

Original Article

Pattern of skin disorders among adolescent female students at Hyderabad, Sindh

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Abstract *Objective* To determine the pattern and severity of skin disorders among female adolescent students at Hyderabad, Sindh, Pakistan.

Patients and methods This observational study was conducted at Hyderabad, Sindh, Pakistan, from August, 2007 to October, 2007. Four intermediate and degree colleges of the Hyderabad city were randomly selected and visited. The students were examined with regard to the type and severity of skin disorders. The findings were recorded on a pre-structured proforma.

Results A total of 1350 students were examined. Their ages ranged from 16-24 years. Acne was the most common disorder seen in 59.5% of subjects followed by hair loss (59%), pigmentary disorders (36.3%), dandruff (26.1), hirsutism (20.9%), ephelides (6.4%), xerosis (2.9%), pityriasis versicolor (2.9%), pruritus (2.3%) and eczema (2.1%). There were very few cases of pyoderma, tinea corporis and scabies.

Conclusion Skin disorders are common among adolescent college girls. The most prevalent group of skin disorders at this age is cosmetic one. Their proper management at earlier stages with education of patients is important to prevent late disfiguring complications and psychological sequelae.

Key words

Skin disorders, adolescence, acne, pigmentary disorders, melasma, folliculitis, eczema.

Introduction

Female students at intermediate, degree and masters level are in their teens. This period of life is associated with gross somatic and psychological changes in body. The gonadotrophic releasing hormone (GRH) from hypothalamus stimulates pituitary gland to secrete follicle-stimulating hormone (FSH) and leutinizing hormone (LH). Similarly, adrenocorticotrophic hormone (ACTH) from pituitary stimulates adrenal cortex to secrete

glucocorticoids, mineralocorticoids and androgens.^{1,2} The androgens with growth hormone induce rapid growth spurt, while it alone promotes growth of pubic and axillary hair, sebaceous glands and sebum production. These androgens also result in scalp seborrhoea and thinning of scalp hair.³

Ovarian development in females occurs under the action of FSH and LH. The ovary in turn secretes estrogens that results into increased pigmentation of skin.

The net sum of these hormonal changes around the time of puberty is growth and development of sebaceous glands, increased sebum production, development of apocrine glands, growth of pubic and axillary hair, appearance of

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hair in male pattern, seborrhea, dandruff and thinning of scalp hair.⁴

Therefore, disorders pertaining to these glandular structures occur with increased frequency and severity at this stage of life. These, combined with other dermatoses resulting from constitutional and exogenous factors such as eczema, folliculitis, bacterial and parasitic infections make these patients more vulnerable to psychological upset. Increased consciousness of youth of their body and beauty further aggravates their anxiety.

The aim of the present study was to investigate the pattern and severity of dermatoses in adolescent females by dermatologist's direct inspection in order to understand the effect and impact of skin diseases at this stage of life.

Patients and methods

This observational study was conducted at Hyderabad city from August, 2007 to October, 2007. The non-probability purposive sampling method was used to carry out this study. The target population was adolescent girls at their secondary and higher secondary education level. The reason for selection of students was easy access and convenience. Four intermediate and degree colleges of city were selected randomly on convenient basis. These colleges were visited and students there were asked to consult if they had any skin problem. An informed consent was obtained from all students after full explanation of the goals and procedure of study with strict ethical considerations. Students of all ages were included in study. A simple history was sought from them about their skin disorder regarding duration, onset, evolution and treatment they received for their problem. This was followed by detailed relevant examination.

Assessment The examination and assessment were conducted by qualified dermatologists in a separate room in the presence of chaperone. The lesions were examined meticulously for details and findings recorded on pre-designed proforma. The examination was confined to only those parts allowed by subjects. The groins, chest and genital areas were examined only if the patient consented. Different laboratory investigation were done if required.

Acne was classified on the basis of report of a consensus conference on acne classification in Washington.⁵ The presence of at least four to five comedones was required for the diagnosis of acne. Those having comedones as the only lesions were graded as patients with non-inflammatory acne. Less than four lesions were considered normal. Inflammatory acne was 'mild' if there were few to several papules/pustules but no nodules, 'moderate' for several to many papules/ pustules and few to several nodules, and 'severe' for numerous and/or extensive papules/pustules and many nodules. For the acne severity-related analysis, both non-inflammatory acne and mild inflammatory acne were accepted as 'mild acne'.

Ephelides were identified by their characteristic appearance on sun-exposed areas as groups of discrete, brown to yellowish, round or speckled macules with diameters of 2-3 mm.

Hair loss was measured by Ludwig scale.⁶

Increased pigmentation of skin over face was considered significant only when there was marked difference of colour between inner aspect of arm and the affected areas. For grading of melasma 'Melasma Area and Severity Index (MASI)' developed by Kimbrough-Green *et al.*⁷ was simplified. It was graded as mild if less than 30% of only one area of face was slightly darker

than surrounding area, moderate if 30-60% of 2-3 areas were darker than surrounding normal skin and severe if more than 60% of 3 or more areas were considerably darker than surrounding skin.

Scabies was recognized by the history and finding of characteristic pruritic lesions and burrows over wrists, interdigital areas, abdomen and groins. Family history of similar lesions was taken as supportive feature. Extraction of mite was not considered necessary for diagnosis.

The remaining disorders were easily recognizable and self-definable.

All the subjects were advised treatment for their skin disorders.

Results

A total of 1350 patients were examined. Their ages ranged from 16-24 years. The majority of subjects 890 (65.9%) had one disorder only; the remainder had two or more disorders at the same time. The most common second complaint was hair loss, followed by darkening of complexion.

Acne was the most common problem reported in our study (804, 59.5%). Face was the most frequent site affected (781, 97.1%) followed by trunk (23, 2.9%). Very severe acne (nodulocystic variety) was noted in 3 patients only. To assess the type and severity of acne at specific age we divided patients into two groups: group I constituted subjects from 16-20 years, group two from 21-24 years. It was found that grade II acne (comedones with few papules) was the most common type overall. Age group II had more severe acne with papulo-pustular and nodular lesions. Scars were also seen in age group II. Lesions of trunk were monomorphic comprising of erythematous papules.

Table 1 Skin Disorders in adolescent females with number of subjects affected (n=1350).

| S. No. | Skin disorder | n (%) |
|--------|------------------------|------------|
| 1. | Acne vulgaris | 804 (59.5) |
| | Mild | 217 (27) |
| | Moderate | 544 (67.7) |
| | Severe | 43 (5.4) |
| 2. | Hair Loss | 796 (59) |
| | Diffuse hair loss | 776 (97.5) |
| | Androgenetic | 20 (2.5) |
| 3. | Pigmentary disturbance | 490 (36.3) |
| | Diffuse darkening | 413 (84) |
| | Melasma | 77 (16) |
| 4. | Dandruff | 352 (26.7) |
| | Mild | 133 (37.8) |
| | Moderate | 165(46.9) |
| | Severe | 54 (16.05) |
| 5. | Hirsutism | 282 (20.9) |
| 6. | Ephelides | 87 (6.44) |
| 7. | Xerosis | 40 (2.9) |
| 8. | Idiopathic pruritus | 32 (2.3) |
| 9. | Eczema | 29 (2.1) |
| 10. | Pityriasis versicolor | 40 (2.9) |
| 11. | Folliculitis | 29 (2.1) |
| 12. | Tinea corporis | 26 (1.9) |
| 13. | Hyperhidrosis | 9 (0.7) |
| 14. | Scabies | 9 (0.7) |
| 15. | Vitiligo | 8 (0.6) |
| 16. | Alopecia areata | 7 (0.6) |

The next most common complaint was generalized hair loss reported by 796 (59%) students. On examination, mild sparseness of scalp hair (Ludwig grade I) was noted in most of the students. The hairs were fine and came out of scalp without pain. Only 20 (2.51%) subjects had significant sparseness of hair over frontoparietal region conforming to androgenetic alopecia. Four (18%) of these had mild to moderately elevated levels of androgens (confirmed at later visit). Associated dandruff was found in 1/3rd of patients with hair loss.

Among the 490 (36.29%) subjects complaining of increased facial pigmentation, 413/490 (84%) had diffuse darkening of face, neck, arms and feet. According to them pigmentation of skin occurred after joining studies.

Melasma patches (77/490, 15.7%) were found chiefly on malar areas of face and nose, and less frequently over forehead, neck and chest. These were light brown in colour measuring 3×4 cms to 4×5 cms in dimensions. Their average duration was 2 years. Melasma was mild in 26 (33%), moderate in 44 (57%) and severe in 7 (10%) patients

Dandruff (352, 26.1%) was graded as severe if patients had to shampoo their scalp daily to remove the scales, moderate if at an interval of 2-3 days and mild if they did so once a week. The majority 165 (46.9%) had moderate degree of dandruff. 133 (37.8%) participants had mild while 54 (16.1%) severe dandruff. It was sole complaint in 229/352 patients while it was associated with hair fall in 67, acne in 39, frank seborrheic dermatitis in 30 and pityriasis versicolor in 17 patients.

Excess growth of hair in male pattern (hirsutism) complained by 282 (20.9%) patients mostly affected upper lips and chin (159/282), followed by mandibles, upper chest and back. Hirsutism over trunk and groins could not be confirmed by examination due to consent problems. Five patients also demonstrated other features of hyperandrogenism like menstrual abnormalities and deepening of voice. Laboratory examination revealed raised serum testosterone levels in these patients.

Ephelides were seen chiefly on face and neck, less commonly on arms, abdomen, back and lower limbs. They were dark brown in colour, 1-3 mm in size and ranged from 5 to 15 in number.

Dryness of skin was associated with other manifestations of atopy i.e. itching, recurrent sneezing in 15/40 (37.5%) subjects.

The students presenting with generalized itching (32, 2.3%) had no cutaneous lesions or evidence of other dermatoses. History and the general condition of these patients did not suggest any systemic disorder.

Subacute eczema was seen in 29 (2.1%) patients. The sites involved were face, neck and hands in decreasing frequency. There was history of allergy to artificial jewelry and house hold items in these patients consistent with allergic contact dermatitis to metals.

Lesions of pityriasis versicolor were hypopigmented type in 32 patients and slightly erythematous or grey-coloured macules in 8 patients. The most common location was upper back, neck, upper chest and shoulders. Pruritus or slight burning was present in only 10 patients.

Folliculitis was noted over arms, legs, back and scalp. There were inflammatory erythematous papules with or without suppuration. The lesions were painful.

Tinea corporis were seen in 26 (1.9%) patients. The size of lesions ranged from as small as 3×3 cms to larger one of 7×10 cms. The sites involved were back in 10 patients, abdomen in 6 patients, arms in 5 patients, neck in 3 patients and face in 2 patients. The lesions were mildly scaly and associated with itching.

Scabies was present in 9 (6.7%) of patients. Infected lesions were seen in only one patient.

Vitiligo patches (8, 5.9%) were deeply white in 2 patients. Face, lips and hands were the most common locations for these lesions. Lesions of alopecia areata (7, 5.2%) were small (2×3 cms) to medium (5×7 cms) in dimension noted on scalp in 5 patients. In two patients concomitant involvement of eyebrows was found. One

patient had no hair on trunk, arms and legs in addition to two small patches on scalp.

Discussion

Many factors determine the pattern and prevalence of cutaneous diseases in a given population such as age, gender, race, occupation, environmental milieu, diet etc. Our study population comprised of adolescent females who are prone to develop certain dermatoses with increasing frequency than others because of changes in hormonal milieu. Among them acne, seborrhea, dandruff, increased pigmentation are well known. Moreover, these individuals are more conscious of their body, complexion and physical well-being and outlook. Therefore, minor cosmetic problems compel them for consultation.

Acne was the dominant cutaneous disorder seen in more than half (about 60%) of total patients in our study which is comparable to other studies.⁸ Others report its prevalence from 29% to 41%.^{9,10} Face was the most common site involved followed by trunk as shown in other studies.¹¹ Mild to moderately severe acne with a combination of comedones and inflammatory papules was the most common type of acne. Intake of eggs, milk and dairy products along with sweating and hot weather was incriminated in worsening the lesions by half of subjects as also shown by others.¹² The acne caused considerable anxiety and abstinence from studies in 10% of the subjects. These students had severe acne.

Hair loss was the next common complaint. Hair loss was global in nature. The true magnitude of problem is difficult to establish from this study as the data on the hair density and thickness in our population are lacking. The complaint was exaggerated by this highly conscious segment of

population. In the absence of any apparent systemic or local cause for generalized hair loss, it can be assumed constitutional factors or micro-deficiency of iron, vitamins and proteins may be the cause of hair loss in these subjects.^{13,14} Additional cause may be the associated dandruff as demonstrated by Nematian *et al.*¹⁵

Increased pigmentation was reported by 1/3rd of subjects in our study. This affected face, neck and outer parts of arms. This was understandable. The skin type in our population ranges from Fitzpatrick type III to V. This skin type is prone to tan on sun exposure. Being less aware of tanning effect of sun light; they indulge in outdoor activities and frequently resort to sun exposure during cold weather or unintentionally roam under open sky. These factors may promote tanning and darkening in these subjects.¹⁶ There was no obvious evidence suggesting some sinister cause for pigmentation like Addison's disease, arsenicalism, hyperthyroidism etc. The history also did not suggest progressive hyperpigmentation syndrome of autosomal dominant type.¹⁷

However, patches of pigmentation confirming to melasma were seen in 99 subjects. These were light brown in colour. The less darkening of melasma patches at this age compared to older females may be because the former are still not exposed to progesterone hormone of pregnancy.¹⁸

Dandruff was complained by about 1/4th of subjects. Its prevalence is high in general population.¹⁹ This was moderate in severity. Seasonal variation with increased severity in autumn and winter was reported by the subjects. The association of dandruff with hair fall, acne, seborrheic dermatitis and pityriasis versicolor is

understandable as *Propionibacterium acnes* plays etiological role in all these disorders.²⁰⁻²³

Hirsutism was seen in substantial number of patients (282/1350). Its reported prevalence in different studies varies from 5% to 40%.^{24,25} Involvement of mandibles, chest, and limbs was seen with lesser frequency. Most of the patients had growth of fine, less pigmented hair. Only 5 patients had other features of androgenism in form of menstrual irregularities and deepening of voice. Hirsutism in these patients was moderately severe.²⁶

The prevalence of atopic dermatitis varies in different races and regions and ranges from less than 1% to more than 20%.²⁷ In our study, about 40 (3%) subjects complained of dryness of skin. Among these only 12 had other features of atopy like pruritus, dust allergy, positive family history and frequent bouts of sneezing and rhinorrhea consistent with atopic dermatitis. The remainder had none of these features apart from xerosis. The prevalence of xerosis is estimated to be 2.2%.²⁸ Use of hard soaps coupled with lesser tendency to moisturize their body after bath or underlying atopy may be the alternate cause of xerosis in these subjects.

In students complaining of pruritus, neither there was any evidence of pruritic dermatoses nor any evidence of any systemic disorder; therefore, it was labeled as idiopathic. It was noted in 2.3% of subjects and is comparable to one of 2.2% in other studies.²⁸

The prevalence of vitiligo was 0.19% in a Chinese study.²⁹ Vitiligo patches were seen in 8 (0.6%) subjects affecting mostly face.

Hyperhidrosis causes embarrassment and is often precipitated by anxiety and mental stress. 0.7% of our subjects manifested these features.

Its complications include pompholyx and contact dermatitis.³⁰ Our patients had no such complications though it was embarrassing and mentally disturbing.

Other cutaneous disorders like pyoderma, folliculitis, scabies, pediculosis etc. were seen with less frequency in our study. The reason for less frequency of bacterial and parasitic infection may be meticulous attention to body hygiene. Similarly, eczema was less frequent because these patients are less exposed to household allergens as their older counter parts.

It was evident from our study that cosmetic problems form the bulk of cutaneous disorders in adolescents. Females in our society are more conscious of their cosmetic problems because of cultural and social customs. If these are left untreated or treated improperly, may result in grave cosmetic and psychological consequences at later life. Therefore, it is prudent to recognize and treat these within time. We recommend the introduction of a preventive health education programs on skin diseases for adolescent population at different levels and their families and teachers. A periodic visit of dermatologist to institutions would help to boost awareness among this subset of population.

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