

Acne Vulgaris in the United States: A Descriptive Epidemiology

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While acne vulgaris is a common skin disease, many misconceptions still exist. The purpose of this study is to provide epidemiologic data to accurately describe the US population affected with acne and its associated comorbidities. Patient information was obtained from a third-party database of administrative claims from more than 80 public and private healthcare plans, representing approximately 9.6 million unique patients, and analyzed using the Total Resource Utilization Benchmarks™ process. Benchmarks in this study included sex, age, comorbidities, medication, and cost. Nearly two-thirds of visits were made by females (65.2%). Teenagers (age range, 12–17 years) comprised only 36.5% of patients with acne, while patients 18 years or older comprised 61.9%. Depression was reported in 10.6% of females with acne. The average total episode cost across all age groups was determined to be \$689.06, with a range of \$361.25 (age range, 0–11 years) to \$869.06 (age range, 15–17 years). The older patients (age 65+ years) more often were prescribed different medications than younger individuals.

This analysis only included patients who sought treatment of their acne and may underestimate the total prevalence of acne in the population. Acne is a disease that affects all age groups, not just adolescents. Differences in age are associated with differences in pharmaceutical treatment as well as total healthcare utilization. Depression is a substantial comorbidity and patients seeking treatment of acne should be screened for depression.

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Acne is a common multifactorial skin condition that affects a large portion of the population. Acne traditionally has been considered a disease of adolescence because of its nearly universal prevalence in the teenaged years. Approximately 95% to 100% of adolescent boys and 83% to 85% of adolescent girls aged 16 to 17 years are affected by this condition.¹ Acne tends to resolve in the majority of patients by the third decade of life; however, up to 20% of adolescents can have acne that persists into adulthood, with a majority of these patients being female. One study shows that at 40 years of age, 1% of men and 5% of women have acne lesions.² Although it is commonly understood that adolescents have a high prevalence of acne, it may actually be more prevalent in adulthood than previously believed.

The psychosocial impact is the most recognized comorbidity associated with acne. In many cases, it is the most disabling element of the disease. Symptoms of depression in patients with acne are caused by perceptions of self-image. Treatment of disfiguring acne has been shown to reduce depression and other psychiatric symptoms.³ Lack of treatment during adolescence, however, can lead to continued psychiatric symptoms, even after eventual improvement in adulthood.⁴

Other psychiatric comorbidities of acne include eating disorders; there is a high prevalence of acne in

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patients with anorexia nervosa and bulimia nervosa.⁵ Four major factors have been proposed to explain this correlation: obsession with self-image, acne as a sign of sexual maturity, folklore of specific foods associated with acne, and food restriction causing decreased levels of androgen.⁶ It is important to consider the psychosocial aspects of acne during treatment because of the life-threatening risks associated with severe depression and restrictive diets.

In this study, we examine epidemiologic information such as sex, age, and comorbid conditions associated with acne. A better awareness of the demographics affected by this condition can lead to important changes in patient education and treatment. Additionally, it is useful for physicians to be aware of comorbidities associated with acne to fully and successfully treat patients.

Another aim of this study is to examine claims data from a broad range of private healthcare data plans to determine any differences in treatment type and cost in different age groups. These data are used to determine discrepancies in pharmaceutical treatment options based on age for patients with acne. This study does not seek to establish any causal relationships associated with the problem but merely to discover and describe possible differences. This study examines the health claims data and attempts to quantify the most commonly prescribed medications in each age group as well as the overall cost to patients including inpatient services, outpatient services, emergency care, and pharmacy costs.

It is assumed that through evidence-based practice decisions, clinicians will be able to identify and apply the most efficacious treatment options to maximize the quality of life for individual patients, and patients will receive effective treatments. Establishing possible differences in treatment options in a population can support the evidence-based practice guidelines to treat all demographics indiscriminately. The primary benefit of evidence-based practice is improved care, which consistently improves outcomes and, in most cases, also reduces cost. Evidence-based medicine can lead to evidence-based healthcare, under which evidence-based medicine principles would be applied to all professions associated with healthcare. As a result, money ultimately would be spent more efficiently to improve patient health.

Methods

Patient-specific information was obtained from the PharMetrics® Integrated Database, a large collection of administrative medical claims in the United States. The PharMetrics database contains enrollment data as well as pharmacy and medical claims from more than 85 different managed care

organizations consisting of more than 55 million individuals in the United States. The database is geographically diverse and is considered to be representative of the commercially insured population in the United States. New information from contributing plans is accepted as frequently as every month and all data undergo quality assurance checks. Before inclusion, each new data submission is compared to expected values for the data fields based on the complete production database. New data submissions with unexplained variances or identified problems are excluded from the database.^{7,8}

At the time of this analysis in 2004, there were more than 80 public and private healthcare plans included in the database, representing approximately 9.6 million unique patients. Analysis was performed using the Total Resource Utilization Benchmarks™ process. This method organizes and separates information from a third-party database into accessible benchmarks for comparison, including demographics, disease severity, comorbidities, pharmacotherapy, and cost involved in different categories of healthcare services. Specific benchmarks used in our analysis of patients with acne included sex, age, comorbidities, medication, and cost. Cost was determined by combining claims from inpatient services, outpatient services, emergency care, and pharmacy costs.

Approval for this study was provided by the Wake Forest University School of Medicine Institutional Review Board.

Results

At the time of this analysis in 2004, there were more than 80 public and private healthcare plans included in the database, representing approximately 9.6 million unique patients.

Sex—In 2004, the majority of patients treated for acne were female (Figure 1). Of all the patient visits in the database, 65.2% were females, which corresponds to a female to male ratio of 1.9 to 1 for patients seeking treatment of acne. Related comorbidities also varied by sex (Figure 2).

Age—Patients of all ages were seen for evaluation and treatment of acne (Figure 3). The average age of all patients in this database was 25 years. The most represented age group was patients aged 15 to 17 years, which comprised 25.3% of all patients. Adolescents (age range, 12–17 years) comprised only 36.5% of all patients with acne, while patients 18 years or older comprised 61.9%. Preadolescents (age range, 0–11 years) and older patients (age 65+ years) comprised only 1.6% and 0.5% of all patients, respectively.

Figure 1. Patients with acne distributed by sex. At the time of this analysis in 2004, more than 80 public and private healthcare plans were included in the database, representing approximately 9.6 million unique patients. Approximately twice as many females sought medical attention for their acne in 2004 (65.2% female vs 34.8% male).

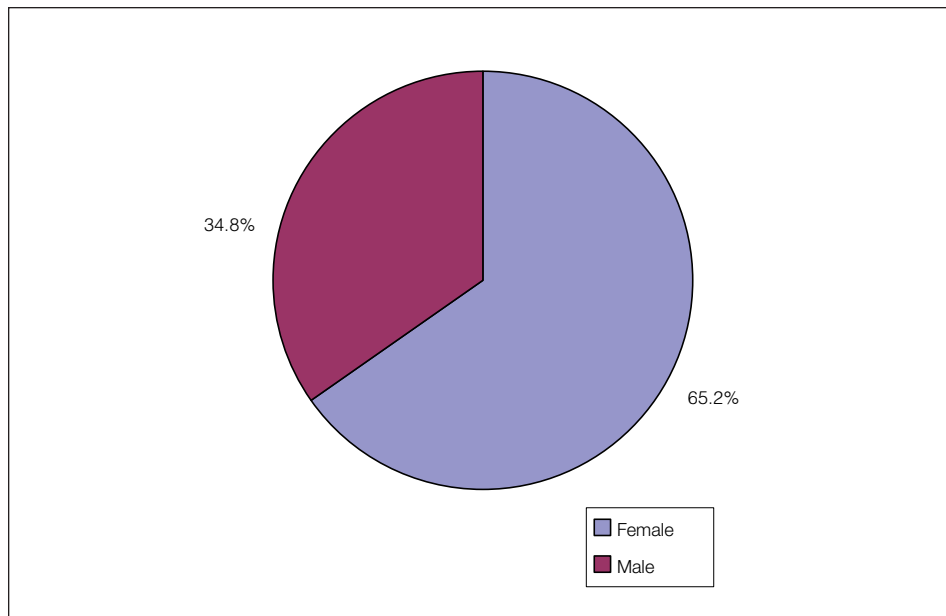
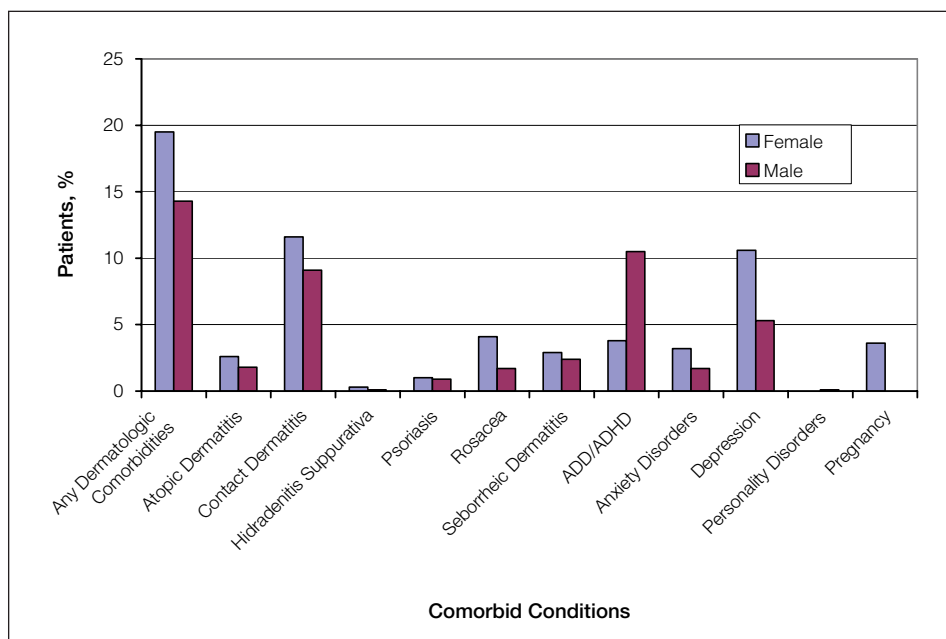


Figure 2. Comorbid conditions in patients with acne distributed by sex. At the time of this analysis in 2004, more than 80 public and private healthcare plans were included in the database, representing approximately 9.6 million unique patients. Approximately twice as many females with acne were affected by depression (10.6% female vs 5.3% male). ADD indicates attention deficit disorder; ADHD, attention-deficit/hyperactivity disorder.



Comorbidities—The most common comorbidities associated with acne included any dermatologic comorbidities (17.7%), contact dermatitis (10.7%), depression (8.8%), attention deficit disorder and attention-deficit/hyperactivity disorder (6.1%), and rosacea (3.3%)(Figure 4). All comorbid conditions were more common in females, except attention deficit disorder and attention-deficit/hyperactivity disorder, and personality disorders (Figure 2). Depression was twice as common in females as males (10.6% vs 5.3%).

Medication—Upon analysis of the data, it was determined that specific medication classes were

used more often than most. The most commonly prescribed medications were new-generation retinoid products, benzoyl peroxide-based combination products, prescription topical corticosteroids, topical antibiotics, common topical retinoid products, and oral antibiotics, including brand names such as clindamycin 1%–benzoyl peroxide 5% gel (BenzaClin® and Duac®), adapalene gel 0.1% (Differin®), adapalene cream 0.1% (Differin), and tretinoin microsphere gel (Retin-A Micro®).

In general, acne medications were utilized most often in patients aged 12 to 14 years, with BenzaClin being the most popular medication prescribed

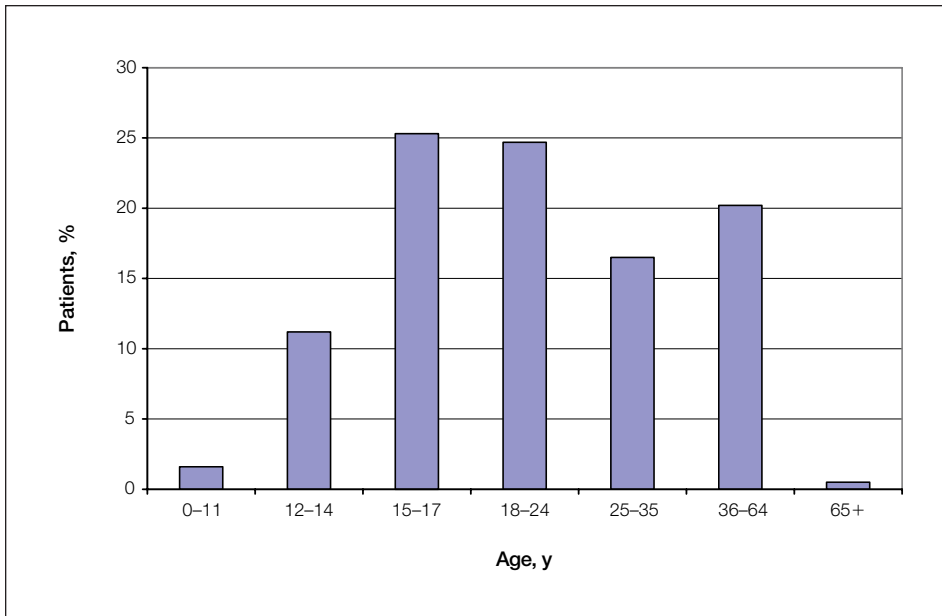


Figure 3. Age groups affected by acne. It is commonly thought that acne primarily affects teenagers. However, data collected indicated that 61.9% of patients with acne are 18 years or older. At the time of this analysis in 2004, more than 80 public and private healthcare plans were included in the database, representing approximately 9.6 million unique patients.

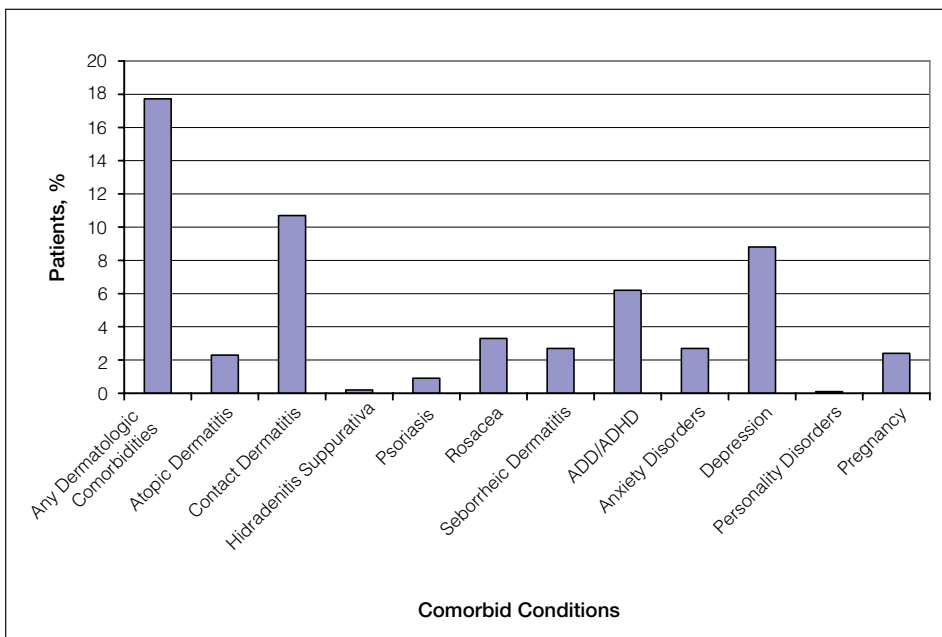


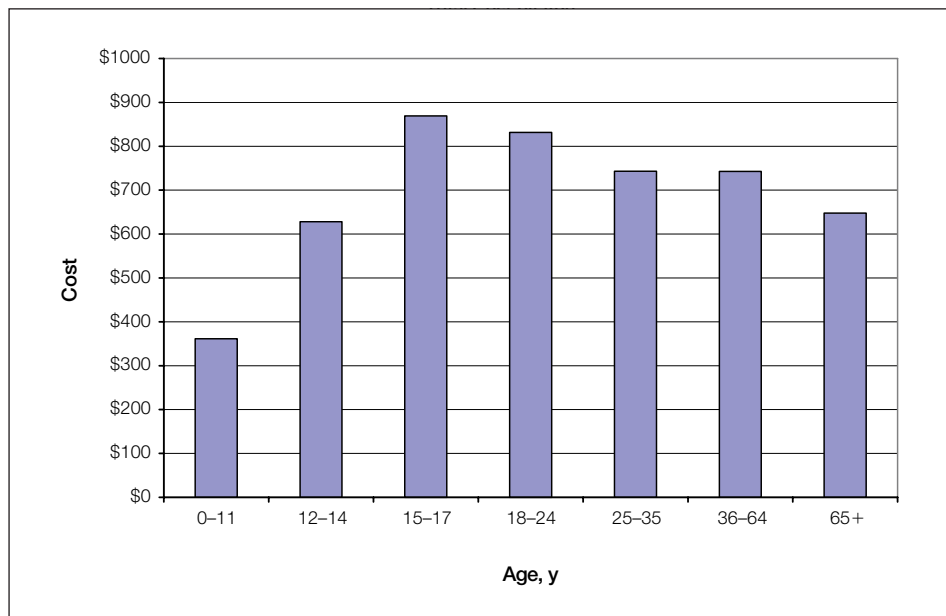
Figure 4. Comorbid conditions reported in patients with acne. While these data cannot determine a direct cause and effect relationship, it is not surprising that depression was found in at least 8.8% of patients with acne. At the time of this analysis in 2004, more than 80 public and private healthcare plans were included in the database, representing approximately 9.6 million unique patients. ADD indicates attention deficit disorder; ADHD, attention-deficit/hyperactivity disorder.

in patients aged 15 to 17 years. Acne medications are utilized least often in patients 65 years and older, with different medications being used in this age group more frequently than any other, such as clindamycin phosphate lotion and solution (Cleocin T[®]), adapalene cream 0.1% (Differin), tazarotene cream 0.1% (Tazorac[®]), and topical antibiotic products.

Cost—Costs were defined as all charges submitted or billed to the healthcare provider or insurance company for payment. Total episode costs included inpatient services, outpatient services, emergency care, and pharmacy costs for individuals.

The average total episode cost across all age groups was determined to be \$689.06, with a range of \$361.25 (age range, 0–11 years) to \$869.06 (age range, 15–17 years)(Figure 5). The average total episode cost was determined to be the lowest in the youngest patients (age range, 0–11 years), peaked in adolescent patients (age range, 15–17 years), and then decreased in patients older than 24 years. The lowest average total episode cost was found in patients aged 0 to 11 years (\$361.25). The highest average total episode cost was found in patients aged 15 to 17 years (\$869.06), with a slightly lower cost in patients aged 18 to 24 years (\$831.56). Patients

Figure 5. Total cost of acne by age group. Episodes included all inpatient services, outpatient services, emergency care, and pharmacy costs for individuals. The highest cost was observed in patients aged 15 to 17 years (\$869.06) and the lowest cost in patients aged 0 to 11 years (\$361.25). Total costs decreased with age in adulthood.



aged 15 to 17 years also showed the highest average pharmacy cost at \$575.01, with a slightly lower cost in patients aged 18 to 24 years (\$531.42). After 24 years of age, average total episode costs decreased with age, while average outpatient costs increased with age. Total cost per episode of care in patients 65 years and older was higher than all ages up to 14 years of age.

Comment

Acne is an extremely common disease that affects most of the population at some point. Acne should no longer be considered a disease restricted to adolescents. A substantial portion of the population experiences this condition in adulthood, indicating that a paradigm shift may be necessary to change the way primary care physicians and specialists approach this disease. Approximately one-third of all patients seen in the office for treatment of acne are 25 years or older.⁹ Many of these patients have persistent acne, which may be more difficult to treat because of bacterial resistance.¹⁰ It is possible that the prevalence of acne in adulthood is due to undertreated acne in adolescence or new-onset acne in adulthood. One study showed that pediatricians use topical retinoids, a key first-line agent, less frequently than dermatologists when treating the same age group (age range, 10–18 years).¹¹

Sex differences are immediately apparent in the percentage of office visits for the treatment of acne, with nearly two-thirds by females. However, one study has shown that there is a slightly higher male prevalence of disease (29.9% vs 23.7%),¹² which could suggest that there is a large portion of

adolescent boys who fail to obtain treatment of acne. Social factors, such as commercial advertisement targeted toward females, may account for the difference in patients seeking clinical consultation. Further investigation into the discrepancy of acne prevalence and acne treatment between the sexes could elucidate an explanation of this phenomenon.

Depression is a common comorbidity seen in patients with acne, but it is questionable if acne is the precipitating factor. No correlation exists between severity of acne and degree of psychiatric symptoms. Patients with mild to moderate acne can have psychiatric symptoms as severe as those with severe nodulocystic acne.⁶ Nonetheless, it is important to be aware and recognize that patients with acne have an increased chance of experiencing depression and that these comorbidities need to be addressed. Better screening of psychiatric symptoms may need to be implemented into routine evaluations to limit psychiatric complications.

There are several different options for the treatment of acne. Examining how these treatments are used in different subsets of patients will give physicians a more accurate insight into the best possible treatment method. This study does not determine causal relationships in the differences in treatment option preferences but merely describes the discrepancies.

Evidence-based medicine is vital in the future state of managed care. Healthcare plans are continuing to transition from managed utilization to evidence-based care management. The primary benefit in the adaption of evidence-based practice

guidelines is improved care, which has been highly associated with improved outcomes and reduced costs. Healthcare organizations can promote the use of evidence-based medicine by distributing benchmark data, which aids in the creation of clinical guidelines. A higher standard of care for the treatment of acne can improve the quality of care by reducing both direct and indirect healthcare costs.

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