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Original Research Article

ADULT ACNE: A CLINICAL STUDY WITH SPECIAL REFERENCE TO POLYCYSTIC OVARY SYNDROME Shivani Yadav, Srishti Tripathi Soumya Agarwal, Titiksha Hans, Anshul Choudhary, Aditi Wadhwa

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Abstract

Background: According to Global Burden of Skin Disease study data, 2013, Acne affects nearly 85% of adolescents and young adults in the age group 12-25 years. traditionally it was considered to be a transitory disease of teenagers and young adults; however recent study reports indicate it to be a disease affecting all age groups in adults.

Aims: To study the clinical profile of adult acne, grade the severity using global acne grading system (GAGS) and to determine the proportion of Polycystic Ovary Syndrome (PCOS) in women with adult acne.

Material and Methods: Patients with acne in the age group of 25-60 years were included in the study. A detailed examination of clinical profile of acne was done along with grading of severity of acne using GAGS. Also, documentation of hyperandrogenism using Ferriman Gallwey score for hirsutism and diagnosis of PCOS using Rotterdam criteria was done in all female patients of acne.

Results: A total of 105 patients were included in the study. Among these, 82.9% were women and 17.1% were men. The mean age of the patients was 28.04±3.60 years. Persistent acne was observed in 85.7%, while late onset in 14.3%. Most common site of involvement was cheek (98%), followed by chin (76%), and forehead (64.7%). Mild grade acne was observed in 93.3% patients. Hyperpigmentation was seen in 78.1% while scarring was observed in 52.4% patients. A total of 8% female patients had PCOS according to Rotterdam criteria.

Conclusion: We found a predominance of females and persistent acne. Although the prevalence of PCOS was low in adult female acne patients, they were affected by more severe grades of acne and risk of hyperpigmentation and scarring was higher as compared to non-PCOS patients.

Introduction

Acne affects nearly 85% of adolescents and young adults in the age group 12-25 years. Among adolescents, it has a prevalence of over 90% and persists into adulthood in approximately 12%-14% of cases. Traditionally, it was considered to be a transitory disease of teenagers and young adults; however recent study reports indicate it to be a disease affecting all age groups in adults.

Acne vulgaris occurring at or beyond the age of 25 years is referred to as "Adult Acne". 3.4,5 Adult acne can further be subdivided into two subtypes: *Persistent acne* — that includes cases in whom continuation of acne is seen from adolescence to adult life or middle age; and *Late onset acne*: cases in whom acne occurs for the first time after the age of 25 years.

Acne occurs more frequently in females as compared to males. It is reported that 82.1% patients of adult acne are females. Premenstrual flare, hirsutism, alopecia, scarring and psychological stress is observed in a significant number of patients. The risk factors that play an important role in prevalence of adult acne in women include hormonal imbalances, stress, increased use of cosmetics, and exposure to hot and humid conditions.

Women with persistent acne often report lesions on most days and could report a premenstrual flare.

A high proportion of women with adult acne have been shown to suffer from polycystic ovary syndrome(PCOS). PCOS is a female anovulation disorder that is associated with hyperandrogenism, insulin resistance, metabolic disorders as well as acne and hirsutism. 7,8,9,10,11

We conducted this study to assess the clinical profile and severity of adult acne and to estimate the proportion of female patients with PCOS as an etiological factor.

Material and methods:

We conducted an observational study in the Department of Dermatology of Era's Lucknow Medical College & Hospital from January 2018 to November 2019.All patients of acne vulgaris in the age group 25 to 60 years were included in the study. The data was collected for clinical features of acne, grading of its severity, evidence of hyperandrogenism and investigations for diagnosis of PCOS using Rotterdam criteria. A detailed history of acne and menstrual cycles was taken. Complete examination was done including assessment of weight & height (for BMI), blood pressure, examination of acne for

morphology and distribution of lesions and markers of hyperandrogenism such as hirsutism and androgenetic alopecia. A grading of severity of acne was carried out using Global Acne Grading System (GAGS). If hirsutism was observed in a female, grading for hirsutism was done using "Ferriman Gallwey Score" (FG Score). A score of more than 8 was considered indicative of hyperandrogenism. 12,13

A pelvic sonography was done in all female subjects transvaginal sonography in married female and abdominal sonography in unmarried female. Diagnosis of PCOS was confirmed by presence of 12 or more follicles in each ovary measuring 2±9 mm in diameter, and/or increased ovarian volume (>10 ml). 14

Hormonal investigations such as Serum Free & Total Testosterone, S. Prolactin, S. DHEAS, S. Insulin and S. LH: FSH ratio were carried out in females when indicated (androgenetic alopecia, hirsutism, acanthosis nigricans).

Global Acne Grading System (GAGS)¹⁵Error! Bookmark not defined.

GAGS was devised by Doshi, Zaheer and Stiller in 1997.It provides a precise and comprehensive information about acne severity evaluating the type of acne lesions and the area affected. The system divides the face, chest and back into six areas (forehead, each cheek, nose, chin and chest and back) and assigns a factor to each area on the basis of size. Each type of lesion is given a value depending on severity: no lesions = 0, comedones = 1, papules = 2, pustules = 3 and nodules = 4. The score for each area (Local score) is calculated using the formula: Local score = Factor*Grade (0-4). The global score is the sum of local scores. Acne severity is graded using the global score. A score of 1-18 is considered mild; 19-30, moderate; 31-38, severe; and >39, very severe acne.

Ferriman Gallwey Score for hirsutism¹³

It is a system of grading of hirsutism in a female and is used for clinical evaluation of hyperandrogenism. It includes examination of nine sites (upper lip, chin, upper chest, upper abdomen, lower abdomen, upper arms, thigh area, upper back, lower back) for thick terminal hair and a score of 1- 4 is given depending on the hair population at the site being examined. Maximum total score is 36, while a score more than 8 is considered positive for hyperandrogenism and a score more than 15 indicative of severe hyperandrogenism.

Rotterdam Criteria for diagnosis of PCOS¹⁴

Rotterdam criteria are used for the diagnosis of PCOS. It considers clinical evidence of hyperandrogenism or laboratory evidence for the diagnosis of PCOS. A

consensus workshop sponsored by ESHRE/ASRM in Rotterdam in 2003, confirmed that diagnosis of PCOS can be made if any 2 out of 3 criteria stated by Rotterdam criteria are fulfilled. Rotterdam criteria states that two of the following three are necessary for the diagnosis of PCOS –

- 1. Oligo/anovulation (periods more than 40 days apart or presence of fewer than nine periods in a year).
- 2. Clinical and/or biochemical signs of hyperandrogenism.
- 3. Polycystic ovaries on ultrasonography(USG). [Presence of 12 or more follicles in each ovary measuring 2±9 mm in diameter, and/or increased ovarian volume (>10 ml)].

Results

The study included 105 patients of acne of age more than 25 years. We found a female preponderance (M:F=1:4.83),82.9% patients were females and 17.1% were males .The mean age of patients was 28.04±3.60 years in the range of 25-60 years. Persistent acne was seen in 90(85.7%) patients and late onset was seen in 15(14.3%).There was no statistically significant gender difference with respect to type of acne (p=0.751).

The most common site involved was cheeks 103(98%) with right cheek involvement in 103(98%) and left cheek in 99(94.2%) cases. It was followed by chin in80(76.1%), forehead in 68(64.7%), nose in52(49.5%), back in 3(2.8%) and chest in1(0.9%) respectively (Fig. 1). A statistically significant difference between two genders was observed for chin acne which was present in significantly higher proportion of women as compared to men (p=0.004).Majority of the patients 98(93.3%) had mild grade and only 7 (6.7%) had moderate grade (Fig. 2,3). None of the patients had severe or very severe grade of acne.



Figure 1: Inflammatory acne and post inflammatory hyperpigmentation over the lower one third of face.



Figure 2: Papules, pustules and erythematous scars in grade II acne.



Figure 3: Grade III acne

Only 2 (1.9%) patients were obese. None of the patients had hypertension or diabetes. Cosmetic use was reported by 17 (16.2%) patients. Family history of acne was positive in 22 (21%) cases while seasonal variation was reported by 17 (16.2%) cases. Scarring was observed in 55(52.4%) while 82 (78.1%) cases had hyperpigmentation (Fig. 4).



Figure 4: Hyperpigmenation in acne excoriee

USG was normal in majority of patients i.e. 84(96.6%).Only 3 (3.4%) patients had polycystic morphology on USG. A total of 15 (17.2%) women reported of premenstrual flare up. Oligomenorhea was reported by 16 (18.4%) women. Out of 87 women enrolled in the study, only 7 (8%) had PCOS according to Rotterdam criteria (Fig. 5).



Figure 5: Hirsutism over pre-auricular area.

Majority of PCOS cases had moderate grade acne 4(57.1%). Persistent acne was observed in 6 PCOS cases (85.7%) while late onset acne only in 1 (14.3%)PCOS case. Scarring and hyperpigmentation were seen in all the 7 (100%) PCOS cases. Cheeks and chin were most commonly involved sites in PCOS cases. None of the PCOS cases had deranged hormonal profile.

Discussion

Acne is a chronic inflammatory disorder of the pilosebaceous unit characterised by comedones and/or papules, pustules, nodules and cysts. Its common sequelae are dyspigmentation and scarring. It generally affects the adolescents and with increasing age the problem of acne seems to diminish. However, a sizeable

proportion of adults too experience acne. Among adult females, PCOS is a disorder that has a strong association with acne. It is believed that a large proportion of adult acne, particularly women, have polycystic ovarian syndrome as the underlying disorder. Unfortunately, the literature on adult acne is limited, particularly that from India is almost negligible. Hence, the present study was planned with an aim to study the clinical profile of adult acne and to determine the proportion of polycystic ovary syndrome in women with adult acne.

For this purpose we conducted a cross-sectional study of 105 adult patients (>25 years of age) presenting with acne. The age of patients ranged from 25 to 45 years and Most of the patients (81.9%) were aged 25-35 years. Majority of our patients were females (82.9%). Our findings were similar to those of Skroza*et al.* (2018) whoin their study conducted on 454 cases of adult acne observed majority (84.8%) were females. ¹⁶There was a dominance of persistent acne (85.7%) and only 14.3% had late onset acne. Khunger and Kumar in their study reported also reported a dominance of persistent acne in 73.2% of their patients with late onset in 26.8% patients. ⁵

In our study,cheek and chin were involved in 76.1% to 98% of patients. Forehead (64.9%) and nose (49.5%) were the other common sites. Back and chest were involved in only 2.8% and 0.9% cases. A statistically significant difference between two genders was observed for chin acne which was present in significantly higher proportion of women as compared to men. Involvement of face, particularly cheek and chin has been reported to be the most common site in most of the studies. Although the distribution is not yet clearly understood, the lesions in adult female acne tend to prefer the lower third of the face (mandibular line, perioral region and side of the neck).

The prevalence of risk factors like obesity, cosmetic use and family history in our study was 1.9%, 16.2% and 21% respectively. None of the patients had diabetes or hypertension. Seasonal variation was reported by 16.2% cases. Acne occurs due to an interplay of factors like follicular hyperkeratinization, hormonal influences on sebum production and composition, inflammation and microbial hypercolonization by *P. acnes*. Various exogenous risk factors also predispose to acne like dietary factors, use of cosmetics, UV radiation, alcohol consumption.

Most of our patients had mild acne 98(93.3%), only 7 (6.7%) patients had moderate grade. Addor and Schalka, however in their study among 116 adult women reported a dominance of moderate grade. ¹⁷Swathi and

Kusagar in their study reported moderate acne (80%) to be more dominant than mild (10%) and severe acne (8%). ¹⁸ In the study of Lakshminarayan ,61% had Grade II acne followed by Grade III (23%) acne. ¹⁹ Since majority of our patients had persistent acne, it is possible that the severity of acne got reduced owing to multiple treatments taken in the past.

A total of 52.4% of our patients had scarring (Fig. 6) and 78.1% had hyperpigmentation in our study. Khunger and Kumar in their study reported scarring in 76.4% cases which is higher than that observed in our study. However, Swathi and Kusagur reported scarring and hyperpigmentation in 46% and 30% of the cases. These sequelae form an important aspect in managing acne in adult patients because most of them are in marriageable age and poor cosmesis has a significant detrimental effect on their quality of lives.



Figure 6: Atrophic scar

The prevalance of PCOS in our study was 8% according to Rotterdam criteria and USG showed polycystic morphology in only 3 (3.4%) patients. However, most of the previous studies have reported a much higher incidence of PCOS ranging from 20% to as high as 60.2%.Premenstrual flare up and menstrual irregularities were reported by 17.2% and 18.4% of women in our study.It is possible that our patients presented to us earlier and suffered from subclinical hyperandrogenism instead of complete polycyctic ovary syndrome.(Table 1)

Table 1: Studies on PCOS in adult acne

SN	Author (Year)	No. of cases and profile	PCOS prevalence	Remarks
1.	Zandiet al. (2010) ²⁰ Error! Bookmark not defined.	118 (Mean age 22.1±4.2 Yrs)	60.2%	Included teenagers too (Age range 14 to 38 years)
2.	Kelekciet al. (2010) ²¹ Error! Bookmark not defined.	52 with mild acne	26.9	Included women in reproductive age group only.
3.	Begum <i>et al.</i> (2012) ²²	40 (19 to 40 yrs)	20%	-
4.	Abdullah et al.	155 (16-35	28.8%	Only 40% had acne onset at age

	- 55				
	(2013) ²³	years)		<u>></u> 20 years	
5.	Mehta- Ambalal (2017) ²⁴	36 reproductive age group	45%	-	
6.	Raja Shareef <i>et</i> al. (2018) ²⁵	100 (>18 years)	30%	-	
7.	Present study (2019)	87 women aged >25 years	8%	-	

No significant association of PCOS was observed with age and type of onset among women patients. However, we found that significantly higher proportion of PCOS women had acne on nose (100%) as compared to non PCOS women (46.3%). However, no significant difference between PCOS and non-PCOS women was observed for other sites. Also the proportion of patients having moderate grade of acne was significantly higher in PCOS (67.1%) as compared to non-PCOS (2.5%) women. Similarly, prevalence of scarring and hyperpigmentation was higher in PCOS group (both 100%) as compared to non-PCOS group (46.3% and 73.8% respectively). There was a statistically significant difference between two groups with respect to scarring. All these findings in effect suggest that though PCOS prevalence was quite low in our study, however, the clinical presentation of acne in PCOS women was associated with more severe grades as compared to non-PCOS women.

Acne as an androgen mediated dermatitis is often a symptom of diseases with abnormal androgen metabolism. Women with PCOS have raised serum androgen levels or a raised free androgen index and show insulin resistance, predisposing to acne. Excess adrenal androgen synthesis occurs in hyperinsulinaemia. Also, PCOS ovaries are more sensitive to insulin resulting in excess androgen production.

Conclusion:

The findings of present study were interesting, and provided a peculiar picture of adult acne in our settings. The findings suggested some gender-related differences, but corresponded with previous evidence showing a very low proportion of males as compared to females with adult acne. Moreover, the study found the proportion of PCOS among women acne patients to be quite low, perhaps minimum as compared to the previous studies evaluating this relationship. We recommend that screening for PCOS by USG and hormonal tests should be done only in those patients who show clinical signs of hyperandrogenism or those who respond poorly to common therapeutic strategies. The radical findings of present study need further validation in larger and multicentre studies.

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