

## CLINICOBACTERIOLOGICAL STUDY OF ACNE VULGARIS

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## Summary

The aetiological relationship of *Propionibacterium acnes* in acne vulgaris has been suggested. A clinicobacteriological study in 45 patients suffering from acne vulgaris was conducted for the first time in Indian patients. *P. Acnes* could be isolated from 18 (40.0%) and other propionibacterium species from 9 (20.0%) of the 45 patients studied. No correlation of culture positivity with the sex of the patient or duration and grade of the disease could be established. *P. acnes* antibodies were tested for in 33 and 20 patient sera by agglutination and immunodiffusion tests respectively. Immunodiffusion test was positive in 5 (25%) of the 20 patients sera and agglutination test in 25 (75.7%) of the 33 patients and in only 1 (9.9%) of the 11 controls studied. The difference in the incidence of *P. acnes* agglutinating antibodies in patients versus control was statistically significant ( $p < 0.001$ ).

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous glands seen primarily in the adolescent age group. Various factors like heredity, diet, hormone and bacteria have been suspected to play an etiological role. In spite of the intense efforts of research workers, the pathogenesis of acne is still not clear. It has been alleged that bacteria play a definite role in the pathogenesis of acne vulgaris<sup>1</sup>. A clinicobacteriological study on 45 patients suffering from acne vulgaris was conducted for the first time in Indian patients with regard to the type of bacteria in acne lesions. A comparison was made between the incidence of *P. acnes* antibodies in patients with acne vulgaris and controls.

## Material and Methods

Forty five patients with acne vulgaris treated in the Dermatology outpatients

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department of the All India Institute of Medical Sciences Hospital, New Delhi were randomly selected for the study. Age, sex, duration and grade<sup>2</sup> of the disease and treatment taken were recorded. Patients suffering from grade I acne were excluded from the present study as it was not possible to get suitable material from the lesions for bacteriological examination. Pus or sebaceous material extracted from the lesions was cultured fresh for aerobic and anaerobic bacteria. Anaerobic bacterial cultures were done on brain-heart infusion agar (Difco) with 1% glucose and thioglycollate broth with Tween 80<sup>3</sup>. Sera from 33 patients and 11 controls were tested for *P. acnes* agglutinating antibodies<sup>4</sup>. Sera from 20 patients were also tested by Immunodiffusion test using sonicated *P. acnes* antigen<sup>5</sup>.

## Results

Out of the 45 cases of acne vulgaris studied, 20 were males and 25 females. Thirty eight of the 45 patients were in the 15-24 years age group. There was

a definite correlation between duration of the disease and grade of the acne. Aerobic and anaerobic bacteria isolated from acne lesions is given in Table 1.

TABLE 1

Bacteria isolated from 45 cases of acne vulgaris		
Bacteria	No.	%
<b>Aerobes :</b>		
Staphylococcus albus	36	80
Klebsiella pneumoniae	2	
β Haemolytic streptococci	1	
Micrococci	1	
Diphtheroids	1	5 11.1
<b>Total</b>	<b>41</b>	
<b>Anaerobes:</b>		
Propionibacterium acnes	18	40.4
P. Lymphophilum	7	
P. Avidum	1	
P. Freudenreichii ss shermanii	1	9 20.0
<b>Total</b>	<b>27</b>	

TABLE 2

P. Acnes antibodies in patients and controls

Antibodies	Category	No. tested	Positive No.	%
Agglutinating	Patients	33	25	75.8
	Controls	11	1	9.1
Immuno-diffusion	Patients	20	5	25.0
Agg. test	Patients vs. Controls	p = L 0.001		

The sera from 25 (75.8%) of the 33 cases and 1 (9.1%) of 11 controls had *P. acnes* agglutinating antibodies (Table 2). Immunodiffusion test was positive in only 25% of the 20 sera tested. The mean agglutinating antibody titres increased with the duration of the disease (Table 3). There was no correlation

between *P. acnes* agglutinating antibodies and immunodiffusion test.

Discussion

Although acne vulgaris is a common condition in adolescents there are few adequately documented reports in the literature with regard to its precise incidence. The present study revealed that 38 among the 45 patients were in the 15-24 years age group with almost equal distribution in both the sexes. The severity of the disease was directly related to the duration.

*Staphylococcus albus* was isolated from 36 (80%) and propionibacteria from 27 (60%) of the 45 cases. Both *Staph albus* and *propionibacteria* were present in 21 cases. *Staph albus* and propionibacterium alone were seen in 11 and 4 cases respectively. Similar findings are reported by others<sup>6,7</sup>. Based on biochemical criteria propionibacterium species other than *P. acnes* were also isolated from 9 patients in the present series. This has not been reported by the other workers. In the present study, 25 (75.8%) of the 33 sera tested had *P. acnes* agglutinating antibodies as compared to only 1 (9.1%) out of the 11 controls. This difference between the cases and controls was statistically highly significant (P < 0.001). Mean agglutinating antibody titres increased with the duration and grade of the disease which suggests a causal relationship of *P. acnes* in acne vulgaris. High levels of agglutinating and complement fixing antibodies and dermal hypersensitivity to *P. acnes* in patients

TABLE 3

Correlation of agglutinating antibodies with duration of acne

Duration in years	No. Tested	Reciprocal of antibody titres					mean	Total No	%
		8	16	32	64	256			
Less Than 1	12	2	4	1	1	—	22.0	8	66.5
1-2	7	—	3	1	1	—	34.7	6	85.8
More Than 2	14	1	1	1	7	1	69.1	11	78.6

with pustular and cystic acne has been demonstrated<sup>4,8,9</sup>. The aetiological role of *P. acnes* has also been demonstrated in human experimental model<sup>10</sup>. An intradermal injection of *P. acne* has given intense erythema and induration at the injection site in acne patients as compared to normal subjects<sup>11</sup>.

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