

Frequency of polycystic ovarian syndrome among patients presenting with acne

Sadia Jabeen, Faria Asad, Zahida Rani*, Khawar Khurshid, Sabrina Suhail Pal

Department of Dermatology, King Edward Medical University, Mayo Hospital Lahore

* Department of Dermatology, Khawaja Safdar Medical College, Sialkot

Abstract *Objective* To determine the frequency of polycystic ovarian syndrome among patients presenting with acne.

Methods 200 female patients having grade I-IV acne vulgaris, fulfilling inclusion and exclusion criteria were enrolled in the study after taking informed consent. They were screened for the presence of polycystic ovarian syndrome (PCOS) by using Rotterdam criteria 2003.

Results Out of 200 females with acne vulgaris, 92 (46%) had polycystic ovarian syndrome. Age of the patients ranged from 14-40 years. In grade I to IV acne 6%, 16%, 12% and 12% patients had PCOS, respectively.

Conclusion Polycystic ovarian syndrome is not uncommon in patients with acne vulgaris. However it is not related to the severity of acne.

Key words

Acne vulgaris, polycystic ovarian syndrome.

Introduction

Acne is one of the most common skin disorders of adolescents and adults manifested by seborrhea, comedones, erythematous papules, pustules, nodules, pseudocysts and scarring.^{1,2,3}

It is a disease of pilosebaceous unit appearing on face, neck, back and pectoral regions.⁴ The pathogenesis is multifactorial involving increased sebum production, alteration of sebum quality, follicular hyperkeratinization, inflammation proliferation of *Propionibacterium acnes* and changes in hormone levels.⁵

Acne can also appear as a component of

different systemic diseases such as polycystic ovarian syndrome, congenital adrenal hyperplasia, seborrhea-acne-hirsutism-androgenic alopecia syndrome (SAHA) and synovitis-acne-pustulosis-hyperostosis-osteitis syndrome (SAPHO).⁶

Polycystic ovarian (PCO) syndrome is a common endocrinopathy of women of reproductive age.⁴ It is a disorder of androgen excess, with an estimated prevalence of 5 to 10% among general population.^{7,8} Zandi *et al.*⁹ reported that PCO syndrome is common among Iranian females who present with acne, with estimated prevalence of 60% that is ten times greater than general population. Excess of ovarian androgens can lead to wide range of symptoms such as acne, hirsutism, insulin resistance, obesity and cardiovascular disease.⁹

According to Rotterdam criteria 2003, PCO is a

Address for correspondence

Dr. Sadia Jabeen

Department of Dermatology

King Edward Medical University/

Mayo Hospital Lahore.

Email: sjmughal86@hotmail.com

syndrome of ovarian dysfunction, hyperandrogenism (clinical or biochemical) and polycystic ovary morphology on pelvic ultrasound (transabdominal or transvaginal). Out of three only two features are sufficient to diagnose it.¹⁰

In our country, no such study has been carried out and this research will help to establish frequency of PCO syndrome in acne patients. If found significant, we can start screening every female presenting with acne for PCO syndrome so that early detection will lead to early intervention and thus improved quality of life.

Methods

After taking informed consent, 200 females having grade I-IV acne (Indian classification),¹¹ between 14-40 years of age presenting in outpatient department of Dermatology, Mayo Hospital Lahore, from 1st January 2013 to 30th June 2013, were selected in the study. Females presenting before the onset of menarche and after menopause, pregnant, taking any hormonal treatment (oral contraceptive pills or injections) were excluded.

History regarding acne, hirsutism, seborrhea, alopecia, infertility, weight gain, darkening of skin in flexures, oligomenorrhea and amenorrhea was taken. They were examined for acne, hirsutism, seborrhea, alopecia and acanthosis nigricans. Height and weight were measured to calculate BMI.

Hormonal profile including total testosterone, follicular stimulating hormone (FSH), luteinizing hormone (LH), FSH/LH was obtained. Serum dehydroepiandrosterone and serum prolactin levels were done to rule out other causes of hyperandrogenism. Samples were taken on day 1-3 of menstrual cycle, while in patients with amenorrhea samples were taken

Table 1 PCOS in relation to each Acne Grade

Grade of Acne	No. of patients	PCOS n (%)
I	34	12 (06)
II	72	32 (16)
III	50	24 (12)
IV	44	24 (12)
Total	200	92 (46)

randomly. Pregnancy test was done in those presenting with amenorrhea.

All patients had transabdominal pelvic ultrasonography from radiology department for polycystic ovarian morphology. Data were analyzed through statistical package of SPSS 17. Quantitative variable like age was represented as mean±standard deviation. Qualitative variable like polycystic ovarian syndrome was presented in the form of frequency and percentages according to each acne grade.

Results

Out of 200 patients, 47% females belonged to 20-23 years of age group, with a age range of 15-38 years.

Among total patients of acne majority had grade II acne (36%) followed by those having grade III acne (25%). Out of 200 patients of acne vulgaris almost half were having PCOS. The frequency of PCOS in each acne grade has been shown in

Table 1.

Discussion

Studies from different parts of the world showed variable association between acne vulgaris and PCOS (**Table 2**). But no such study has been conducted in Pakistan to determine the frequency of PCOS in acne patients.

In our study 200 females having acne were enrolled. Majority of the patients were 20-23 years old. The mean age of patients was $22.10 \pm$

Table 2 Comparison of data reporting association of acne and PCOS.

Study	Total no. of Acne patients	PCOS in acne patients	% of PCOS
Zandi <i>et al.</i> ⁹	118	71	60.2%
Maluki ¹⁵	123	63	51.2%
Timpatanapong <i>et al.</i> ¹⁶	51	19	37.3%
Begum <i>et al.</i> ¹²	40	11	27.5%
Jabeen <i>et al.</i> (Present Study)	200	92	46%

4.09 years, while minimum recorded age was 15 years and maximum was 38 years. The results of this observation are similar to the study done in Iran by Zandi *et al.*⁹ where mean age of respondents was 22.1 ± 4.2 years. It is also comparable with the study done in Dhaka Bangladesh, by Begum *et al.*¹² where the mean age was 23.8 ± 5.7 years, and an Australian study in which it came out to be 23.6 ± 6.06 years.¹³ The possible explanation for this finding is that acne appears at time of puberty and adolescence, when androgen dependent increase in sebaceous gland activity occurs leading to seborrhea and comedone formation.¹⁴ However, most of the females present in OPD at time of their marriage due to cosmetic concerns of acne lesions and scarring.

In our study, the estimated frequency of PCOS in acne patients was 46%, which is comparable to other studies done in different parts of the world.^{13,15} Fraser *et al.*¹³ reported PCOS in 45.37% patients of acne in Australia. Study done by Maluki, in Iraq, on resistant acne cases also showed comparable results, 51.2% patients had PCOS compared with 6.2% in control group.¹⁵

Zandi *et al.*⁹ in 2010 carried out a study in 118 Iranian acne patients and 60.2% (71) patients were diagnosed as PCOS cases based on NIH criteria, in which only hyperandrogenism and oligomenorrhea are noted. Ultrasonography is not included in NIH criteria. We used the more

recent Rotterdam criteria, in which ultrasonography is added. In spite of including another diagnostic modality, our patients had lower prevalence of PCOS. The possible explanation of this finding might be due to difference in ethnicity and genetic makeup.

In Dhaka, Begum *et al.*¹² found that 11 (27.5%) out of 40 women with acne had PCO compared with 3.3% in control group. The frequency of PCOS is much lower than our study 27.5% vs. 46%.¹² Similarly in Thailand, Timpatanapong *et al.*¹⁶ reported lower prevalence of PCOS in acne patients. PCOS was found in 19 out of 51 acne patients (37.3%) and none of the control group had PCOS.¹⁶ The reason for decreased prevalence of PCOS in acne patients in studies from Dhaka and Thailand may be attributed to decreased prevalence of PCOS in their control groups.

However, various studies showed increased frequency of PCOS when diagnosed mainly by sonography method. Bunker *et al.*¹⁷ from London, reported higher ultrasonic prevalence of PCOS in acne patients that was 83%, compared with 19% in women without acne. Peserico *et al.*¹⁸ did a study on 119 Italian women with acne and 35 normal women were taken as control group. Polycystic ovaries were found in 45.4% of the cases and 17.1% of controls.¹⁸ Similarly Cibula *et al.*¹⁹ reported higher frequency of PCO that is 50% in acne patients. In a study by Zandi *et al.*⁹ PCOS was diagnosed in 48.3% (57) patients out of 118 acne patients by sonography method. In our study only 24% patients had PCO on ultrasound, which is much lower than the above-mentioned study. This can be explained by the difference in ethnic origin, operator's observation, resolution ultrasound of machines and the day of menstrual cycle at which ultrasound was done. Begum *et al.*¹² reported comparable ultrasonic prevalence of PCO in Bangladeshi females where 20% of acne

patients had polycystic ovarian picture on ultrasound. Thus, our study highlights the association between acne and polycystic ovarian syndrome. Patients with acne, if screened for PCOS, may have a better quality of life due to early detection of the disease.

Conclusion

On the basis of these findings we conclude that PCOS is present in almost half of our female acne patients. However, no relationship was found between PCOS and acne severity. It is therefore, suggested that female patients with acne of grade II and beyond should be screened for PCOS by history, examination and if necessary, pelvic ultrasonography and hormonal assays.

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