

Acne Epidemiology and Socioeconomic Aspects

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Core Messages

- The prevalence of adolescent acne is approximately 80 %, varying among different studies (44.1–94.9 %) partly depending on the method of acne classification or due to differences between populations regarding genetic and/or environmental factors.
- Adult acne seems to have gender differences as to its prevalence, impact on the patient's quality of life, treatment choice, and clinical features.
- The prevalence of female adult acne differs (12–50.9 %) according to the criteria used in different studies.
- Acne may have substantial psychosocial sequelae. It has been shown to negatively affect the patient's quality of life similarly with other chronic disabling diseases, such as asthma, epilepsy, diabetes, and arthritis.
- Even mild acne may have an important negative impact on the patient's quality of life, self-esteem, and psychological well-being, depending on the patient's particular environment (personal, social, and occupational).
- These findings have public health implications because they underline the need of appropriate health care for adolescent and adult acne patients in the community.

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7.1 Introduction

Acne is the most common skin disease and the leading reason for visiting a dermatologist [1]. It affects approximately 50 million people in the USA, with annual costs for health care in acne exceeding \$1 billion in the USA alone [2]. A community-based survey study of acne-related health preferences in adolescents assessed adolescents' acne-related preferences. Adolescents were willing to pay a median of \$275 to never have had acne in their lifetime and were willing to pay significantly more for 100 % clearance than for 50 % clearance or 100 % clearance but with scarring ($p < 0.001$ for both comparisons) [3].

In the past, acne was thought of as a trivial, "normal" condition; however, acne has been recently redefined to be a chronic disease, as for many patients, acne is characterized by a prolonged course, a pattern of recurrence or relapse, manifestation as acute outbreaks or slow onset, and a psychologic and social impact that affects the individual's quality of life [4] (see Chap. 27).

In this chapter, data regarding epidemiology, economics, and psychosocial effects of adolescent and adult acne are presented.

7.2 Adolescent Acne

Acne vulgaris is highly prevalent among teenagers, affecting approximately 80 % of them with similar sex distribution [5]. Most epidemiological acne studies have focused on adolescent age. It has been reported to range from 44.1 % in 1,857 adolescents in Peru [6] and 49.8 % in 317 adolescents in the UK to 67.3 % in 9,570 adolescents in New Zealand [7], 82.1 % in 1,290 adolescents in Portugal [8], 83.1 % in 666 adolescents in Australia [9], 87.9 % in 1,045 adolescents in Singapore [10], 91.3 % in 522 adolescents in China (Hong Kong) [11], and 94.9 % in 594 adolescents in Belgium [12].

A cross-sectional, community-based study in Tehran, Iran, of 1,002 pupils aged 16 ± 0.9 years showed an overall acne prevalence of 93.3, with 94.4 % rates for boys and 92.0 % for girls. Moderate to severe acne was observed in 14 %. No association between gender and acne severity

was detected. Moderate to severe acne was significantly more prevalent in pupils with a positive family history of acne ($p < 0.0005$, OR: 2.3). Also, risk factors for moderate to severe acne were increasing pubertal age, seborrhea, the premenstrual phase, mental stress, and sweet and fatty foods [13].

The prevalence of adolescent acne in different studies varies partly depending on the method of acne classification or due to differences between populations regarding genetic and/or environmental factors (see Chaps. 20, 21, 25, 26). The low acne prevalence in Peruvian adolescents (44.1 % in 1,857 adolescents) [6] might be attributed to distinct nutrition patterns or genetic predisposition [14]. The importance of genetic factors in acne susceptibility is suggested by genetic and ethnic studies and is confirmed by the very high degree of concordance between identical twins (see Chap. 14) [15].

In adolescents, acne can affect self-image, psychological well-being, feelings, personal relationships, sports, social life, and may even precipitate suicide [16]. It has been suggested that it is important to identify adolescents that are affected by their acne early to reduce the future socioeconomic burden of their disease [5]. Acne patients ($n = 111$) reported levels of social, psychological, and emotional problems as great as those reported by patients with long-standing disabling diseases, including asthma, epilepsy, diabetes, and arthritis. These findings underline the importance of appropriate management of the acne patient. In this study, quality of life was measured using the Dermatology Life Quality Index (DLQI), Rosenberg's measure of self-esteem, a version of the General Health Questionnaire (GHQ-28), and the Short Form 36 (SF-36). Of note, the deficits found in all quality of life measurements did not correlate with the clinically assessed acne severity, implying that even mild acne may have an important negative impact on the patient's quality of life, self-esteem, and psychological well-being, depending on the patient's particular environment (personal, social, and occupational) [17].

In a questionnaire-based survey of 3,775 late adolescents (18 years old) in Norway, the prevalence of acne was 13 % for girls and 14 % for

boys. For both sexes, acne explained a low sense of pride for girls (OR 1.54 [1.06; 2.24]) and for boys (OR 1.85 [1.18; 2.89]) and poor body image for girls (OR 1.56 [1.11; 2.20]) and for boys (OR 1.66 [1.08; 2.54]) independently of body mass index and depressive symptoms. Only boys showed lower self-attitude because of acne (OR 2.07 [1.10; 3.88]) and only girls showed lower self-worth because of acne (OR 1.88 [1.23; 2.88]) [18].

A recent cross-sectional, questionnaire-based study among 3,775 adolescents aged 18–19 years showed substantial acne in 14 %. Suicidal ideation was noted significantly more often by those with increasingly severe acne (p -value for trend <0.01). Suicidal ideation remained significantly associated with substantial acne (odds ratio 1.80, 95 % CI: 1.30–2.50) in a multivariate model including adjustments of symptoms of depression, ethnicity, and family income. Mental health problems, as assessed by the Strengths and Difficulties Questionnaire (2.25, 1.69–3.00), low attachment to friends (1.52, 1.21–1.91), not thriving at school (1.41, 1.12–1.78), never having had a romantic relationship (1.35, 1.05–1.70), and never having had sexual intercourse (1.51, 1.21–1.89) were all associated with substantial acne in a multivariate model [16].

On the other hand, the impact of acne on daily life significantly correlated with its perceived severity ($n=711$) in a French study of young people (12–15 years old) who called a general youth helpline. Severe acne was reported to be a problem in daily life, to affect relations with friends and boy/girlfriend, and to affect leisure. Also, severe acne was perceived as a very important problem [19]. A 12-month cohort study of 209 high-school students did not find an association of the presence of acne with examined measures of psychological and psychiatric morbidity [20].

7.3 Adult Acne

Acne in adulthood affects the patient's quality of life and employment chances, with acne patients having a higher unemployment rate than adults without acne [21]. Studies regarding the epidemiology and psychosocial effects of adult acne have

included university students and other young adults, while others have focused on female adult patients. The prevalence of adult acne has been reported to be 56.2 % in a study of Saudi medical students [22]. The prevalence of acne was 50.9 % for men and 42.5 % for female nonuniversity young adults in their 20s [23].

A study of 98 medical students (22–35 years old) in Portugal reported a prevalence of acne of 62.2 %. In this study, the prevalence of acne was not significantly associated with gender, family history of acne, smoking, or self-perceived presence of acne. Menstrual regularity was not associated with the presence of female acne. The most important patient-reported causes of acne were hormonal changes (94.9 %), diet (85.7 %), genetic problems (69.4 %), poor skin hygiene (61.2 %), and infections (50 %). The majority thought that acne strongly affects self-image and, to a much lesser extent, personal relationships, academic performance, or recruitment to a job [24].

The prevalence of female adult acne differs according to the criteria used in different studies. In the UK, 18.4 % of 200 adult acne patients (older than 25 years old) were females [25], and in another study of 749 adults, clinical facial acne (grade >0.75) was recorded in 3 % of men and in 12 % of women ($p<0.01$) [26]. Another study in the UK showed that 14 % of women 26–44 years old had acne [27]. An Australian study of 787 adult women showed that 13.6 % had acne [28]. In France, a questionnaire-based study of 3,305 adult women showed that 41 % had late-onset acne [29]. A USA questionnaire-based study reported that among 1,013 individuals aged 30–60 years old, the reported prevalence of acne in women aged 20–29 years old was 50.9 % [30].

Adult acne seems to have gender differences as to its prevalence, impact on the patient's quality of life, treatment choice, and clinical features. A cross-sectional and longitudinal questionnaire study of 60 adult acne patients showed that patients with acne experienced functioning and emotional effects from their skin disease comparable with those of patients with psoriasis. Also, older adults reported more effects of acne on their quality of life than younger adults [21]. It has been suggested that after the teenaged years, women seem to be

more likely to have acne than men [26, 30]. Gender differences in self-reported quality of life of the patient and treatment choice were evaluated in a retrospective study of 211 acne patients (mean age: 21.6 years). Men had significantly more severe acne when compared to women; however, women scored worse in the DLQI than men, indicating a greater impact of acne in their quality of life. Also, there was a significant gender difference in treatment choice as more women were treated with oral isotretinoin, although most of them had moderate acne and the DLQI was not known to the treating dermatologist [31]. Recently, the patient's perspective of his disease has started to be incorporated in the decision making by the clinician in a plethora of skin diseases. Taking into account the particular characteristics of the acne patients, such as gender and impact of acne on his/her quality of life as perceived by the individual patient, may be valuable parameters to incorporate in the treatment approach.

In a study of 89 female acne patients, the acne that developed after the age of 21 showed different clinical features compared with the acne that developed before the age of 21 year, with patients with acne after 21 years of age having significantly less comedones and total number of acne lesions. There were no significant differences in the fluorescence density of *P. acnes* or sebum secretion between the two groups [32]. On the other hand, another study of 226 adult women (25–50 years old) reported comedonal postadolescent acne (CPAA) in the majority of patients (85 %) and inflammatory acne in the remaining 15 %. In this study CPAA was significantly associated with smoking [33] (see Chaps. 21, 32).

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