Epidemiology Study of *Cutibacterium (Propionibacterium) Acnes* in Zakho City, Iraq Kurdistan Region

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Abstract. Acne vulgaris is the most common skin disorder globally. The aim of this study was to determine the epidemiology of acne in Zakho City. The study included 1000 adolescent patients, aged 13 to 17 years, presenting to a dermatologist practice in Zakho City. All participants completed a brief enrollment questionnaire to engage their infection with acne and they participated in the ABO blood group test, additionally their knowledge about Acne vulgaris infection. The results of this study have shown that percentage of acne infection among males and females in total was 49.2%. The highest number was appearing in a Male student with 26.6% and it was higher than female infection which records 22.6%. It worth to mention the O blood group is the highest population among ABO blood groups that can carry acne vulgaris infection with 20.6%. While O- blood group recorded 0.8% only among the population group. This study shows that the Acne vulgaris infection is endemic among secondary school students in Zakho city. However, more research is needed to be done to help students of avoiding this kind of infection in their teenage.

Keywords: Acne, ABO blood group, and epidemiology

1. Introduction
Acne is estimated to affect 9.4% of the global population, making it the eighth most prevalent disease worldwide. It can cause an important psychological problem. Studies have shown acne can significantly impair self-image and the ability to form relationships. However, it is widely suspected that the anaerobic bacterial species *Cutibacterium (Propionibacterium) acnes* the response for the infection [1] [2] [3].

Acne is the most common disease of the human skin. It affects 85% of youths, with 42.5% of men, and 50.9% of women between the ages of 20 and 30 years [4] [5] [6]. Acne is an almost universal condition in younger people, relatively little is known about its epidemiology. In 2015, acne was estimated to affect 633 million people worldwide, making it the most common disease globally with substantial costs [7] [8]. Acne is an inflammatory skin condition brought on by overactive sebaceous glands (oil glands). It usually involves the face, and frequently the chest and back [9] [10]. At puberty, the oil glands in the skin begin producing an oily material called sebum. Sebum is discharged onto the skin surface through pores. With acne, the oil glands become plugged causing pimples, blackheads, whiteheads, and cysts [11] [12]. It is suggested that acne could be explained by a sequence of related events, beginning with blockage of the skin follicle by excessive dead skin cells, followed by the bacterial invasion of the hair follicle pore, changes in sebum production, and inflammation [1] [13] [8].
Despite acne being an almost universal condition in younger people, relatively little is known about its epidemiology in Zakho city. In addition, no study has been published about acne epidemiology study neither in Duhok nor in Zakho City. Therefore, the objective of this study is to determine the epidemiology of Acne vulgaris infection in Zakho City, as well as the acne relationship with the ABO blood group.

2. Methodology
This study was designed to measure the epidemic of Acne vulgaris infection in Zakho City. This study included random of 1000 adolescent students (patients), from secondary school presenting to a dermatologist in Zakho general hospital. The participants were students aged 13 to 17 years, with 500 male students and 500 female students, All participants completed a brief questionnaire to engage their infection with acne and been tested for their ABO blood group additionally their knowledge about Acne vulgaris infection.

The participants were divided into 2 main groups, Infected with acne and not infected with acne. Then divide to other groups of the male student group and female student group. The last division of groups was to adjust the number of the infected students with acne to their ABO blood groups. The total number of each group was measured to % number. Then total infection was referred to epidemiology description.

3. Results
The results of this study have shown that total of 1000 participants in this project to study the acne infection in Zakho Secondary school and percentage of acne infection among males and females in total was 49.2%. The highest number was appearing in a Male student with complete no 266 and 226 cases for female students. This indicates that the male percentage was 26.6% of infection with acne and it was higher than female infection which records 22.6 % individually. This indicates that Acne Vulgaris infection is endemic in Zakho City among secondary school students. It worth to mention the O blood group is the highest population among ABO blood groups that can carry acne vulgaris infection with 20.6 % in total percentage.

| Acne  | A+ | B+ | AB+ | O+  | A- | B- | AB- | O- | Total |
|-------|----|----|-----|-----|----|----|-----|----|-------|
| Male  | 61 | 78 | 31  | 90  | -  | 6  | -   | -  | 266/500 |
| Female| 41 | 47 | 7   | 116 | 4  | -  | -   | 11 | 226/500 |
| Total | 102| 125| 38  | 206 | 4  | 6  | -   | 11 | 492/1000 |
| Total%| 10.2|12.5|3.8  |20.6 |0.4 |0.6 |0.11 |0|49.2 |

Table 1. The percentage of a Male and Female group of students subjected to acne infection

Total number with acne infection
1. Individually Male no. = 266
2. Individually Female no. = 226
The Acne infection percentage (%) of Total male + female number = (492X100)/1000 = 49.2%
The Acne infection percentage (%) of Total male = (266X100)/1000 = 26.6%
The Acne infection percentage (%) of Total female = (22.6X100)/1000 = 22.6%
The Acne infection percentage (%) of Total O blood Group = 20.6%
4. Discussion
A recent study showed that the prevalence of acne among a group of teenage respondents was 82.9%, and was strongly age-dependent with highest rates in the age groups of 13-15 and 16-19 years. The prevalence of pre-pubertal acne among participating girls and boys was 69.9% and 73.6% respectively [7] [10]. However, in this study, results show that half of this number is infected with acne with a ratio of 49.2% and this reflects that some group society in Kurdistan Zakho city is taking care of their lifestyle and food habit and school hygiene. The pervious publication shows that few different skin problems are a part of acne such as whiteheads, blackheads, and cystic acne. Other parts of problem like dirt, fried foods or chocolate, it may cause acne as well [8] [11] [12]. In addition, what can make Acne worse is oil-based makeup, suntan oil, hair gels and sprays, stress, women period, cutting the pimples during the irritation and cleaning skin too hard [14] [15] [16]. Nevertheless, more efforts are still needed to stop this endemic of acne infection.

A study by researchers published on the American Journal of Nutrition suggested that what can make acne better is having fewer breakouts in the food like to add more whole grains, beans, and veggies and cut back on pasta, white rice, white bread, and sugar. Furthermore good sleep, exercise helps cut stress, which may contribute to acne outbreaks. Physical activity also helps the skin by increasing blood circulation, which sends more oxygen to the skin cells and carries cell waste away [9] [5]. To keep in mind that sweat from exercise can also lead to breakouts by irritating the skin. So it's important to take shower right after exercises. It worth to mention also, increasing the amount of water human drink is a great way to flush out internal toxins and hydrate the skin from the inside out. Researcher’s shows that toxins lead to breakouts, through having about 2 cups of water daily, significantly boosted blood flow throughout the body and skin and sports exercise will reduce acne infection [5] [17].

Moreover, the result of this study shows that the male percentage of infection with acne was higher than female infection. This is very comparable with the previous study as it shows more male patients were more frequently affected, particularly with more severe forms of Acne [13] [16][11]. There are specific sub-strains of P. acnes associated with normal skin and moderate or severe inflammatory acne [6] [7] [18]. These strains have the capability of changing, spreading, or familiarizing to the abnormal cycle of inflammation, oil production, and inadequate sloughing off dead skin cells from acne pores. Infection with the parasitic mite Demodex is associated with the development of Acne [3] [16]. Thus, based on the result of this study it can be said that this type of bacteria might be well spread among the school students.

In addition, our results show that the highest number of infection with acne with O blood group among ABO blood group. This still very unclear to tell now how this has an impact but it may reflect that they might be more prone to the infection or have less immunity system to defend them from Acne vulgaris infection.

5. Conclusion
Acne is an almost universal condition in younger people, relatively little is known about its epidemiology. This study, indication shows that the Acne Vulgaris infection is endemic in Zakho City, Iraq Kurdistan region among secondary school students. Need more learning and research to be done to help students of avoiding this kind of infection in their teenage. A possible association between fatty food intake and Acne requires closer analysis. Natural sunlight or poor hygiene is not associated. The association between ABO blood groups and food habit and Acne is probably due to puzzling. Validated core outcomes in future studies will help in combining future evidence. Classification of Acne and the severity of Acne vulgaris can be classified as mild, moderate or severe to determine appropriate treatment.
6. Acknowledgment
The author would like to thank the University of Zakho, the ministry of health at Kurdistan region, Iraq (KRG) especially the General Hospital at Zakho for all the facilities provided. In addition, the author would like to thank the Education Directorate at Zakho, Duhok KRG Iraq for their support and cooperation.

References
[1] Adebamowo CA, Spiegelman D, Danby FW, Frazier AL, Willett WC, Holmes MD. High school dietary dairy intake and teenage acne. *Journal of the American Academy of Dermatology*. 2005 Feb 1; 52 (2):207-14.

[2] Bhate K, Williams HC. Epidemiology of acne vulgaris. *British Journal of Dermatology*. 2013 Mar 1; 168(3):474-85.

[3] Beylot C, Auffret N, Poli F, Claudel JP, Leccia MT, Del Giudice P, Dreno B. Propionibacterium acnes: an update on its role in the pathogenesis of acne. *Journal of the European Academy of Dermatology and Venereology*. 2014 Mar 1; 28 (3):271-8.

[4] Gollnick H, Cunliffe W, Berson D, Dreno B, Finlay A, Leyden JJ, Shalita AR, Thiboutot D. Management of acne: a report from a Global Alliance to Improve Outcomes in Acne. *Journal of the American Academy of Dermatology*. 2003 Jul 1; 49 (1):S1-37.

[5] Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, Marks R, Naldi L, Weinstock MA, Wulf SK, Michaud C. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *Journal of Investigative Dermatology*. 2014 Jun 1; 134 (6):1527-34.

[6] Mahmood SN, Bows WP. Diet and acne update: carbohydrates emerge as the main culprit. *J Drugs Dermatol*. 2014; 13: 428-35.

[7] Vary Jr JC. Selected disorders of skin appendages-acne, alopecia, hyperhidrosis. *The Medical Clinics of North America*. 2016 Jan 19; 99 (6):1195-211.

[8] Vos T, Allen C, Arora M, Barber RM, Brown A, Carter A, Casey DC, Charlson FJ, Chen AZ, Coggeshall M, Cornaby L. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*. 2016; 388(10053):1545-602.

[9] Titus S, Hodge J. Diagnosis and treatment of acne. *American family physician*. 2012 Oct; 86 (8):734-40.

[10] Karciauskiene J, Valiukeviciene S, Gollnick H, Stang A. The prevalence and risk factors of adolescent acne among schoolchildren in Lithuania: a cross-sectional study. *Journal of the european academy of dermatology and venereology*. 2014 Jun 1; 28(6):733-40.

[11] Bettoli V, Zauli S. The epidemiology and comorbidities of severe acne in children aged 0–17 years. *British Journal of Dermatology*. 2014 May; 170(5):1013-4.

[12] Zouboulis CC, Jourdan E, Picardo M. Acne is an inflammatory disease and alterations of sebum composition initiate acne lesions. *Journal of the European Academy of Dermatology and Venereology*. 2014 May 1; 28 (5):527-32.
[13] Barnes LE, Levender MM, Fleischer AB, Feldman SR. Quality of life measures for acne patients. Dermatologic clinics. 2012 Apr 1; 30 (2):293-300.

[14] Burris J, Rietkerk W, Woolf K. Acne: the role of medical nutrition therapy. Journal of the Academy of Nutrition and Dietetics. 2013 Mar 1; 113(3):416-30.

[15] Knutsen-Larson S, Dawson AL, Dunnick CA, Dellavalle RP. Acne vulgaris: pathogenesis, treatment, and needs assessment. Dermatologic Clinics. 2012 Jan 1; 30(1):99-106.

[16] Dawson AL, Dellavalle RP. Acne vulgaris. Bmj. 2013 May 8; 346 (7907):30-.

[17] Melnik B. Dietary intervention in acne: Attenuation of increased mTORC1 signalling promoted by Western diet. Dermato-endocrinology. 2012 Jan 1;4(1):20-32.

[18] Simonart T, Dramaix M, De Maertelaer V. Efficacy of tetracyclines in the treatment of acne vulgaris: a review. British journal of dermatology. 2008 Feb 1; 158(2):208-16.