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A DESCRIPTIVE STUDY OF THE CLINICO-EPIDEMIOLOGICAL FACTORS RELATED TO ACNE VULGARIS AT A TERTIARY CARE HOSPITAL

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ABSTRACT **Background:** Though acne is common in India, few have studied the clinico-epidemiological profile of acne vulgaris. **Aims:** To study the clinico-epidemiological profile of acne patients and possible correlation between acne and hirsutism, metabolic syndrome and acanthosis nigricans.
Material & Methods: A prospective cross sectional study of all consenting patients of acne vulgariswas conducted at a tertiary hospital between May 2015 and April 2016. Parameters recorded were age, age of onset, sex, occupation, grade of acne, exacerbating factors, premenstrual flare, menstrual cycle irregularity, family history of acne, addictions, dietary factors, socioeconomic status, site of involvement, post acne scarring, acne related pigmentation, presence of seborrheic dermatitis, hirsutism, metabolic syndrome and acanthosis nigricans.
Results: Prevalence of acne was 0.95%. Among 452 study patients, male: female ratio was 1.27:1 with amean age of 21.69years in females and 19.88 years in males. Mean age of onset of acne was 18.98 years in females and 17.73years in males. 25.66% patients had grade I acne, 59.73% had grade II acne, 11.28% had grade III and 3.32% had grade IV acne. Summer exacerbation was noted in 41.81% patients. Premenstrual flare was seen in 65.33% females and 12.56% had menstrual irregularity. Family history of acne was present in 55.75% patients. No association between dietary factors and acne severity was found (P>0.05). Face was involved in all (100%) patients, back in 13.27%, 9.96% had chest involvement, neck and upper arms were involved in 5.53% and 3.1% respectively. Post acne scarring was seen in 67.26% patients, 79.2% patients had post acne pigmentation and 24.78% patients had seborrheic dermatitis. Hirsutism, acanthosis nigricans and metabolic syndrome were seen in 11.56%, 4.42% and 0.88% patients respectively.
Conclusions: Our study is a detailed analysis of the clinico-epidemiological factors of acne vulgaris at a tertiary hospital.

KEYWORDS : acne vulgaris, comedones, hirsutism, acanthosis nigricans, metabolic syndrome

Introduction:

Acne vulgaris, a chronic inflammatory disease, of the pilosebaceous units characterised by seborrhoea, comedones, inflammatory papules and pustules and in severe cases nodules, deep pustules, pseudocysts and scarring.[1] Acne is more likely than any other disease to develop in a person's lifetime,[2] affects females earlier, possibly due to earlier onset of puberty and tends to be persistent as compared to males who have more severe forms of acne.[3] Severity of acne depends on the interaction of various clinical and epidemiological factors.

Very few studies of the clinico-epidemiological profile of acne vulgaris, possible relationship of acne with acanthosis nigricans, hirsutism and metabolic syndrome in India exist in literature.

Materials &Methods:

This prospective cross sectionalstudy was conducted at a tertiary hospital in Mumbai following approval from the Ethics Committee. All consenting patients with acne were included except those who were already on treatment for acne from outpatient department (OPD). Over all aim of the study was to study the clinico-epidemiological profile of acne patients.

Parameters evaluated were demographic details like age, age at onset, gender, occupation, duration of disease, aggravating and relieving factors, menstrual history, family history of acne, addictions, dietary history, socio-economic status using Kuppuswami scale[4]. Patients were examined in detail for acne, grading of acne[5], presence of scars according to Goodman and Baron qualitative post acne scarring scale[6], pigmentation, dandruff and seborrheic dermatitis[7], hirsutism (Ferriman Gallway score)[8] and acanthosis nigricans[9](AN) from all new patients who presented with acne vulgaris. Metabolic syndrome screening was done according toInternational diabetes federation definition[10,11]. Photographs of the patients were taken when necessary. Data were entered in Microsoft Excel and analysed using Stata Version 13.1.

Results:

Out of 47,444 total patients who attended dermatology OPD during April 2015 to May 2016, 452 new patients of acne were included in the study with a prevalence of 0.95% (2.02% in adolescents, 0.66% in adults, 0.96% in males and 0.94% in females) (table 1). Of the 452 patients, 199 (44%) were females and 253 (56%) were males with Male: Female ratio of 1.27:1, 208 (46%) were adolescents (10-19years) and 244 (54%) were adults (> 19years) (table 2).

Mean age of the patients was 20.68 years. The mean age of females 21.69 years was significantly higher than that of males i.e. 19.88years (p<0.05). Mean age of onset of acne was 18.28 years. Mean age of onset of acne among adolescent group i.e. 15.9 years was significantly lower than 20.31 years among adult group. Mean age of onset of acne among females i.e. 18.98 years was significantly higher than 17.73 years among males (P<0.05). Most commonly affected were students i.e. 298 (65.93%).

Out of 452 patients, 116 (25.66%) patients had grade I acne. The difference between severity of acne among adolescent and adult groups was not statistically significant (P=0.691) however the difference between severity of acne among females and males was statistically significant (P=0.025).

Exacerbation of acne in summer was reported by 189 patients (41.81%). Cosmetic use was reported to be associated with increase in acne in 144 (31.86%). Patients who had stress associated with acne were 88 (19.47%). Out of 199 female patients, 130 (65.33%) complained of premenstrual flare of acne which was more common in adult females (P=0.019). Also 25 females (12.56%) complained of menstrual irregularity.

Family history of acne was present in 252 (55.75%). Mean age of onset of acne in patients with family history was 17.55 years, significantly lower than 19.20 years (SD ± 4.55) in patients without family history. Less severe grade of acne was noted among smokers (34/452) as compared to non-smokers (P < 0.05). No association was found between dietary intake and acne severity (P > 0.05). Most patients belonged to lower middle class of Kuppuswami scale. (table 3)

Among study subjects, face was the most common area involved (100%), followed by back 60 (13.27%), chest 45 (9.96%), neck 25 (5.53%), and upper arms 14 (3.1%).

Scarring as a consequence of acne was seen in 274/452 (67.26%). Among these; 129 (47.08%) had macular scars, 135 (49.27%) had mild

scars, 31 (11.31%) had moderate scars and 9 (3.28%) had severe scars. A total of 358 (79.2%) had post acne pigmentation (figure 6). Seborrheic dermatitis was associated with acne in 112 (24.78%). Among these; 111 (99.1%) had seborrheic dermatitis and, only 1 (0.9%) patient had moderate severity of seborrheic dermatitis.

Twenty-three patients (11.56%) had hirsutism. No association was found between acne severity and hirsutism. Four patients (0.88%) had metabolic syndrome and 20 patients (4.42%) had acanthosis nigricans. Neither of the two conditions had any association with acne severity.

Discussion:
Acne vulgaris is a very common, chronic inflammatory disease of the pilosebaceous units[1]. Various hospital-based studies done on acne vulgaris in Asians have shown that acne vulgaris constitutes 11.2% and 19.6% of the total new patients attending their hospitals.[12,13] In this study, overall prevalence of acne was 0.95% which was similar to prevalence (1.068%) reported by Adityan et al.[14] from south India. We also reported prevalence of 2.02% in adolescents, 0.66% in adults, 0.96% in males and 0.94% in females.

In our study, male: female ratio was 1.27:1. This corresponds with the ratio of male to female of 1.25:1 in a study by Adityan and Thappa et al in 2009.[14] This probably reflects greater severity of acne in males as well as males being better able to access healthcare services. Mean age of the patients in our study was 20.68 years which was comparable to that reported by Adityan et al.[14] (19.78 years) while Kane et al.[15] found it to be 25.58 years in their study conducted in Senegal. In our study, mean age of females i.e. 21.69 years was significantly higher than that of males i.e. 19.88 years (p<0.05) contrary to this Al-Ameer and Al-Akloby[13], in their study of 225 patients with acne vulgaris observed that the age at presentation was 19.2 years for males and 18.4 years for females.

Mean age of onset of acne, 25.58 years in a study by Kane et al[15] was significantly higher than mean age of onset of acne in our study i.e. 18.28 years. Mean age of onset of acne among females i.e. 18.98 years was significantly higher than that of 17.73 years among males (P<0.05) in our study, whereas Adityan and Thappa et al[14] found it to be 15.9 years in males and 16.05 years in females. Acne vulgaris develops earlier in females than males probably due to earlier onset of puberty in females.[1] A majority of the patients were students (66.3%) in a study conducted by Adityan et al.[14] which was comparable to our study with 65.93% patients being students.

The difference between severity of acne among females and males was statistically significant in our study (P=0.025). We reported grade II acne (59.73%) as most common grade of acne whereas Adityan et al.[14] using same grading system showed grade I acne (60.2%) as the most common grade in south Indian patients.

Exacerbation of acne in summer was reported by 189 patients (41.81%). Adityan et al.[14] in 2009 reported 71 patients (23%) having exacerbated in summer as compared to 9 patients (2.9%) who exacerbated in winter. Some studies found winter to have more exacerbation of acne than summer.[13,16] Cosmetic product use was found to be associated with increase in acne in 144 (31.86%) in our study. Saraswat et al.[17] showed acne as the most common side effect of topical steroids used as cosmetics. Increased concern about appearance and peer pressure has led to greater use of such products in teens. Kane et al.[15] found a positive correlation with stress where 89.2% acne patients were stressed. Only 19.47% (88 patients) admitted to being stressed in our study.

One hundred thirty of our patients reported premenstrual flare of acne (65.33%) which was more common in adult females (P=0.019). Similar results were seen in studies by Adityan and Thappa et al., (57.7%) and Cunliffe et al. (70%).[7,18] Twenty-five females (12.56%) complained of menstrual irregularity in our study which was 10.2% - 48% patients in various studies.[7,19-21] Family history of acne was present in 252 patients (55.75%), which was 78% and 47% in studies conducted in China[22] and a study by Grossi et. al.[23] respectively. Also mean age of onset of acne in our patients with family history i.e. 17.55 years (SD ± 3.44) was significantly lower than 19.20 years (SD ± 4.55) in patients without family history.

Thirty-four (7.52%) were smokers in our study while Adityan et al.[14] found 3.2% to be smokers. Smokers had less severe acne than non-smokers (P < 0.05) unlike other studies.[24,25] Some studies reported

positive correlation[24] while some reported no correlation[26] between junk food and acne vulgaris. Grossi et al. reported a close association of acne with milk, cheese/yogurt and chocolates eaten for more than 3 days/week.[23] A positive correlation between glycemic load diet, milky diet and ice-cream was suggested by a study in Malaysian young adults.[27] Our study did not find a significant association between dietary intake and acne severity (P > 0.05).

Among study subjects, face was involved in all patients followed by back 60 (13.27%), chest 45 (9.96%), neck 25 (5.53%), and upper arms 14 (3.1%) in that order. Adityan et al.[14] found facial acne vulgaris in all the patients (100%), followed by back in 28.2%, chest 20.1%, neck in 9.4% and arms 10% in that order.

Various studies showed post acne scarring in 5.9% to 40.2% patients[14,15,28,29] which was less than our study (67.26%), out of which 129 (47.08%) had macular scars, 135 (49.27%) had mild scars, 31 (11.31%) had moderate scars and 9 (3.28%) had severe scars. A total of 358 (79.2%) of our patients had post acne hyper-pigmentation which was much higher than that of 67.7% by Kane *et al.*[15] and 24.6% by Adityan et al.[14] Seborrheic dermatitis was associated with acne in 112 (24.78%) in our study which was comparable with other studies at 21.35%-35%.[14,30]

Twenty three patients (11.56%) had hirsutism however no association was found between acne severity and hirsutism in our study. Other studies reported hirsutism in 0%- 21% patients of acne vulgaris.[19-21] Acne vulgaris is associated with many metabolic abnormalities. Serum cholesterol levels were significantly high in patients suffering from severe acne vulgaris.[31] In females, it is associated with polycystic ovary syndrome, with peripheral insulin resistance and hyper-insulinemia, whereas few data are available in males.[14] In our study, 4 patients (0.88%) had metabolic syndrome and there was no association between metabolic syndrome and acne severity. Twenty (4.42%) patients had acanthosis nigricans in our study and no association was found between acne severity and AN. In a study by Adityan et al.[14], AN was a marker of androgenicity in 52.9%. Acanthosis nigricans (20.0%) was the fourth most commonly observed dermatological manifestation preceded by acne (95.0%), hirsutism (60.0%), seborrhoea (47.5%), in a study on PCOS, conducted in Korea.[32]

Conclusion:
Males were seen in greater numbers than females. Mild to moderate grade i.e. grade I, II was the most common kind of acne among our patients. Summer season, cosmetic use, exam induced stress in students were common aggravating factors. Premenstrual flare of acne was more common in adult females than adolescent girls but there was no association between menstrual cycle and severity of acne. Family history of acne was associated with earlier age of onset of acne. Smokers had less severe acne as compared to non-smokers. No association between diet and acne severity was found. Face was the commonest area involved followed by back, chest, neck and lastly upper arms. No significant association was found between severity of acne and hirsutism, acanthosis nigricans & metabolic syndrome.

This study elucidates various clinic-pathological factors associated with acne vulgaris. As it was a hospital based study, its results may not necessarily be applicable to the general population. More community based studies are required to find out true prevalence of acne and the responsible factors in the community.

Table 1: Prevalence of acne in study subjects

	Adolescents	Adults	Males	Females	Total patients
No. of Patients	10157	37236	26329	21064	47393
Acne patients	208	244	253	199	452
Prevalence (%)	2.02	0.66	0.96	0.94	0.95
95% confidence intervals (%)	1.78-2.34	0.58-0.75	0.85-1.09	0.82-1.08	0.87-1.05

Table 2: Distribution of study subjects according to sex and age group:

Age group	Females n (%)	Males n (%)	Total n (%)
Adolescents	76 (36.54)	132 (63.46)	208 (100)
Adults	123 (50.41)	121 (49.59)	244 (100)

Table 3: Socioeconomic status of study subjects:

Kuppuswami class	Number of patients (n)	Percentage (%)
I (upper)	41	9.07
II (upper middle)	101	22.35
III (lower middle)	228	50.44
IV (upper lower)	80	17.7
V (lower)	2	0.44
Total	452	100

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