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ORIGINAL ARTICLE

Psychosocial Aspects of Acne Vulgaris: A Community-based Study with Korean Adolescents

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Background: Acne vulgaris is a distressing condition that affects the majority of adolescents, but the impact of acne vulgaris on the psychological aspects in this age group is poorly understood. **Objective:** The purpose of this study was to determine the prevalence of acne, and the level of emotional, social, and functional impairments among Korean adolescents with acne. **Methods:** Five hundred four middle school students (13～16 years) participated. The severity of acne was graded by visual examination using the Korean Acne Grading System. Self-reported questionnaires, including subjective acne severity rating, the Self Image Questionnaire, the Rosenberg Self-Esteem Questionnaire, the Index of Peer Relations, and the Beck Depression Inventory were used to assess psychologic status. **Results:** There was a prevalence of acne in 78.9% of the study samples, with 10.2% of students having moderate-to-severe acne. Acne was more prevalent and severe in boys than girls. Participants with severe acne and girls had higher levels of emotional and social impairments. The longer the acne persisted, the more stress the students felt. The degree of stress and extent of self-image impairment were related to subjective severity more than objective grading. **Conclusion:** Acne is a common disorder among Korean adolescents and appears to have a considerable impact on mental health. Dermatologists should be aware of the importance of basic psychosomatic treatment in conjunction with early medical, educational intervention in the management of acne. **(Ann Dermatol 21(2) 125～129, 2009)**

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Acne vulgaris, Adolescents, Psychological stress, Psychosocial aspects

INTRODUCTION

Acne is a common inflammatory dermatosis which most frequently affects the face during adolescence[1]. Although acne does not cause direct physical impairment, it can produce a significant psychosocial burden[2]. It has been suggested that patients with moderate-to-severe acne suffer from poor body image, low self-esteem, and experience social isolation and constriction of activities[3,4]. As part of the emotional impact, increased levels of anxiety, anger, depression, and frustration are also observed in patients with acne[5]. Given the fact that acne causes psychologic suffering, acne can affect social, vocational, and academic performance of teenagers.

The majority of studies on the psychosocial impact of acne have been conducted among patient groups in the US and Europe[2,5-7]. The purpose of the present study was to determine the prevalence of acne with an objective acne grading scale, and to evaluate the levels of emotional, social, and functional impairment among Korean adolescents with acne using age-appropriate and well-validated generic measures of psychiatric status. To prove effective clinical care with adjunctive psychotherapy is thought to be mandatory for maintenance or restoration of psychological well-being, and some of the psychological effects can be reversed by effective clinical intervention with psychological encouragement[8]. It is thus essential to uncover those at risk of experiencing a psychologic problem and to identify variables predicting this impairment.

MATERIALS AND METHODS

Subjects and methods

Five hundred thirteen students, 13～16 years of age, were recruited in this cross-sectional survey from 1 middle school located in Seodaemun-gu, City of Seoul in May 2007.

All students underwent a clinical examination by two dermatologists. The severity of acne was assessed using the Korean Acne Grading System (KAGS), proposed by the consensus conference in 2004[9]. The severity score (grades 1～6) was as follows: grade 1, ＜10 papules; grade 2, 11～30 papules; grade 3, ＞31 papules and ＜10 nodules; grade 4, 11～20 nodules; grade 5, 21～30 nodules; and grade 6, ＞ 31 nodules (Fig. 1).

The self-reported questionnaires included a subjective acne severity rating, self-perceived stress, and interpersonal relations and disturbances in daily life (none /mild /moderate /severe /very severe). When students were asked to complete the questionnaires, those replying that each item had been ＞ severe were defined as having a high-score status. High-score frequencies were expressed as the number of affected students per total persons.

Four measures of psychometric evaluation were applied to assess specific psychosocial impairments, which were as follows: (i) Self Image Questionnaire (SIQ), developed by the Korean psychologist, Song (1983) and revised by Han (1992)[10]; (ii) Rosenberg Self-Esteem Questionnaire (SEQ)[11]; (iii) Index of Peer Relations (IPR)[12]; and (iv) Beck Depression Inventory (BDI)[13]. The SIQ consists of a 116 item questionnaire generating 6 factor scores, which focused on general self, educational goals and achievement, social relations, familial relationships, and emotional self and body image. In the Rosenberg SEQ test, the responses to 10 items were rated on a 4-point scale (strongly disagree to strongly agree), yielding scores between 10 and 40, with higher scores indicating higher self-esteem[11]. The IPR reflected problems in peer relationships. With 7-rated 25 items, a score ＞35 indicated a significant problem with peer relations[12]. The BDI is a reliable and easy-to-use screening instrument and has received worldwide application in both psychiatric and non-psychiatric patient populations. Each item contains 4 statements, scored 0～3, indicating an increasing symptom severity, and total scores ranging from 0～63. The cut-off scores were defined as follows: (i) ≥10, mild symptoms of depression; (ii) ≥19, moderate symptoms of depression; and (iii) ≥30, severe symptoms of depression[13]. The subjects who scored ＞30 on the BDI evaluation were considered to have severe depression or suicide thoughts and excluded from this study.

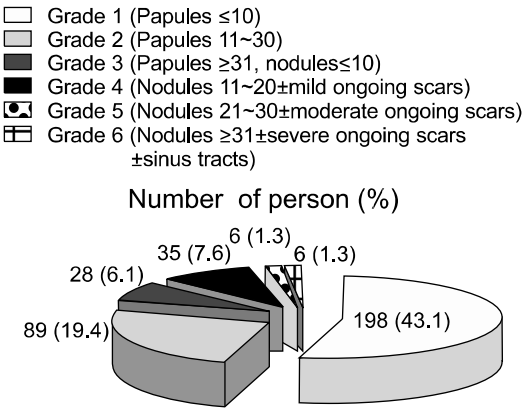

Fig. 1. Objective acne severity scoring by the Korean Acne Grading System (total number of students: 459).

Statistics

Data were analyzed with a t-test to compare the psychosocial index for gender and the presence of acne. To correlate between disease duration, severity, and the psychosocial index, a Pearson product-moment correlation was used with SPSS version 13.0 (SPSS Inc., Chicago, IL, USA). A probability level of ＜0.05 was considered significant. All *p*-values were two-sided.

RESULTS

Among 513 students, 504 students, 13～16 years of age, including 253 boys (50.2%) and 251 girls (49.8%), completed the psychosocial index questionnaires and clinical examination. From the objective analysis (KAGS), 78.9% of the students had acne (220 boys (55.3%) and 178 girls (44.7%)), and 10.2% of students had severe acne beyond grade 4 (Fig. 1). Boys were more likely to have severe acne than girls (grade 2.07 vs. 2.04, $p<0.05$). The mean age of onset was 13.9 years (mean age of boys, 14.2 years; mean age of girls, 13.7 years), and 7.6% reported

Table 1. The number of students (frequencies %) with the high-score (＞severe) psychosocial impairments induced by acne

	Number of students (%)	t-value
Self-perceived acne severity	60 (12.2)	
Self-perceived stress	68 (13.8)	−7.706*
Self-reported disturbances in interpersonal relations	43 (8.7)	−4.908*
Self-reported disturbances in daily life	32 (6.4)	−4.519*

*Correlation is significant at the 0.05 level (2-tailed)

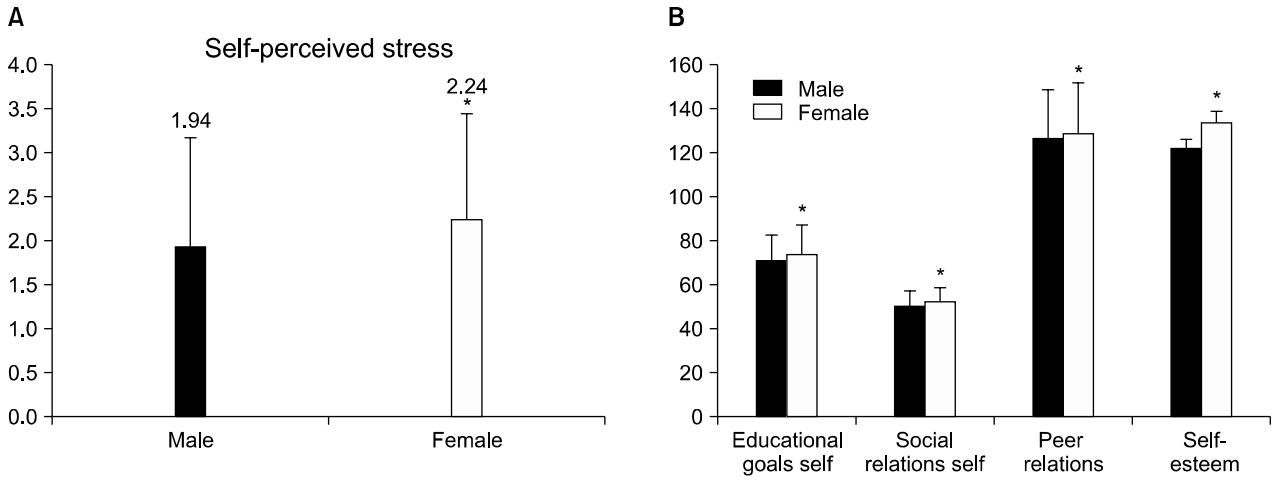

Fig. 2. Comparison of the psychosocial impairment scores by gender, regarding (A) self-perceived stress, (B) educational goals, social relations, peer relations, and self-esteem by gender. *p-value<0.05 (2-tailed).

Table 2. Correlation coefficient between disease duration and psychosocial impairments

	Correlation coefficient by disease duration	p-value
Self-perceived stress	.159	<0.01
Self-reported interpersonal relations	.198	<0.01
Self-reported disturbances in daily life	.130	<0.01
Depression	.111	<0.05
Educational goals	.001	ns
Social relations	−.070	ns
Family relationships	−.027	ns
Emotional self	−.013	ns
Body image	−.069	ns
Peer relations	.049	ns
Self-esteem	.070	ns

ns: not significant

Table 3. Correlation coefficient between objective/subjective acne severity and psychosocial impairments

	KAGS (objective severity)	Self-reported questionnaire (subjective severity)
Self-perceived stress	.406†	.650†
Self-reported interpersonal relations	.333†	.443†
Self-reported disturbances in daily life	.322†	.429†
General self-image	−.014	−.126†
Educational goals (self-image)	−.022	−.084
Social relations (self-image)	−.085	−.118†
Family relationships (self-image)	−.015	−.048
Emotional self	.023	−.110*
Body image	.010	−.104*
Peer relations	−.023	−.080
Self-esteem	−.068	−.108*
Depression	.029	.120†

*Correlation is significant at the 0.05 level (2-tailed), †Correlation is significant at the 0.01 level (2-tailed)

having a history of medical treatment.

On the self-perceived subjective acne severity rating, 60 students (12.2%; 26 boys and 34 girls) reported having 'problem acne' (high-score status). Table 1 shows that the quality of life impairment in teenage students could be caused by the presence of acne. From the self-reported questionnaire, high-score self-perceived stress was reported by 68 students (13.8%), impairment in interpersonal relationships by 43 students (8.7%), and disturbance in daily life, especially in academic performance, by 32 students (6.4%).

Separate analysis of self-reported questionnaires by gender (Fig. 2) showed that scores were worse for girls than for boys with respect to several factors, including self-perceived stress, educational goals, social relations, peer relations, and self-esteem ($p<0.05$).

According to the duration of acne, the younger acne began, the more stress students felt regarding the impairments in interpersonal relations and disturbances in daily life. Depression scores were also significantly increased in long-persisted acne group ($p<0.05$; Table 2).

In comparing the psychometric variables with each objective and subjective acne grade of severity, the degree of stress and extent of self-image impairment were related more directly to the subjective grade of acne severity than to the objective grade of acne grading (KAGS). General self-image, social relationships, and depression were significantly correlated with the subjective grade of severity

(scores of self-reported questionnaires), although these variables did not correlate with the KAGS. Additionally, neither objective nor subjective severities showed significant relationships with educational goals, peer relationships, and family relationships (Table 3).

DISCUSSION

Acne has been found to be associated with mental health symptoms in the previous studies. Kilkenny et al[14] conducted a computerized survey of 2,525 Australian adolescents and found self-rated moderate acne to be associated with an increasing frequency of psychiatric symptoms, as measured by the revised Clinical Interview Schedule. Smithard et al[6] studied 317 students 14～16 years of age in the UK. They measured the severity of acne with the Leeds acne grading technique and emotional/behavioral symptoms with the Strength and Difficulties questionnaire (SDQ), and found that those with acne were more likely to score in the abnormal/borderline range for emotional or behavioral symptoms, with an odds ratio of 1.86 (95% confidence interval, 1.03～3.34). Consistent with our results, high SDQ scores were significantly associated with female gender ($F=27.6$, $p<0.001$) and definite acne ($F=3.9$, $p<0.05$).

Comparison of the prevalence rates between studies are generally hampered by varied methods of acne grading, the wide range of diagnostic criteria, and the population characteristics (e.g., age range and ethnicity)[6,14,15]. The rates of prevalence in the range of 41.7% to 93.3% have been reported in different countries with populations 12～18 years of age. Smithard et al[6] reported that 56% of boys and 45% of girls, 14～16 years of age were affected, whereas other studies reported prevalence rates in ＞90% for males and 80% for females amongst adolescents, and ≥16 years of age using the Leeds Acne Grading Scale[16,17]. Although our results are not directly comparable for the populations 13～16 years of age, the KAGS used for objective scoring in this study reflected clinical and epidemiological characteristics of Korean acne patients. The KAGS has been found to have a high inter- and intra-rater reliability and lesion counting has been acknowledged to be more reliable than global assessments of acne severity[9].

Many new dermatology- or acne-specific questionnaires have recently been developed[6,18,19], and they tend to ask people how and to what extent their skin disease affects them. Although SDQ scores assess emotional and behavioral difficulties in five domains (conduct, hyperactivity, emotional symptoms, peer problems, and prosocial behaviors), this instrument fails to demonstrate specific values and depression scores[6]. Our instruments for measuring psychosocial problems in acne were constructed with four major scales, which included specific values and were considered to be key values of psychosocial aspects. These psychometric evaluations might be used as sensitive and responsive patient-assessed measures in evaluation of psychosocial aspects of other dermatologic diseases.

It has only been in recent years that the psychodermatological literature has begun to address the possibility that acne may have a differential psychological and emotional impact according to gender[19-21]. The differences between male and female scale scores suggest that the psychological impact of acne may be greater for women than it is for men. Our gender difference research also illustrated that girls are likely to experience greater psychological difficulties than boys across a wide range of psychological factors, including self-perceived stress, educational goals, social relations, peer relations, and self-esteem. It is likely that the gender difference observed in this study is due to the different level of cosmetic concern and perception regarding the appearance in relation to gender, thus it may exert differential psychological strain upon girls.

The strength of this study was in the large number of adolescents surveyed from the general population, thus excluding the possibility of referral bias and overestimation of psychometric morbidity with hospital-based data. Until now, all of the studies about psychologic problems of acne in Korea have been performed in the hospital setting[22-26]. Acne measurement by self-reported questionnaire with clinical examination provided more available data about acne prevalence, and subjective and objective severity.

The major limitation of this study was its cross-sectional design. Although the acne status and stressful condition are variable and easily affected by other factors, we did not consider them in the evaluation of data. To demonstrate the influence of such confounding factors, including seasonal variation, difference in pubertal stage, medication, hygiene behavior, and menstrual cycle, a prospective study is needed. In order to overcome other limitations, such as narrow age range and the population of a specific district, our research base needs to be expanded and increased in its methodologic complexity.

Our survey confirmed that acne is a common problem for Korean adolescents, affecting 78.9% of middle school students. The results from this community-based study support findings from research with clinical groups that acne is associated with increased psychological morbidity. Participants with definite acne had significantly high-score self-perceived severity, stress, and disturbances in inter-

personal relationships, daily life, and academic performance. These impairments were significantly associated with long disease duration, female gender, and severity of subjective perception. In parallel with previous findings[25], subjective ratings were more related to self-image, self-esteem, social relations, and depression scores regardless of objective severities. This suggests that the impact of acne can be more serious for the patients than most clinicians think it would be and it is more important to focus on the subjective perception in managing acne patients, irrespective of the objective severity. Using the specifically designed psychometric evaluation, this study suggested the importance of screening for psychosocial problems in those who present for management of acne. It is important for all health service workers to be cautious about psychological morbidity in young people, and especially dermatologists should be aware of the importance of basic psychosomatic treatment in conjunction with medical treatment in the management of acne.

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