Retrospective Epidemiological Study on Acne Profile of Patients Consulting in the Department of Dermatology in Chu Baabda

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ABSTRACT

Background: Acne is a complex and multifactorial disorder of pilosebaceous unit with characteristic lesions that may range from mild to severe. Several pathogenic factors are involved starting by obstruction of sebaceous follicles to the microbial colonization of pilosebaceous units by Propionibacterium acnes, which promotes perifollicular inflammation. **Objective:** The purpose of this study is to define the demographic distribution of acne, to reveal the main risk factors and to show the most appropriate treatment. **Methodology:** Retrospective study using a questionnaire on a population of 200 persons older than 12 year old consulting at CHU Baabda from March 2014 till September 2014. **Results:** The study proves that acne is more common in female with a ratio of 3/1, mainly over the face (97%). Diet represents the major risk factor (85.5%). Considering the treatment, the severity of acne will determine the appropriate therapy starting by topical creams for mild acne and ending with systemic drugs for more severe types. **Conclusion:** Acne is more prevalent in female adolescents, more commonly over the face with predominance of the comedogenic type. Diet especially rich in sugar, was on top of risk factors. Therapy is beneficial once given according to the clinical type.

INTRODUCTION

Acne, previously a well-known disease of adolescence, is nowadays a syndrome with several types, forms, severity, affecting multiple age groups with different underlying etiologies.

An important component of the skin is the sebaceous gland that can be implicated in many disorders affecting the skin. Seborrhea is a major one that can be complicated by acne, one of the most variable and stressful skin disorders.

Acne vulgaris is a self-limited disorder, it usually starts at puberty affecting 90 % of teenagers but 10 to 20% of adult continue to experience some form of the disorder [1].

In its pathophysiology, acne involves the hyperplasia of the sebaceous glands in response to androgens hyper stimulation, the hyper proliferation and desquamation of keratinocytes, the colonization of follicular duct by *Propionobacterium acne* and thus the development of inflammation [2]. This is related particularly to the role of the microbiome; our skin contains multiple types of microorganisms, one of them is the *P.acnes* which in the condition of hyperseborrhea will lead to the development of acne [3].

The clinical hallmark of acne is the comedone (small cysts, formed in the hair follicle due to the blockage of the follicular orifice by retention of keratinous material and sebum) [1], those can be opened (blackhead) or closed (whitehead), and are localized in the most seborrheic areas.

Acne can be classified depending on the presence of inflammation or not: the non inflammatory and the inflammatory lesions and those are then graded depending on the number and the type (kligman classification, Cunliffe classification…). It can be also classified depending on severity into mild, moderate, moderately severe and severe; classification based on the elementary lesions that are present [2].

Acne is always described as a multifactorial problem, with different risk factors: genetic background, diet (chocolate, fatty food...) to cosmetics products, underlying endocrinopathy, or multiple medications (glucocorticoids, oral contraceptive pills, lithium, isoniazid, androgenic steroids, phenytoin, phenobarbital...) [1].

The goal of treatment is to eliminate comedones: normalization of follicular keratinization, decreasing sebaceous gland activity, decreasing colonization by *P.acnes*, decreasing

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inflammation. Depending on severity and degree of inflammation, appropriate treatment will be given; ranging from topical therapy (antibiotics, retinoic acid, benzoyl peroxide or salicylic acid) to systemic drugs (antibiotics, synthetic retinoid isotretinoin...)[1]. Note that to have a complete cure there is only 2 ways: wait for a spontaneous remission or prescribe isotretinoin… otherwise, relapses are common until having spontaneous remission [4].

The objectives of our study were to define the role of diet in the pathogenesis of acne and thus considering it as a risk factor, to define the demographic distribution of acne, the most prevalent type, the most common localization and the appropriate treatment to preserve time, cost and decrease the psychiatric impact on patients.

METHODS

Our study is a retrospective epidemiological study, done on a population of 200 patients, chosen randomly, male and female older than 12 year-old consulting at CHU Baabda, Lebanon from March 2014 to September 2014. Data collection was achieved via a questionnaire. After collecting the different informations concerning demographic distribution, acne profile, risk factors, appropriate therapies, the data were analyzed using Microsoft Office Excel Worksheet formulas: a mean of the most prevalent factor was calculated and a comparison with the previous studies was done.

RESULTS

Acne is more common in female than in male with a ratio of 3 to 1, with a mean age of 19 years old. The majority of patients were nonsmoker.

Concerning the acne profile, the face was involved in the majority of our patients (97%) followed by the back, the chest, the extremities and finally the neck in 4.5%. Comedogenic type was the most prevalent (27%). Scar occurred just in 7% of cases.

Multiple factors have been implied in the pathogenesis of acne, from these diet and family history were the most prevalent in our sample.

A previous therapy was applied in 77 % of our population, before the presentation to our clinic. From these therapies, a course of PO antibiotics (clindamycin or doxycycline) was the most commonly used and usually associated to a topical tretinoin. Another common regimen was topical antibiotic with peroxide benzoyl or topical tretinoin.

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After consultation in our clinics, Oral antibiotics (mainly doxycycline) were mostly used (a course of 2 months); Isotretinoin was used for 2, 3 or 6 months depending on the type of acne, its severity and the response to therapy. These therapies were complicated by a hypotrophic scar in 0.8%, cheilitis occurred in a single case.

DISCUSSION

Acne is a common skin disorder affecting mainly adolescents with an average age of 19 years old, it can affect older persons but in this case an underlying pathology must be ruled out (endocrinological problems are in the first line).

It has a female preponderance with a female to male ratio of 3:1, and this is not just true for our population but also worldwide as is shown in many studies.

The vast majority of our patients were nonsmoker and so far smoking was approved by several studies to interfere with acne pathophysiology *(study done in 2014 in France)*[5].

Concerning the acne profile, this multifactorial inflammation of the pilosebaceous unit can affect different parts of the body with preponderance over the face, followed by the back, chest, extremities and finally the neck. These results are well supported by previous studies that showed a higher prevalence over the face and less commonly over the neck (figure 10).
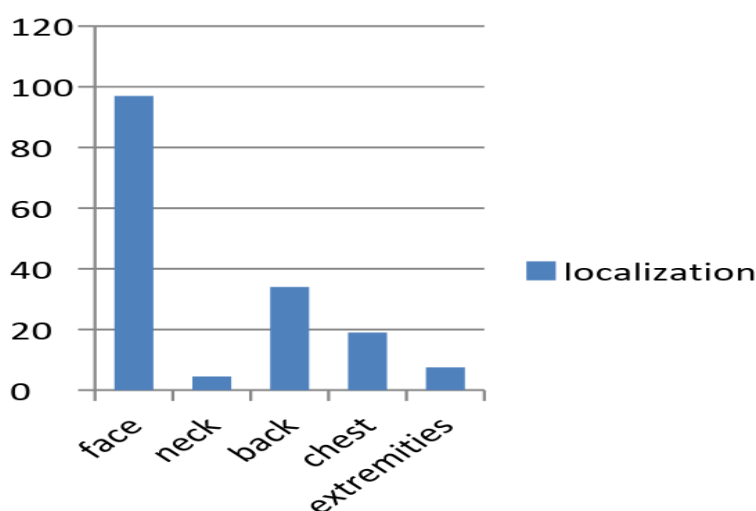
Figure 1: localization of acne.

The comedogenic type was the most common, responsible for 27% of cases.

The nodular type was the most severe one and the most difficult to treat (figure 11).

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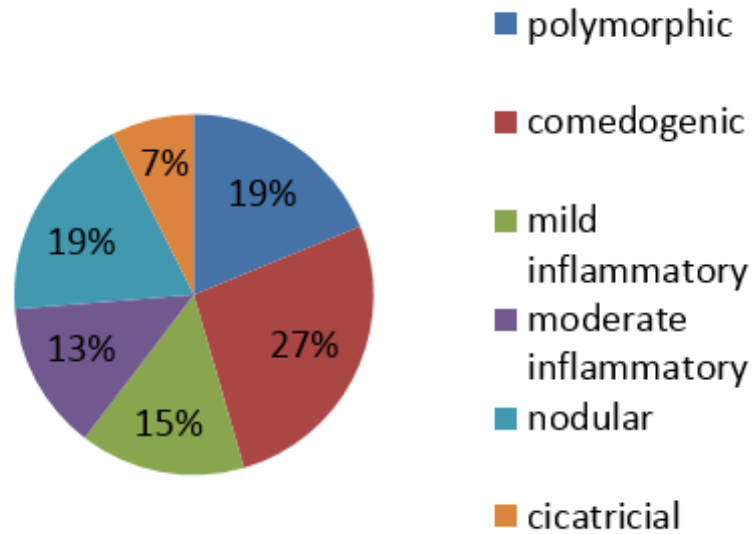
Figure 2: The different types of acne.

(This figure shows that the comedogenic type was the most prevalent, the nodular and the polymorphic types were present equally, the cicatricial type was the least prevalent).

Defining acne profile is an essential step while examining a patient having acne because it is not a disease limited to the skin, it is a disease that will adversely affect the quality of life and thus leaving a physical and an emotional scar.

Concerning predisposing factors, multiple risk factors have been implicated or thought to be implicated in the pathophysiology of acne, as it is shown in the following table:

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Table 1. Risk Factors

Predisposing factor	Percentage (%)
Diet	85.5
-Chocolate	30.5
-Slim milk	21
-Soft drink	18
-Spicy food	15.5
Family history	44.5
Cosmetics	16.5
Medication	15.5
Endocrinologic factors	10.5
Hair cosmetics	7.5

-Family history: 44 % of our patient had a family history of acne and thus a genetic predisposition can be implicated.

-Genetic background: several studies have shown that genetic background may interfere with the onset of acne.

One of these studies indicates that the cutaneous androgen metabolism-regulated genes *HSD3B1* and *HSD17B3* increase the susceptibility to acne vulgaris in Han Chinese from Southwest China. The haplotype AAT in HSD3B1 and the haplotype in H8 *HSD17B3* were significantly associated with an increased risk of acne vulgaris [6].

Another factor is the extracellular matrix (ECM) remodeling: The remodeling of the ECM is regulated by a balance between matrix metalloproteinases (MMPs) and their inhibitors called tissue inhibitors of metalloproteinases (TIMPs). One study investigated the potential association between MMP-2 (-1306 C/T) and TIMP-2 (-418 G/C) polymorphisms and the risk for acne in a Turkish population. It concluded that the TIMP-2 (-418 CC) genotype increases the tendency to develop acne vulgaris by disrupting the balance between MMPs and TIMPs [7].

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Also a meta-analysis published in 2014 suggests that the -308 G/A polymorphism in the TNF gene contributes to acne vulgaris risk, especially in Caucasian population [8].

-Diet: years and years ago, diet was implicated in the acne pathophysiology with higher prevalence to the insulinogenic food (chocolate, carbohydrates…). Spices and fatty food were also suggested.

A double-blind study was done in 2014 at the University of Miami, Miller school of dermatology and showed that chocolate consumption in male patients correlates with an increase in acne exacerbation after ingestion of chocolate [9]. One study published in the journal of dermatology found that acne patients were frequently having abnormal plasma lipid profile [10], another one showed an association between low high-density lipoprotein cholesterol levels and postadolescent acne [11].

The association between diet and acne has been highly controversial in dermatological practice and research history, for this reason we find in literature a lot of associations between many food and acne for example one study showed that sunflower seed appears to aggravate acne vulgaris [12].

-Endocrinologic problems: Cushing disease, POS... have been found to cause acne in an older age group.

-Hormonal therapy also was among those risk factors and was supported by our study.

Concerning the treatment, the choice of therapy depends on the type of the acne and its severity. Many drugs are available, as topical and as systemic drugs. Topical antibiotics and benzoyl peroxide were effective in mild acne, oral antibiotics with or without topical treatment were effective in moderate acne, in refractory and complicated type (with scar formation) isotretinoin was the drug of choice.

While taking any regimen, it is essential to monitor side effects: liver function and fertility with systemic isotretinoin, photosensitivity with benzoyl peroxide, skin irritation with topical tretinoin, and many other side effects.

To note that each medication had a lot of side effects for example one prospective study showed that isotretinoin had oral adverse effects especially on salivary flow, after 6 months of isotretinoin-treatment, salivary flow and buffer capacity significantly decreased, and the

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International Caries Detection and Assessment System (ICDAS) scores, significantly increased[13].

One of the latest articles published in 2017 concluded that some changes occur in haematological parameters during isotretinoin therapy, but all of these changes remain within the normal range (platelets increased at the first month of the treatment and then decreased to baseline. White blood cells and neutrophils decreased at the first month, then increased to baseline value at the second month, and were found to be decreasing again at the end of the treatment)[14].

The same management was used in different previous studies with a success rate of 30 % compared to 21 % in our study due to the lack of follow up in a part of our patients.

In conclusion, our study is an epidemiological study targeting a sample of Lebanese population having acne. It shows that this disorder affects mainly young females, with lesions occurring mainly over the face of comedogenic and mild inflammatory types.

In adjunct to propionobacterium acne and the resulting inflammation, many predisposing factors are implicated in its pathogenesis; from these family history and diet are the mostly involved. Defining the acne profile is an important step in the management of this disease: once it is done, treatment will be prescribed and best results will be obtained.

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