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ORIGINAL ARTICLE

Frequency of Helicobacter pylori infection in patients of acne vulgaris

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ABSTRACT

Background: Acne vulgaris is a common complaint throughout the world, contributing to both morbidity and healthcare costs. Helicobacter pylori (HP) infection is also a world heath problem, and recent evidence suggests that two conditions may be related. However, there is insignificant evidence to support a casual association of HP infection and acne vulgaris.
Aim: To determine the frequency of helicobacter pylori infection in patients of acne vulgaris
Study design: Descriptive, cross-sectional study**.**
Settings and duration: Dermatology Department, Liaquat University of medical and health Sciences (LUMHS), Civil Hospital, Hyderabad from 22nd August 2017 to 21st February 2018
Methods: A total of 135 patients, 13 to 30 years of age of both genders with acne vulgaris were included in this study. Patients with H Pylori infection positive without acne vulgaris, family history helicobacter pylori infection, chronic smoker or alcoholics were excluded. Patients were subjected to relevant investigations i.e. HP antibody titer, for that blood sample of each patient was sent to institutional pathology laboratory for measuring of serum levels of anti H. Pylori IgG antibodies where each report was prepared by consultant pathologist.
Results: Mean age was 23.33 ± 4.14 years. Out of these 135 patients, 48 (35.56%) were females and 87 (64.44%) were males with female to male ratio of 1:1.8. Frequency of helicobacter pylori infection in patients of acne vulgaris was seen in 107 (79.26%) patients.
Conclusion: This study concluded that frequency of helicobacter pylori infection in patients of acne vulgaris is very high and these patients should be screened for helicobacter pylori infection
Keywords: Acne, helicobacter pylori, association

INTRODUCTION

Acne is very common multifactorial chronic inflammatory disease of the skin that involves pilosebaceous units. The aetiological factors includes androgenic stimulation of sebaceous glands, hyperproliferation/ hyperkeratosis of follicular epithelium, infrainfundibular inflammation, and increased colonization of corynebacterium acne[1]. Abnormalities in androgenic metabolism causes increased insulin resistance, affects cell to cell signaling pathway and cause uncontrolled inflammation which results in different skin disorders including acne vulgaris.[1,2] About 85% of adolescent population and 3% of the adults between the age of 35-44 years have this disease worldwide.[1,3] Although it is not a life threatening condition, it can lead to low self-esteem, mood disorders especially depression which adversely affects the quality of life[4].

At time of puberty, androgen levels particularly testosterone increase in blood which can precipitate acne in adolescents.[5] Acne mostly affects those areas of skin which are rich in pilosebaceous units; like the face, the upper part of the chest, and the back.[6] Acne can be manifested in both inflammatory and non-inflammatory forms. The skin lesions are formed due to changes in pilosebaceous units,[7]skin structures comprising of a hair follicle and its attached sebaceous gland leading to formation of comedones, papules, pustules and in severe cases nodules and cysts. Acne scar formation can be caused as a result of severe inflammation leading to hyperproliferation of dermal tissue or more commonly, destruction and atrophy of local tissue.[8] The type and severity of acne scars are generally related to the degree of inflammatory process, extent of tissue damage and to the duration of disease from the onset of tissue inflammation[8,9].

Helicobacter pylori (HP) is a gram negative bacterium that is involved in the pathogenesis of peptic ulcer disease, gastric lymphoma and gastric carcinoma. Apart from its know associations with gastro-duodenal diseases some authors reported a possible association of HP in multisystemic disorders including metabolic, hematological, autoimmune, cardiovascular, neurological and dermatological diseases. Among dermatological diseases, role of HP infection is well documented in chronic idiopathic urticaria and rosacea. Besides there are few case reports relating a link between HP and psoriasis vulgaris, behcet's disease, alopecia areata, henoch-scholenlein pupura and sweet's syndrome[10].

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In years 2014 Khodaeinai E et al, showed in his case-control study on 100 (25 control, 75 cases) patients. The frequency of HP infection was found in 56% of control group, 60% in the cases of mild acne vulgaris, 72% of moderate and 88% of severe acne vulgaris patients. Frequency of HP infection was significantly associated with severity of acne comparing with controls (p = 0.01). Mean serum IgG was also significantly high in the group with severe disease (1.87 ± 1.62U vs 2.98 ± 1.29U, p = 0.05).[11]

Acne vulgaris is a common complaint throughout the world, contributing to both morbidity and healthcare costs. Helicobacter pylori infection is also a world heath problem, and recent evidence suggests that two conditions may be related. However, there is insignificant evidence to support a casual association between HP infection and acne vulgaris per se. More so, there are very limited data in acne vulgaris patients addressing the impact of HP infection on various severities. Therefore the rational of this study was to investigate the frequency of HP infection in patients of acne vulgaris along with its potential relationship with severity of acne vulgaris, with a particular focus on patients with severe disease. The study will increase awareness of the population and health practitioners as far as management strategy is concerned on the co-existence of HP infection with acne vulgaris, so that early detection and treatment with HP infection eradication therapy can be made possible, thus preventing disease severity.

The objective of the study was to determine the frequency of helicobacter pylori infection in patients of acne vulgaris at department of dermatology, Liaquat University Hospital, Hyderabad."

OPERATIONAL DEFINITIONS:

Acne vulgaris: Patients were labeled to have Acne vulgaris if they had non- inflammatory lesions including open or closed commedones (blackheads and white heads), or Inflammatory lesion, including papules, pustules or nodules (also known as cysts and these findings were confirmed by senior consultant Dermatologist who had vast experience in dealing such kind of patients.

Helicobacter Pylori infection: Patients were considered to have positive with HP infection if their HP antibodies titers was >1.1 U/ml.

PATIENTS & METHODS

This descriptive, cross-sectional study was conducted in Dermatology Department, Liaquat University of medical and health Sciences (LUMHS), Civil Hospital, Hyderabad from 22nd August 2017to 21st February 2018. Sample size of 135 cases had been calculated using WHO sample size calculator, taking confidence level as 95%, margin of error 5.5%and expected rate of HP infection in cases as 88%. Sample technique used was non-probability, consecutive sampling.

Inclusion Criteria:

- Known cases of acne vulgaris (as mentioned in operational definition) for at least one year were included
- Either gender (male and female)
- Patients 13 to 30 years of age

Exclusion Criteria:

- H.pylori infection positive without acne vulgaris
- Chronic smokers or alcoholic
- Family history helicobacter pylori infection
- Already on antibiotics, H2 blocker, proton pump inhibitors or steroid therapy
- Patients who refused to give consent to be participated in the study

Data collection: The patients who met the inclusion criteria were enrolled in this study. All the cases of acne vulgaris diagnosed according to the operational definition presented in outdoor patient department were included in the study. Demographic characteristics like age, gender and body mass index (BMI) of the patients were done. After taking detailed history and full clinical examination (general and local), patients were subjected to relevant investigations i.e. HP antibody titers, for that blood sample of each patient was sent to institutional pathology laboratory for evaluation of serum levels of anti HP IgG antibodies where each report was prepared by consultant pathologist. A written informed consent was taken from all the participants of the study and the data was recorded on a proforma. The primary outcome variable was assessment of helicobacter pylori infection in patients of acne vulgaris.

Data analysis: All the collected data was analyzed with SPSS version 24.0. Mean and Standard deviation for quantitative variables like age, height, weight and BMI was calculated. Frequency along with percentage was calculated for qualitative variables like gender, occupation, socioeconomic status and HP antibody titer. Stratification and post-stratification was done to control effect modifiers e.g. age, gender, BMI, occupation and socioeconomic status. hi square was used for the analyses of their effect on the outcome. P-value ≤0.05 was considered as significant.

RESULTS

In this study, age distribution was between 13-30 years with mean age of 23.33 ± 4.14years. Majority of the patients 111 (82.22%) fell in the age group of 21-30 years as shown in Table I.

Among 135 patients, 48 (35.56%) females and 87 (64.44%) males with male to female ratio of 1.8:1.0 were enroled in this study (Figure I). Mean height was 157 ± 11.09 cm. Mean weight was 73.89 ± 6.78kg.Mean BMI was 29.47 ± 2.54 kg/m^2 (Table II). Distribution of participants based on their occupation and socioeconomic status is shown in Figure II & Table III respectively.

Helicobacter pylori infection was found in107 (79.26%) patients of acne vulgaris as shown in figure III. Stratification of helicobacter pylori infection according to the age groups and gender is shown in Table IV &V respectively. Stratification of helicobacter pylori infection according to BMI and occupation is shown in Table VI and VII respectively. Stratification of helicobacter pylori infection according to socioeconomic status is shown in Table VIII.

Table-I: Distribution of patients with Age groups (n=135).

Age (years)	n	%age
13-20	24	17.78
21-30	111	82.22
Total	135	100.0

Mean ± SD = 23.33 ± 4.14 years

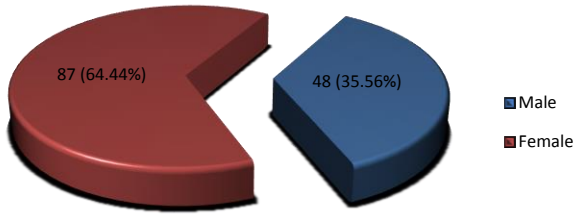

Figure-I: Distribution of patients based on Gender (n=135).

Table-II: Distribution of patients based on BMI (n=135).

BMI (in kg/m^2)	n	%age
≤30	71	52.59
>30	64	47.41
Total	135	100.0

Mean ± SD = 29.47 ± 2.54

Figure-II: Distribution of patients according to occupation (n=135).

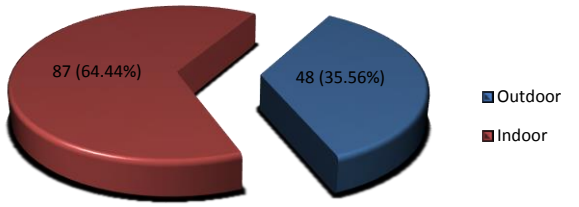

Table-III: Distribution of patients according to socioeconomic status (n=135).

Socioeconomic status (Income per month)	n	%age
<10000	52	38.52
10001-20000	38	28.15
>20000	45	33.33

Figure III: Frequency of helicobacter pylori infection in patients of acne vulgaris (n=135)

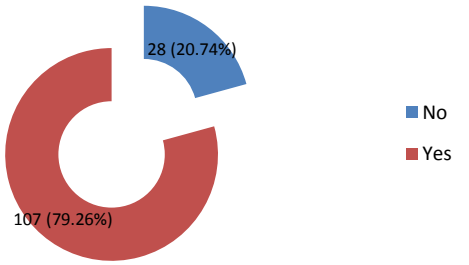

Table IV: Stratification of helicobacter pylori infection with respect to age groups.

Age (years)	Helicobacter pylori infection	
	Yes	No
13-20	19 (79.17%)	05 (20.83%)
21-30	88 (79.28%)	23 (20.72%)

P value 0.990

Table V: Stratification of helicobacter pylori infection with respect to gender.

Gender	Helicobacter pylori infection	
	Yes	No
Male	30 (62.50%)	18 (37.50%)
Female	77 (88.51%)	10 (11.49%)

P value 0.0001

Table VI: Stratification of helicobacter pylori infection with respect to BMI

BMI (kg/m^2)	Helicobacter pylori infection	
	Yes	No
≤30	55 (77.46%)	16 (22.54%)
>30	52 (81.25%)	12 (18.75%)

P value 0.588

Table VII: Stratification of helicobacter pylori infection with respect to occupation.

Occupation	Helicobacter pylori infection	
	Yes	No
Indoor	68 (78.16%)	19 (21.84%)
Outdoor	39 (81.25%)	09 (18.75%)

P value 0.672

Table VIII: Stratification of helicobacter pylori infection with respect to socioeconomic status.

Socioeconomic status (Income in per month)	Helicobacter pylori infection	
	Yes	No
<10000	44 (84.62%)	08 (15.38%)
10001-20000	28 (73.68%)	10 (26.32%)
>20000	35 (77.78%)	10 (22.22%)

P value 0.430

DISCUSSION

Acne is a chronic inflammatory disease affecting predominantly the central part of the face characterized by comedones, papules, pustules nodules and cysts. Rosacea is an associated disease characterized by erythema and telengectasias along with above mentioned lesions.[12]Various reports have documented an association of rosacea with different gastro-intestinal disorders including peptic ulcer disease. More recently numerous studies have described that Helicobacter pylori (Hp) is also associated with multiple dermatological diseases.[13,14] This study was conducted to determine the frequency of helicobacter pylori infection in patients of acne vulgaris.

In this study, age distribution was between 13-30 years with mean age of 23.33 ± 4.14years. Majority of the patients 111 (82.22%) fell in the age group of 21-30 years. Among 135 patients, 48 (35.56%) females and 87 (64.44%) males with male to female ratio of 1.8:1.0 were enroled in this study. Helicobacter pylori infection was found in107 (79.26%) patients of acne vulgaris. In 2014 Khodaeinai E et al, showed in his case-control study on 100 (25 control, 75 cases) patients. The frequency of HP infection was found in 56% of control group, 60% in the cases of mild acne vulgaris, 72% of moderate and 88% of severe acne vulgaris patients. Frequency of HP infection was significantly associated with severity of acne comparing with controls (p = 0.01). Mean serum IgG was also significantly high in the group with severe disease (1.87 ± 1.62U vs 2.98 ± 1.29U, p = 0.05)[11].

In one study,[15] 26 patients with the age of 26-82 years were enrolled out of which 14 were males and 12 were

females with male: female ratio of 1.6:1. Three (11.53%) patients had Grade IV acne. 14 out of 26 (53.8%) patients had acid peptic disease. IgG antibodies to H. pylori were present in 17 out of 26 (65.4%) of patients. Seropositivity of H. pylori was statistically significantly high in patients of acne as compared t control group[15].

Lazaridou et al evaluated different studies and reported that high prevalence of anti-Hp antibodies was found in humans and the antibiotics are effective for the treatment of both disease diseases, it would be difficult to stratify the population studied against multiple factors which influence both acne and H. pylori infection.[16] Similarly, in another study done by Diaz et al.[17] positive correlation was found between prevalence of H.pylori and severity of acne.

H.pylori leads to formation of increased number of reactive oxygen species like inflammatory cytokines and superoxide.[18] These toxic metabolites enhance the inflammation of the gastric mucosa as well as pilosebaceous units in skin[19] leading to Acne vulgaris[20]. Secondly, increased inflammation of sebaceous glands leads to seborrhea. So it is suggested that HP infection might significantly be associated with seborrhea.[2]Another possible mechanism which can lead to the development of acne vulgaris is the direct involvement of HP. According to researches, there may be cross-reactivity between HP and extra digestive antigens present in the skin.[22] Further HP produces an enzyme, lipase. This enzyme has significant role in the pathogenesis of Acne vulgaris. This lipase activity of HP significantly correlates the association of HP with Acne vulgaris[23].

CONCLUSION

Frequency of helicobacter pylori infection in patients of acne vulgaris is very high. So, we recommend that awareness programs should be arranged for the population and health practitioners as far as management strategy is concerned on the co-existence of HP infection with acne vulgaris, so that early detection and treatment with HP infection and eradication therapy can be made possible, so that we may adopt preventing strategies to reduce disease severity.

Limitations: Our study limitation is that there was no control group, Our study was a single centre study with relatively smaller sample size so results of this study can't be generalized to whole population of the country.

Recommendations: Multicenter studies are need of the day to be conducted among all the provinces of Pakistan with larger sample size so their results will be representing the regional differences in this disease and can help the health policy makers to devise a strategy to get the recommendations of that study need to be implemented as national guidelines for each province to improve the overall health care quality & delivery in the country.

Contribution of authors: **ZK:** Conception of the study, Data collection, Review of literature, Review of manuscript, Development of Research Methodology Design, Study Design, **HBAK:** Review of literature, Review of manuscript, Development of Research Methodology Design, Study Design, final approval of manuscript, **AA:**Data analysis & Data Interpretation, Review of literature, Review of manuscript, **HM**: Development of Research Methodology Design, Study Design, **KB:** Data analysis & Data Interpretation, Review of literature, Review of manuscript, **AZKC**: Article writing, Review of Literature, Drafting article, Data analysis & Data Interpretation, final approval of manuscript

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