cystic ovaries. The morphology of the polycystic ovary has been redefined as an ovary with 12 or more follicles measuring 2-9 mm in diameter and/or increased ovarian volume (>10 cm³).⁴

Due to excessive androgen production and insulin resistance,^{5,6} several women with PCOS develop acne vulgaris, hirsutism, androgenetic alopecia, acanthosis nigricans and acrochordons.

MATERIALS AND METHODS

A total of 100 women with clinical features of PCOS, fulfilling the Rotterdam Criteria 2003, attending Dermatology and Gynecology out-patient department were included in the study. Details of clinical, menstrual history and family history were taken. Cutaneous manifestations like acne, hirsutism, seborrhoea, androgenetic alopecia, acanthosis nigricans and acrochordons were noted. Patients were subjected to ultrasonography. Hormonal profile including follicle stimulating hormone (FSH), luteinizing hormone (LH), free testosterone, and dehydroepiandrosterone (DHEA-S) was done on the 2nd day of the menstrual cycle.

RESULTS

This study included 100 cases of PCOD, out of which 13 patients (13%) were in the age group of 11-20 years, 67 patients (67%) were in 21-30 years age group and 20 patients (20%) were in 31-40 years age group.

Positive family history of features suggestive of PCOS was present in 56 patients (56%).

History of irregular menses was noted in 68 patients (68%), among which, 54% had oligomenorrhoea, 11% had amenorrhoea and 3% had polymenorrhoea. Remaining 32 patients (32%) had regular menses.

Prevalence of obesity and overweight based on BMI was noted in 18% and 55% of patients respectively, whereas 27% patients had BMI within normal range.

Table 1: Percentage Of Various Cutaneous Manifestations Of PCOS

Cutaneous manifestation	Number of cases	Percentage
Acne vulgaris	62	62%
Hirsutism	53	53%
Seborrhoea	30	30%
Acanthosis nigricans	21	21%
Androgenetic alopecia	18	18%
Acrochordons	8	8%

Cutaneous manifestations noted in decreasing order of frequency were acne vulgaris (62%), hirsutism (53%), seborrhoea (30%), acanthosis nigricans (21%), androgenetic alopecia (18%) and acrochordons (8%).

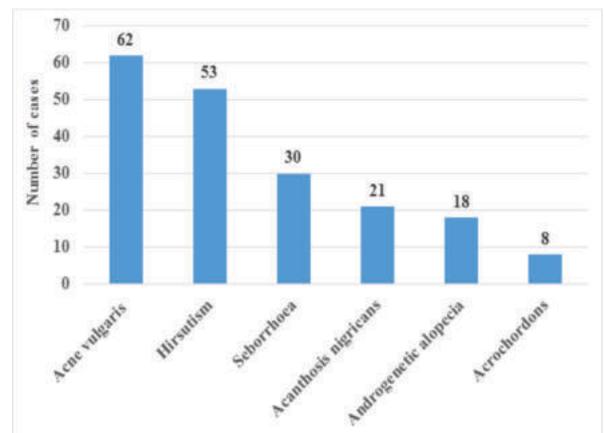


Figure 1: Distribution Of Various Cutaneous Manifestations Of PCOS

Among 62 patients with acne vulgaris, 20 patients (32.3%) had grade III severity acne, 16 patients (25.8%) had grade II acne, 14 patients (22.5%) had grade I acne and 12 patients (19.4%) had grade IV acne. Most common sites of hirsutism were chin (42 patients), upper lip (36 patients), lower abdomen (9 patients) and chest (6 patients). Neck and axilla were the most common sites of acanthosis nigricans and acrochordons in our study.

Out of 18 patients with androgenetic alopecia, Ludwig grade I alopecia was noted in 10 patients (55.6%), grade II in 6 patients (33.3%) and grade III in 2 patients (11.1%).

Increased levels of free testosterone was the most common hormonal change noted in 39 patients (39%) followed by increase in LH and FSH in 22% and 8% of the patients respectively.



Figure 2: Cutaneous Manifestations Of PCOS. (a) Acne Vulgaris. (b) Acanthosis Nigricans. (c) Acrochordons.



Figure 3: Cutaneous Manifestations Of PCOS. (a) Androgenetic Alopecia. (b) Hirsutism.

DISCUSSION

PCOS is a multi-factorial disease with a strong genetic influence. Ovarian production of excessive androgens result from an abnormal regulation of steroidogenesis.⁷ Majority of PCOS patients seek dermatology clinics for complaints like acne, hirsutism, alopecia, acanthosis nigricans, skin tags and less commonly for, darkening of complexion with weight gain.

In our study, majority of the patients (67%) belonged to age group of 21-30 years which was similar to study by Majumdar and Singh.⁸

Irregular menses was noted 68 patients (68%), among which, oligomenorrhoea (54%) was the most common menstrual irregularity observed followed by amenorrhoea (11%) in our study. This was in concurrence with study by Keen et al.⁹

Prevalence of obesity was 18% in our study, which was less in comparison to prevalence of 38.4% in a study by Balen et al¹⁰ in the year 1995.

Most common cutaneous manifestation noted among the study participants was acne vulgaris followed by hirsutism, similar to a study conducted by Abusailik et al.¹¹ Seborrhoea was present in 30% of patients, which was in concurrence with study by Keen et al (29%).⁹

Neck and axilla were the most common sites of acanthosis nigricans, noted in 21 patients (21%), similar to study by Gowri et al (22.5%).¹² Androgenetic alopecia was noted in 18% of study participants, which was less when compared to study by Ozdemir et al (31%).¹³ Acrochordons was less common cutaneous manifestation with a prevalence of 8% in our study and this was in concurrence with studies by Gowri et al¹² and Kaur et al.¹⁴

Most common hormonal change noted among study population was raised levels of free testosterone and was noted in 39% of patients. Increased levels of LH was noted in 22% of patients similar to a study by Jain et al (21%).¹⁵

CONCLUSION

PCOS is one of the most common endocrinopathy in women of child

bearing age group associated with long-term health risks. Various dermatological manifestations can serve as a marker of this multisystem disorder and has a role in its early diagnosis. Hence these skin changes help in early initiation of treatment, improve quality of life and psychological well-being of these patients.

REFERENCES

- Stein, I.F., & Leventhal, M.I. (1935). Amenorrhea associated with bilateral polycystic ovaries. *American journal of Obstetrics and Gynecology*, 29(2), 181-191.
- Franks, S., Gharani, N., & McCarthy, M. (2001). Candidate genes in polycystic ovary syndrome. *Human Reproduction Update*, 7(4), 405-410.
- Madhani, N., Khan, K., Chauhan, P., & Parmar, G. (2013). Polycystic ovarian syndrome. *Indian Journal of Dermatology, Venereology and Leprology*, 79(3), 310-321.
- Balen, A.H., Laven, J.S., Tan, S.L., & Dewailly, D. (2003). Ultrasound assessment of the polycystic ovary: International consensus definitions. *Human Reproduction Update*, 9(6), 505-514.
- Azziz, R., Carmina, E., Dewailly, D., Diamanti-Kandarakis, E., Escobar-Morreale, H.F., Futterweit, W., et al (2009). The Androgen Excess and PCOS Society criteria for the polycystic ovary syndrome: the complete task force report. *Fertility and Sterility*, 91(2), 456-488.
- Dunaif, A. (1997). Insulin resistance and the polycystic ovary syndrome: mechanism and implications for pathogenesis. *Endocrine Reviews*, 18(6), 774-800.
- Rosenfield, R.L., Barnes, R.B., Cara, J.F., & Lucky, A.W. (1990). Dysregulation of cytochrome P450c 17 alpha as the cause of polycystic ovarian syndrome. *Fertility and Sterility*, 53(5), 785-791.
- Majumdar, A., & Singh, T.A. (2009). Comparison of clinical features and health manifestations in lean vs. obese Indian women with polycystic ovarian syndrome. *Journal of Human Reproductive Sciences*, 2(1), 12-17.
- Keen, M.A., Shah, I.H., & Sheikh, G. (2017). Cutaneous Manifestations of Polycystic Ovary Syndrome: A Cross-Sectional Clinical Study. *Indian dermatology online journal*, 8(2), 104-110.
- Balen, A.H., Conway, G.S., Kaltsas, G., Techatrasak, K., Manning, P.J., West, C., et al. (1995). Polycystic ovary syndrome: the spectrum of the disorder in 1741 patients. *Human Reproduction*, 10(8), 2107-2111.
- Abusailik, M.A., Muhanna, A.M., Almuhsen, A.A., Alhasanat, A.M., Alshamaseen, A.M., Bani Mustafa, S.M., et al. (2021). Cutaneous manifestation of polycystic ovary syndrome. *Dermatology Reports*, 13(2), 8799.
- Gowri, B.V., Chandravathi, P.L., Sindhu, P.S., & Naidu, K.S. (2015). Correlation of skin changes with hormonal changes in polycystic ovarian syndrome: A cross-sectional study clinical study. *Indian Journal of Dermatology*, 60(4), 419.
- Ozdemir, S., Ozdemir, M., Gorkemli, H., Kiyici, A., & Bodur, S. (2010). Specific dermatologic features of the polycystic ovary syndrome and its association with biochemical markers of the metabolic syndrome and hyperandrogenism. *Acta Obstetrica et Gynecologica Scandinavica*, 89(2), 199-204.
- Kaur, S., Gupta, S.K., Juneja, S.K., Kaur, S., & Rani, M. (2020). Study of cutaneous manifestations of polycystic ovarian syndrome. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 9(4), 1627-1631.
- Jain, P., Jain S.K., Singh, A., & Goel, S. (2018). Pattern of dermatologic manifestations in polycystic ovarian disease cases from a tertiary care hospital. *International Journal of Advances in Medicine*, 5(1), 197-201.