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Spectrum of Skin Diseases among Teenagers in Eastern India- An Observational Study

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Abstract
Introduction- *Skin diseases are a major health problem affecting a high proportion of the population in India.Skin diseases can place a heavy emotional and psychological burden on patients that may be far worse than the physical impact.*
Material and Methods*-This study was conducted in Dr D.Y. Patil Medical college, from July 2012 to September 2014, included 200 adolescents, 13 to 19 years of age, whose history, precipitating factors and morphology was taken into consideration.*
Result*- Amongst the various physiological changes, acne was seen in 53(26.5%) patients. Hair loss was the next most common problem, which is very much global in nature. Amongst all the pathological disorders found, infections were seen in (40;20%) of our study patients*
Conclusion*- From the findings of one- year- period prevalence of various skin disorders we conclude that skin morbidities are very common among college students, particularly cosmetic problems like acne, hair loss and skin tan. . Establishment of registries for specific skin diseases, particularly for those with a high disease burden will also help in good case accountability stressing importance to dermatological public health.*
Key words*—Skin Diseases, Teenagers, Eastern India*

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I. Introduction

Skin diseases are a major health problem affecting a high proportion of the population in India.[1] Skin diseases can place a heavy emotional and psychological burden on patients that may be far worse than the physical impact.[2] Increased consciousness especially among the youth of their body and beauty further aggravates their anxiety.[3]

Many factors determine the pattern and prevalence of cutaneous diseases among the youth such as gender, race, personal hygiene, quality of skin care, environmental milieu and diet.[4] In some instances, patients appear to produce their skin lesions as an outlet for nervous tensions arising from interpersonal conflicts and/or unresolved emotional problems.[5]

Even though dermatology is characterized by an enormous range of disease/reaction patterns, prevalence surveys suggest that the bulk of skin diseases belong to fewer than ten categories.[6]Such observations are useful in developing educational and preventive health programs for the benefit of university students. Their proper management at earlier stages with education of students is important to prevent disfiguring complications and psychological sequelae later in life.[3] 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 hair in male pattern, seborrhea, dandruff and thinning of scalp hair[2]. 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.

However, very few studies have been carried out in India to find out the problem of skin diseases and that especially among the medical students. The reason for this negligence could be the low mortality rate of the majority of skin diseases in comparison with other diseases. This has also resulted in international health policy makers and local decision makers to make dermatological morbidities a low priority.[7] Another concern is that the benefits of public health interventions in reducing the prevalence, morbidity and mortality of skin diseases may be underestimated.[8] Thus there is a need for more studies with respect to dermatological morbidities in a developing country like India. With this background, this study was carried out to find out the pattern and

severity of skin disorders and to describe their association with various socio-demographic factors among Adolescent students.

II. Materials And Method

This cross-sectional study was done in 2017-2018. The ethical approval for conducting this study was obtained from institutional ethics clearance committee. A sample size of 228 was determined using a confidence level of 95%, with 15% degree of precision of the expected proportion and an estimated minimum prevalence of 40%. These students were chosen from the college going lot through convenient sampling method so that the sample will have a balanced representation of std 12^{th}, graduation and post-graduation students of various institutions.

The students were briefed about the objective of the study and written informed consent was taken for participation. A pre-tested self-administered semi-structured questionnaire was used for data collection. The face validity of this questionnaire was done by an expert in dermatology who reviewed the contents of the questionnaire. The questionnaire was subjected to a pilot trial on 10 students before it was distributed in its final form. Reliability of the questionnaire was assessed using Cronbach's Alpha the value of which was 0.82 indicating good internal consistency. Questions on the presence of any skin morbidities suffered by the student participants in the past 1 year were asked.

Additionally questions like frequency of face wash in a day, usage of facial cleansing products, frequency of head and body bath in a week, frequency of usage of hair shampoo in a week, usage of sunscreen lotions, moisturizers or cosmetics, frequency of changing Additionally questions like frequency of face wash in a day, usage of facial cleansing products, frequency of head and body bath in a week, frequency of usage of hair shampoo in a week, usage of sunscreen lotions, moisturizers or cosmetics, frequency of changing into new clothes, habit of sharing linen with friends and promptness in seeking dermatologist consultation for skin ailments were asked to assess the quality of skin care.

Life style habits were assessed based on amount of water consumed in a day, frequency of eating fatty or oily food stuffs in a week, frequency of consumption of fruits and vegetables in a week, smoking habits and recreation habits like swimming.

Each response for the question meant to assess quality of skin care and life style habits were given scores from 0 to 2. Scores from 0 to 11 for questions deciding quality of skin care meant poor, 12-22 meant good level of skin care. Similarly scores from 0 to 5 for questions deciding life style meant poor and 6-10 meant good level of lifestyle habits.

The data entry and analysis were done using Statistical Package for Social Sciences software package (SPSS Inc., Chicago, IL) version 16. Chi-square test was used to find out the association of socio-demographic variables with the presence of skin morbidities, quality of skin care and life style habits $P < 0.05$ was taken as statistically significant association.

The study pattern was divided into three groups physiological, pathological and miscellaneous. In physiological changes 54(27%); acne 53(26.5%) and hormonal changes 1(0.5%) were observed; pathological changes included 115(57.5%) cases which comprised of infections 40(20%)infestations 9(4.5%), dermatitis 22(11%), papulosquamous disorders 9(4.5%), pigmentary disorders 15(7.5%), hair disorders 11(5.5%), photosensitive disorders 4(2%), urticaria 5(2.5%) and miscellaneous disorders 31 (15.5%).

As shown in **Table 1**, acne outnumbered (26.50%) all other disorders followed by various miscellaneous disorders (15.5%), fungal infections (12.5%), dermatitis (11%) and rest other disorders with an incidence of 7.5% and below.

Table 1: Distribution Of All Dermatoses Seen In The Study:

	Diagnosis	**No of cases**	**Percentage**
Physiological changes	Acne	53	26.5
	Hormonal changes	1	0.5
Pathological changes	Infections:		
	Fungal	25	12.5
	Bacterial	7	3.5
	Viral	8	4
	Infestations	9	4.5
	Dermatitis	22	11
	Papulosquamous diseases	9	4.5
	Pigmentary disorders	15	7.5
	Hair disorders	11	5.5
	Photosensitive disorders	4	2
	Urticaria	5	2.5
	Miscellaneous	31	15.5
	Total	200	100

Table 2 shows comparison of infections, infestations, dermatitis and miscellaneous with males and females in the study group. Total females patients 104(52%) outnumbered males 96(48%). Acne cases 52(26.5%) were reported, out of which 25were males and 28 were females; in contrast to miscellaneous disorders 31(15.5%) where males were 18 and 13 females.

TABLE 2: Sex Wise Distribution Of Various Dermatoses In Study Group:

Diagnosis		**Male**	**Female**	**Total**
Acne	Acne	22 (22.92)	25 (24.04)	47
	Acne + canities	1 (1.04)	0	1
	Acne + pityriasis sicca	0	1 (0.96)	1
	Acne + post inflammatory hyperpigmentation	1 (1.04)	1 (0.96)	2
	Acne + scars	0	1 (0.96)	1
	Steroid induced acne	1 (1.04)	0	1
Hormonal changes	Hyperhidrosis	0	1 (0.96)	1
Fungal infections	Pityriasis versicolor	4 (4.17)	5 (4.81)	9
	Tinea corporis	1 (1.04)	4 (3.85)	5
	Tinea cruris	2 (2.08)	2 (1.92)	4
	Tinea cruris+corporis	4 (4.17)	0	4
	Pityrosporum folliculitis	1 (1.04)	1 (0.96)	2
	Tinea unguium	1 (1.04)	0	1
Diagnosis		**Male**	**Female**	**Total**
Viral infections	Common wart	1 (1.04)	0	1
	Varicella zoster	0	1 (0.96)	1
	Molluscum contagiosum	3 (3.12)	2 (1.92)	5
	Viral exanthema	1 (1.04)	0	1
Bacterial infections	Folliculitis	0	4 (3.85)	4
	Furuncle	2 (2.08)	0	2
	Hansen's disease	0	1(0.96)	1
Infestations	Scabies	7 (7.29)	2 (1.92)	9
Dermatitis	Allergic contact dermatitis	0	2 (1.92)	2
	Seborrheic dermatitis	2(2.08)	5(4.81)	7
	Atopic dermatitis	0	1 (0.96)	1
	Contact dermatitis	0	1 (0.96)	1
	Eczema	2 (2.08)	4 (3.85)	6
	Irritant contact dermatitis	0	1 (0.96)	1
	Cheilitis	1 (1.04)	0	1
	Plantar keratoderma	0	1 (0.96)	1
	Palmo-plantar keratoderma	1(1.04)	0	1
	Pompholyx	1(1.04)	0	1
Diagnosis		**Male**	**Female**	**Total**
Papulosquamous disorders	Pityriasis rosea	1(1.04)	4(3.85)	5
	Psoriasis	0	3(2.9)	3
	Lichen planus	0	1(0.96)	1
Pigmentary disorders	Vitiligo	9(9.3)	4(3.85)	13
	Melasma	1(1.04)	1(0.96)	2
	Hair disorders	2(2.08)	9(8.65)	11
	Photosensitive disorders	0	4(3.84)	4
	Urticaria	2(2.08)	3(2.88)	5
	Miscellaneous disorders	18(18.75)	13(12.5)	31
Total		96(100)	104(100)	200

III. Discussion

Our study, "Evaluation of skin disorders in teenagers" , conducted in Dr D.Y. Patil Medical college, from July 2012 to September 2014, included 200 adolescents, 13 to 19 years of age, whose history, precipitating factors and morphology was taken into consideration.

Physiological changes:

Amongst the various physiological changes, acne was seen in 53(26.5%) patients. This was not in accordance to the findings of Sharma et al (20.6%) and Joseph et al (10.8%) , which showed a lower incidence. Acne was predominantly seen in females (28; 52.8%) with majority having grade 2 acne (36;67.92%) followed by grade 3 (9;16.98%), grade 1(6;11.32%) and grade 4 (2;3.77%) respectively. Oily food and sweat were observed to be the aggravating factors.

The reported incidence of grade 1 acne in Indian studies was 60.2%[70] and 67.7%[4].

Acne was noticed in both early and late adolescence. However, 40(75.4%) cases in late adolescence outnumbered 13(16.04%) cases of early adolescence with an overall females predilection(1:0.89). Kilkenny et al observed higher incidence of acne in between the ages, 16-18 years[11].

Acne cases had accompanying disorders like post inflammatory hyperpigmentation in 2(3.77%) cases and canities, acne scars, pityriasis sicca and steroid induced acne in 1 case each (1.88%) . This could be attributed to continuous picking and use of various cosmetic products or non-prescription medications. Acne has been incriminated with sweating and hot weather, which is very compatible with the hot and humid climatic conditions prevailing in Mangalore.[14] The proportion of severe acne cases in this study was 10.8% which was more than the observation of 5.4% made in the Sindh based study.[3] Studies carried out in other countries have found that acne is a disfiguring disease and it should not be looked at as trivial,[15] as it may seriously affect the patient's life.[16]Screening adolescents for conditions like acne may be of great importance because it affects their image in the society and because of the wide armamentarium of therapy which is available.[17]

Hair loss was the next most common problem, which is very much 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 subjects was lacking. There was significant association of dandruff as a risk factor for hair loss in this study which was similar to the findings of other studies.[3,18]However, in the absence of any apparent systemic or local cause for generalized hair loss, it can be assumed that constitutional factors or micro-deficiency of iron, vitamins and proteins may be the cause of hair loss in these subjects.[19,20]

Hair loss culminating in baldness is another sensitive issue among adolescents as they are invariably sensitive regarding their external features and thus may be easily withdrawn psychologically and avoid social activities due to androgenetic alopecia and this tends to affect girls more than boys.In this study almost a quarter of students had baldness with greater proportion observed among males.

Increased tanning of skin was the third most common morbidity. This was understandable as 68% of the participants had fair or whitish skin. This skin type is prone to tanning on sun exposure. Being less aware of the tanning effect of sun light and not using personal protective measures while outdoors must have promoted tanning and darkening in these subjects.

Fungal infections were reported by more than a third of our participants in the past 1 year. Previous studies have reported that periods of high humidity (50-80%) and elevated temperatures reaching up to 35°C are ideal for fungal infections.[17] This probably could explain the reason behind a number of cases with fungal infections among students in Mangalore.

Hyperhidrosis causes embarrassment and is often precipitated by anxiety and mental stress. 0.5% (1 case) of patient manifested this feature and our finding was in accordance to a study by Bajaj et al, which reported an incidence of 0.7%[4].

Pathological changes:

Amongst all the pathological disorders found, infections were seen in (40;20%) of our study patients which highly correlated to studies conducted by Bajaj et al 9% [4] and Sharma et al 17.6% [19].

In our study fungal infections (25;12.5%) outnumbered viral infections (8;4%) and bacterial infections(7;3.5%). This was similar to a study conducted by Sharma et al [19] which showed fungal infections in 9.5%, viral infections in 4.5% and bacterial infections in 4.1% cases.

Amongst cases with fungal infections, M:F ratio was 1.08:1 with pityriasis versicolor (9;36%) being the commonest type, followed by tinea corporis5(20%), tinea cruris 4(16%) cases and both(tinea cruris and corporis- 4;16%) cases.

This was not in accordance to a study conducted by Sharma et al, M:F:: 2.80:1[19], pityriasis versicolor in 3.6% and tinea in 5.6% [19] whereas Bajaj et al observed pityriasis versicolor in 2.9% and tinea corporis in 1.9%[4].

Lack of health awareness, poor personal hygiene, poverty and overcrowding could be the possible factors that contributed to the higher prevalence of fungal infections. Previous studies reported periods of high humidity (50- 80%) and elevated temperatures reaching up to 35°C being an ideal for fungal infections [13].

In our study viral infections had an incidence of 4% (8 cases), which were exclusively seen during late adolescence. These included 62.5%(5) cases of Molluscum contagiosum, in contrast to an incidence of 2.5%and 1.6%[19] , seen in other Indian studies.A single (12.5%) case of verruca vulgaris, viral exanthema and varicella zoster each was noticed in our study whereas Sharma et al reported a higher incidence of 1.9% of varicella zoster and 1.1%[19]verruca vulgaris.

An overall male dominance (1.6:1) in viral infections was observed, which was similar to a study conducted by Laxmisha et al (1.6:1).

Among bacterial infections, seen in (7,3.5%), folliculitis (4 cases; 57%) was the commonest and seen exclusively in females. A study done by Sharma et al concluded 4.1% of bacterial infections and 1.7% of folliculitis[19] whereas Bajaj et al reported a total incidence of 2.1% of bacterial infections[4].

Amongst infestations, only 9(4.5%) cases of scabies were found. This correlated with the observations of Bajaj et al (0.7%)[4] and Sharma et al (11.9%).[19]

Overall incidence of dermatitis was 11% (22cases), which was comparatively lower to western studies i.e.18% to 34%.

11(50%) cases of various types dermatitis (50%) were observed in our study which comprised of 6(27.2%) cases of eczema, 2(9.09%) cases of allergic contact and 1(4.5%) each of atopic, irritant contact and contact dermatitis. 7(31.8%) cases of seborrheic dermatitis were observed which was not in accordance to studies conducted by Sharma et al (4.9%[19]) and Henshaw et al (0.8%).

Female predilection (1:0.4) was noted in dermatitis with a history of allergy to artificial jewellery and house hold detergents in these patients. A Polish study demonstrated 19.4% of females and 0.5% of males.

In our study we observed 15(7.5%) cases of pigmentary disorders, comprising of vitiligo (13;86.6%) and melasma (2;13.3%) whereas an Indian study showed an overall incidence of 6.1%[19] for pigmentary disorders.

Vitiligo has shown variable incidences in different studies like Marinho et al 34%, Bajaj et al 0.6%[4] and our study (86.6%). Amongst all types, vitiligo vulgaris had the highest incidence of (7;53.8%), followed by focal vitiligo (4;30.7%), stable (1;7.69%) and segmental vitiligo (1;7.69%) in our study.

In our study, we noted male predilection for vitiligo with (M:F:: 2.25:1), which was high in comparison to a study done by Marinhe et al 1.7:1.

9(4.5%) cases of papulosquamous disorders were observed in our study with a marked females predilection (8:1). Amongst the cases, pityriasis rosea (5;55.5%) outnumbered psoriasis (3;33.3%) and lichen planus (1; 11.1%).

Pityriasis rosea showed a female preponderance (M:F :: 1: 4) in our study, similar to Chuh et al (1:1.43)and Ayanlowo et al (1:1.5) and in contrast to Sharma et al (2:1).

Psoriasis had an incidence of 33.3% (3cases) in our study whereas an Indian study (1.4%)and Greek study (1.2%) revealed differently.

Hair disorders were reported in 11 (5.5%) cases comprising of 8 (72.7%) cases of telogen effluvium, 1 (9.09%) case of alopecia areata and 2 (18.1%) cases of canities ; with an overall female predilection (M:F::1:4.5).Bajaj et al reported an incidence of 0.6% of alopecia areata[4] whereas Sharma et al reported an incidence of 2.1%[19] for hair disorders and canities.

PMLE was the only photosensitive disorder observed in the study group, exclusively seen in females, with 2%(4cases) incidence. Previous Indian studies reported 2.87%and 1.4% [19] ; with a male preponderance (5:1)[19] .

Urticaria was seen in 5 (2.5%) cases (M:F:: 0.6:1) and was not in accordance to Sharma et al (5.4%[19]; M:F:: 1.5:1).

In this study acne was found to be slightly more and hair problems was seen significantly more among females, which was similar to the findings of a study done among university students in Lebanon where both acne and hair problems were significantly more among females.[17]

Although there was no significant difference between the proportion of males and females with acne in the present study, the type of acne differed significantly between the two groups. White/black heads were seen significantly more among females while papule and pustule were seen significantly more males. This was similar to the observation made in another study carried out in New Zealand where severe type of acne was seen more among males. Severity of this condition among males could be because of hormonal factors.

Fungal infection seen significantly more among males in this study could be due to their lesser quality of skin care and life style habits in comparison to females. Other cutaneous disorders like pyoderma, folliculitis, scabies and pediculosis were not seen in this study. The reason for absence of these bacterial and parasitic infections could probably be that very few participants in this study had poor quality of skin care or hygiene. No cases of eczema, hyper pigmentary lesions like melasma, hypopigmentary lesions like vitiligo, nail disorders or skin cancers were reported by any of the participants.

IV. Conclusion

From the findings of one- year- period prevalence of various skin disorders we conclude that skin morbidities are very common among college students, particularly cosmetic problems like acne, hair loss and skin tan. Severe types of acne and fungal infections were significantly more among males whereas hair morbidities were significantly more among females

This emphasizes the need to popularize the importance of personal protective measures like usage of sun screens among students. Establishment of registries for specific skin diseases, particularly for those with a high disease burden will also help in good case accountability stressing importance to dermatological public health.

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