

## A CLINICAL STUDY OF ACNE VULGARIS

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### ABSTRACT

#### BACKGROUND

Acne vulgaris is a highly prevalent chronic inflammatory disease of pilosebaceous unit affecting teenagers and young adults. Prognosis of acne is generally good, especially in mild acne. But, this disease reduces the self-esteem, their sense of identity and can severely compromise quality of life. All clinicians caring for children and adolescents should be familiar with this problem. Early diagnosis, proper treatment and timely counselling reduce the overall impact of disease to individuals.

#### MATERIALS AND METHODS

This is a prospective study conducted in the Department of Dermatology at Government Medical College, Kottayam, Kerala, in 200 patients who presented to the outpatient clinic with a clinical diagnosis of acne vulgaris who have not yet received any medical treatment for the disease and consented to participate in the study.

#### RESULTS

Male-to-female ratio of 1.43:1. 61.5% patients were in the 2<sup>nd</sup> decade. 4% were more than 30 years old. Duration of the disease at the time of presentation ranged from 3 weeks to 30 years. 42.5% complained of mild itching and 18.5% had burning sensation. 48.5% attribute exacerbation of disease after food intake. 72.5% acne patients had seborrhoea. Hirsutism and Acanthosis nigricans were present in 7.31% and 4.87% female patients, respectively. 50% with hirsutism and 25% with Acanthosis nigricans had polycystic ovarian disease and severe grades of acne. 25.6% females complained of premenstrual exacerbation of the disease. 26% of the patients showed exacerbation in summer. Smokers had severe grades of acne vulgaris compared to nonsmokers. Comedones were present in all and they were the predominant lesions in majority. Inflammatory papules were the 2<sup>nd</sup> most common lesions. Severe grades of acne were more common in patients with age  $\geq$ 20 years. Severity of the disease increases with long duration of the disease. Relatively high incidence of post-acne scarring and post-inflammatory hyperpigmentation was observed.

#### CONCLUSION

Severe acne should be examined and investigated for underlying systemic diseases. Milk and dairy products have not much role for the exacerbation of acne in our area. 31% patients noticed exacerbation of their lesions after intake of eggs, 40(20%) after intake of oily food, 9(4.5%) after intake of milk and milk products, 9 after eating meat and 5 following intake of fish. Other exacerbating factors noted were summer month (26%), emotional stress (15.5%), sun exposure (23%), use of scalp oil (12%) and prolonged sweating (3%).

#### KEYWORDS

Acne Vulgaris, Propionibacterium Acne, Comedones Acne Scars.

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#### BACKGROUND

Acne vulgaris is a chronic, self-limiting and inflammatory disease of the pilosebaceous units occurring in the adolescent age group.<sup>1</sup> 90% of patients are between puberty and 30 years.<sup>2</sup> 54% of males and 40% of the females are above 20 years of age.<sup>3</sup>

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It is a polymorphic disease characterised by seborrhoea, open and closed comedones, erythematous papules and pustules.<sup>1</sup> The primary sites of involvement are face, chest, back and shoulders.<sup>1</sup> Pigmentation following the involution of the lesions may persist for several months. Permanent scars maybe left following the inflammatory lesions.<sup>4</sup>

Acne is a multifactorial disease. Predisposing factors are genetic, endocrine, diet, cosmetics, drugs, sunlight, seasonal variation, etc. Pathogenesis and aetiology are follicular epidermal hyperproliferation, excess sebum production, colonisation and activity of propionibacterium acnes and inflammation.<sup>5</sup> During the period of activity, the course is variable with spontaneous flare-ups and remissions.<sup>6</sup> This study was carried out to find out clinical

profile of acne vulgaris, the various environmental factors that can precipitate or aggravate acne vulgaris and to find out the complications and the sequelae of the disease.

**MATERIALS AND METHODS**

This prospective study was conducted in the Department of Dermatology at Government Medical College, Kottayam, Kerala. The study population included was 200 patients who presented to the dermatology outpatient clinic with a clinical diagnosis of acne vulgaris who have not yet received any medical treatment for the disease and consented to participate in the study.

A detailed history was taken regarding duration of acne, age of onset, relation of disease severity to stress, cosmetics, sun exposure, sweating, smoking, menstrual cycle, drug intake and use of indigenous medicines. Particular mention was given to the history of specific food items, which the patients noticed to have precipitated or exacerbated their disease.

History of concurrent or past diseases like seborrhoea and family history of acne with particular reference to scarring tendency was also taken. The acne prone areas were examined in detail regarding the sites of involvement, number and character of the lesions, the type of post acne scars and hyperpigmentation. Associations like hirsutism and Acanthosis nigricans were also noted.

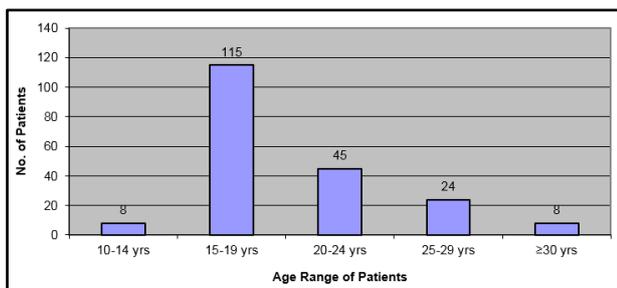
The diagnosis of acne vulgaris was made by the presence of comedones/papules with/without pustules/nodules/cysts and abscesses at the acne prone sites. The acne was graded using a simple grading system described by Tutakne et al.<sup>7</sup>

- Grade 1- Comedones and occasional papules.
- Grade 2- Papules, comedones, few pustules.
- Grade 3- Predominant pustules nodules and abscesses.
- Grade 4- Many cysts, abscesses, widespread scarring.

Routine investigations and other relevant investigations as indicated according to individual patients were done. Institute ethical committee clearance was obtained. Data collected from the patients were tabulated in a Microsoft excel worksheet and analysed.

**RESULTS**

Male-to-female ratio of 1.43:1. Age of the patients ranged from 12 years to 47 years. 123 (61.5%) patients were in the 2<sup>nd</sup> decade. The youngest patient was 12-year-old male and the eldest was a 47-year-old male.4% were more than 30 years old.



**Figure 1. Age Range of Patients**

148 patients were students, of which, 98 were males and 50 were females. Duration of the disease at the time of presentation ranged from 3 weeks to 30 years. 63.5% attended within 4 years of onset of the disease. 19.5% sought medical care within 1 year and 17.5% within 2 years of onset of the disease. 22 patients were having acne for more than 10 years at the time of presentation, and of these, 2 were having the disease for more than 30 years.

189 patients had onset of disease before 20 years of age, out of which, 95 had disease onset between 15 and 19 years and the remaining developed disease between 10 and 14 years. Only 11 (5.5%) had started developing lesions after 20 years. Nobody had history of disease onset after 25 years.

37.5% patients were asymptomatic. 42.5% complained of mild itching and 18.5% had burning sensation. Painful and tender lesions were present in 15.5% patients. 88 patients gave the history of frequent picking or squeezing of the lesions.

51.5% could not attribute their exacerbation to the intake of any particular food items. Among the remaining, 31% patients noticed exacerbation of their lesions after intake of eggs, 40 (20%) after intake of oily food, 9 (4.5%) after intake of milk and milk products, 9 after eating meat and 5 following intake of fish.

Other exacerbating factors noted were summer month (26%), emotional stress (15.5%), sun exposure (23%), use of scalp oil (12%) and prolonged sweating (3%). None of the patients had exacerbation of acne in winter season, cosmetic usage and were not on any drugs for chronic diseases. 9 male patients gave history of exacerbation during smoking, and among them, 3 had severe grades of acne.

72.5% acne patients had seborrhoea. Markers of androgenicity like hirsutism and Acanthosis nigricans were present in 7.31% and 4.87% female patients, respectively. None of them had diabetes mellitus. 50% with hirsutism and 25% Acanthosis nigricans had polycystic ovarian disease and severe grades of acne. 16 of the total 82 females in our study had irregular cycles and 21 (25.6%) complained of premenstrual exacerbation of the disease.

Skin types were type V in 54.5%, type IV in 30.5% and type III in 15%.

Types of Acne Lesions	Number of Patients	%
Closed comedones	200	100
Open comedones	127	63.5
Papules	130	65
Pustules	88	44
Nodules	22	11
Cysts	2	1
Abscesses	7	3.5

**Table 1. Showing the Type of Lesions Present**

Face was involved in all and facial involvement alone was seen in 38% patients. Extension of the lesions to the neck was present in 52.5% patients. Involvement of the upper trunk in 52.5% and upper arm in 24% patients. On

face, cheeks were involved in all, forehead in 82%, nose in 69.5% and jaw area in 57% patients.

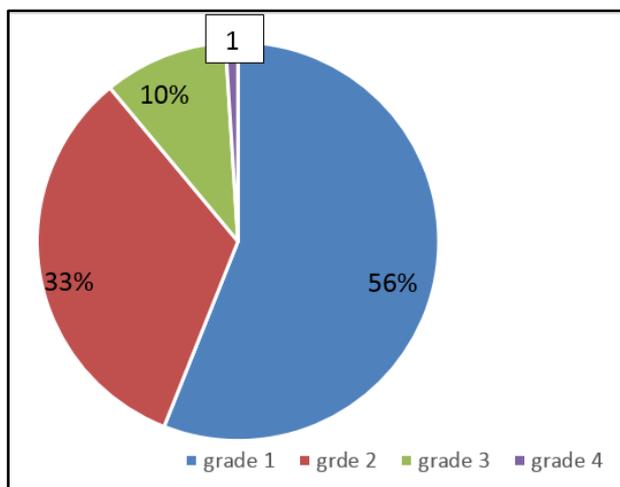


Figure 2. Grades of Acne

The severe grades of acne showed a peak age of onset between 10 and 19 years. It was observed that the severity of the disease increases with increase in the duration of the disease. Out of the total 57 patients presented with duration more than 5 years, grade 3 and 4 acne constituted 26.31% (15) patients, whereas in the other group of patients (total 143) with ≤5 years disease duration. The severe grades of acne constituted only 4.89% (7) patients.

**Scars-** Scarring was present in 59.5%. Cheeks were the most common site involved in all.

Icepick scars	31%
Box scars	16.5%
Rolling scars	4%

Table 2. Types of Scars

Post-acne hyperpigmentation was observed in 107 (53.5%) patients.

## DISCUSSION

Peak incidence was noted in the 2<sup>nd</sup> decade. 78% of the patients were students. The mean age of patients in a south Indian study was 19.78 years (SD ± 4.94).<sup>8</sup>

94.5% patients had onset of disease before 20 years of age, only 5.5% had started developing lesions after the age of 20. Androgen hormone, which is implicated as the initial trigger for acne is secreted more during pubertal age group in both males and females.<sup>2</sup>

37.5% of the patients were asymptomatic. Itching was the predominant symptom (42.5%). Acne is usually asymptomatic. Itching is a rare symptom of acne and maybe possibly relate to the release of histamine-like compounds from propionibacterium acnes. Inflammatory lesions maybe tender and painful. Reactive oxygen species produced by the neutrophils may have a role in mediating the inflammation in these lesions.

Historically, much debate has surrounded the subject of diet in the management of acne. Recently, there has been a reappraisal of the diet and acne because of a greater understanding of how diet may affect endocrine factors involved in acne.<sup>9</sup> High-glycaemic diets maybe a significant contributor to the high prevalence of acne seen in Western countries.<sup>9</sup> High-glycaemic diet stimulate the secretion of insulin, which triggers the release of IGF-1.<sup>10</sup> IGF-1 has direct effect on pilosebaceous unit and has been shown to stimulate hyperkeratosis and epidermal hyperplasia. High glycaemic diet also decreases sex hormone binding globulin concentration thereby increases free androgens.<sup>11</sup> These facilitate acne formation.

Another well-studied diet is milk and dairy products, which carry hormones and bioactive molecules, some of these products survive digestion, that have the potential to aggravate acne.<sup>9</sup> 51.5% could not attribute their exacerbation to the intake of any particular food items. But, 31% noticed exacerbation of the lesions after intake of eggs, 20% after intake of oily foods and 4.5% after intake of milk and milk products.

Although, many drugs including halogenated compounds, progestogens, oral contraceptive pill (sometimes it helps acne), corticosteroids, isoniazid and lithium are known to cause acneiform eruptions.<sup>12</sup> None of the patients in our series attributed their disease onset or exacerbation with intake of drugs.

The improvement of acne in summer and exacerbation in winter is a conventional dermatological concept.<sup>13</sup> Studies done in the past have shown varied results regarding seasonal variation in acne vulgaris. An Indian study showed that majority of patients with acne vulgaris worsened during summer.<sup>13</sup> In our study, also 26% of the patients showed exacerbation in summer.

Stress is frequently implicated in the aggravation of acne, while acne itself induces stress.<sup>14</sup> In our study, 15.5% patients had exacerbations during periods of emotional stress. Cutaneous neurogenic factors may contribute the exacerbation of disease.

According to Cunliffe et al, a positive family history of acne is obtained in 40% of patients.<sup>2</sup> 56% of our patients had first-degree relatives with present or past history of acne, and of these, 40% were having scarring.

It is well known that seborrhoea plays a central role in the pathogenesis of seborrhoeic dermatitis and acne vulgaris, because both are androgen-mediated diseases.<sup>16</sup> In a Spanish study involving 2159 patients with seborrhoeic dermatitis, it was found that 35% of the subjects had acne vulgaris. 72.5% patients had seborrhoea in our study.

Premenstrual flare of acne reportedly occurs in 70% of female acne patients.<sup>2</sup> The pilosebaceous duct becomes smaller between days 15 and 20 of the menstrual cycle and the blockage leads to premenstrual acne. Progesterone and oestrogen have pro- and anti-inflammatory effects and alteration or modulation of these hormones maybe another explanation.<sup>2,15</sup> Premenstrual flare was noticed in 25.6% of patients.

The incidence of hirsutism and irregular periods observed in earlier studies varied between 0% to 21%.<sup>16</sup> The corresponding figures in our study were 7.31% and 19.5%. Cibula et al reported that there is no correlation between acne severity and clinical markers of androgenicity in women.<sup>16</sup> But, Reingold and Rosenfield have found an association between acne, hirsutism and menstrual disturbance.<sup>17</sup> We observed that 50% hirsute and 25% of Acanthosis nigricans patients had severe grades of acne.

The relationship between smoking and acne vulgaris is controversial. We observed smokers had severe grades of acne vulgaris compared to nonsmokers. Since, the number of smokers is small, no valid conclusion can be derived from this. Impaired vasoreactivity, relative ascorbic acid deficiency, impaired collagen synthesis and wound healing in smokers may play some part in the underlying pathogenesis for the association between smoking and acne.<sup>18</sup>

Acne vulgaris is a polymorphic disease.<sup>1</sup> The primary and the pathognomonic lesion of acne vulgaris is comedones.<sup>19</sup> Closed comedones were present in all patients in this series and they were the predominant lesions in 58.5%. Acne vulgaris occurs in sites, which are rich in pilosebaceous units. We noticed facial particularly cheek involvement in all patients, upper trunk and neck was involved in 52.5% and arms were involved in 24%. These observations are in accordance with other studies.<sup>1,2</sup>

Although, it is a hospital-based study, patients with grade 1 (predominantly comedonal) acne vulgaris outnumbered than more severe inflammatory forms of the disease.

Severe grades of acne were more common in  $\geq 20$  years. This is in accordance with studies conducted by Collier et al, which showed that severe acne occurred commonly in patients of older age group.<sup>20</sup> According to Goulden V et al, males tend to show severe forms of the disease.<sup>5</sup> But, we observed severe grades of acne more prevalent in females (8%) compared to males (3%).

It was observed that the severity of the disease increases with increase in the duration of the disease. Out of the total 57 patients presented with duration more than 5 years, 26.31% patients had grade 3 and 4 acne, whereas 143 patients with  $\leq 5$  years duration, the severe grades of acne constituted only 4.89%. In a south Indian study conducted by Adithyan et al, it was found that patients with longer duration of the disease had more severe acne vulgaris.<sup>8</sup>

Post-acne scarring was noticed in 59.5% of our acne patients. The icepick scars were the most common type (52.1%). Post-acne hyperpigmentation was observed in 53.5% of the patients in our study. The findings in our study were in accordance with those of Kane et al.<sup>19</sup>

The relatively high incidence of post-acne scarring and pigmentation maybe a phenomenon in the South Indian race with skin type IV and V.<sup>1,19</sup>

## CONCLUSION

57.5% patients were in the age group 15-19 years and the majority was students. 63.5% of the patients presented within 4 years of the onset of the disease. A definite association between dietary factors and acne exacerbation could not be found in 51.5% of the patients. Seasonal variation was observed in only 28% of the patients, most of them showing exacerbation during summer months. Most common associated disease was seborrhoea of the scalp. Face was involved in all cases and face involvement alone was seen in 76 patients.

Closed comedones and inflammatory papules were the predominant lesions. Severe grades of acne were more prevalent in females above 20 years. Hirsutes and females with Acanthosis nigricans had severe grades of acne. 94.5% of the patients had their disease onset before 20 years of age and none had their onset of disease after the age of 25. Severity of acne is directly proportional to the duration of the disease.

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