ADOLESCENTS' SKIN CARE VISITS: A TEN YEAR REVIEW

Abstract

Background

Skin conditions are noted to be common in adolescence and are known to affect the quality of life resulting in some cases severe emotional outcomes such as depression. Knowledge of this spectrum of dermatoses in a tertiary health institution will assist in quantifying skin diseases associated with greatest burden.

Aim: To investigate the spectrum and characteristics of adolescent dermatoses

Methods: This a retrospective descriptive cross-sectional study done at the dermatology outpatient clinic (DOPC), of the University of Port Harcourt Teaching Hospital, Alakahia, Rivers state. The data was collected from the register of new patients seen between the periods of January 2006 to December 2015. Patients aged 10-19 years presenting with a fresh complaint of a skin disorder was included in the study.

Results: The total number of adolescents and diagnoses that presented the DOPC within the period was 685 and 785 constituting 12.2 % of all new patients (5619) and dermatoses13.2% of all new dermatoses(5961) seen within that period. The M: F ratio was 1:2 with the 17-19 years age group having the highest presentation of 43.6%. The major diagnoses made up to 50.3% of all the new diagnoses.

Conclusion: There is a variety of dermatoses that can occur in adolescence. The top 12 major ones are acne vulgaris, atopic dermatitis, papular urticarial, vitiligo, pityriasis versicolor, pityriasis rosea, contact dermatitis, tinea corporis, seborrhoeic dermatitis, warts, fixed drug eruption and lichen planus

Key words: Adolescents, Care, Dermatoses, Skin, Visits

Introduction

The adolescence period is characterized by an accelerated growth in self-management skills, independence and self-confidence.[1] The adolescence period is the critical transition from being a child to a fully grown adult. The time period is difficult to define.[2] The World Health

Organization defines this period chronologically from 10-19 years.[3] Skin conditions are noted to be common and are known to affect the quality of life resulting in some cases severe emotional outcomes such as depression, poor body image, social engagement and even suicide.[4] Skin changes usually seen in at this time include increased oil production (sebum), acne, and hair growth, particularly involving the pubic region and axilla. The male adolescent will develop thicker, "terminal" hair on their face, limbs and bodies. Approximately 90% of adolescents will be affected by acne at some stage.[5] The few studies that have been done in the Nigerian paediatric group have often categorized the paediatric group as a single entity without taking into consideration the distinct bio-physiological differences of this age group. Other studies which have focused on the secondary schools which may have the limitation of capturing the early phase of adolescence (10-13) years. Focusing on secondary schools students may rightly help in diagnosing a lot of skin conditions which may be both benign and malignant and may help in making appropriate referral to the dermatology clinic however this also fails to determine the actual skin dermatoses in this particular group that make them and /or their caregivers anxious enough to visit the dermatology clinics hence the essence of this study.

Methods and materials

This a retrospective descriptive cross-sectional study done at the dermatology outpatient clinic (DOPC), of the University of Port Harcourt Teaching Hospital, Alakahia, Rivers state. The clinic is a weekly one and is run by consultant dermatologists. The data was collected from the register of new patients seen between the periods of January 2006 to December 2015. Every adolescent aged 10-19 years presenting with a fresh complaint of a skin disorder at the dermatology outpatient clinic of the University of Port Harcourt Teaching Hospital, Alakahia, Nigeria between January 2006 and December 2015 was included. Patients with incomplete data were excluded. Anonymous data such as the age of adolescent, gender of the adolescent, date of initial visit and the diagnosis were retrieved and entered into software and analyzed using Microsoft Office Word Excel 2007. Being a retrospective observational study based on administrative data, formal consent was not sought; the researchers however did obtain the approval of the officer in charge of the records to obtain the needed data

Results

The total number of adolescents that presented the DOPC within the period was 685 constituting 12.2 % of all new patients (5619) seen within that period as illustrated in Table 1 and Figure 1. A total of 765 diagnoses were seen with, 605(88.3%) patients having a single diagnosis, 78(11.4%)persons having two skin diagnosis, 1(0.15%) person each having up to three and four skin diagnoses respectively. The percentage of adolescent dermatoses comparative to the total number of dermatoses seen in the DOPC was 13.2% of all new diagnoses. The table clearly shows that the female adolescents clearly supersede the males with regards to skin clinic visits over the years except for 2009 when the numbers are almost the same.

Table 1: The ratio of Male to female adolescents over the 10 year period

YEAR	MALES	FEMALES	RATIO
2006	25	30	0.8:1
2007	19	53	0.4:1
2008	26	58	0.4:1
2009	33	32	1:1
2010	29	52	0.6:1
2011	32	66	0.5:1
2012	15	47	0.3:1
2013	13	27	0.5:1
2014	19	22	0.9:1
2015	28	59	0.5:1
TOTAL	**239**	**446**	**0.5:1**

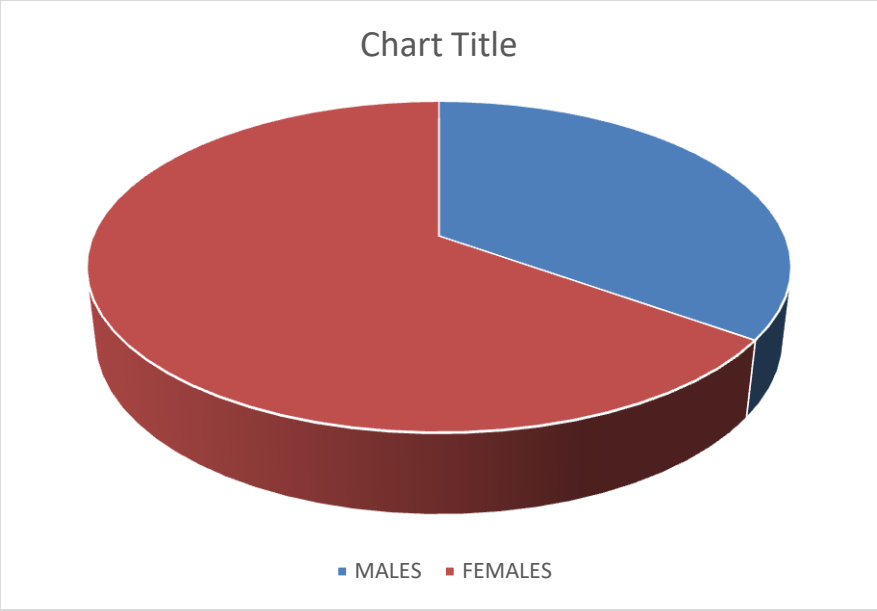

Figure 1: The sex distribution of adolescents at DOPC, UPTH

Table 2: Number of cases per year

YEAR	Total Cases
2006	55
2007	72
2008	84
2009	65
2010	81
2011	98
2012	62
2013	40
2014	41
2015	87
TOTAL	685

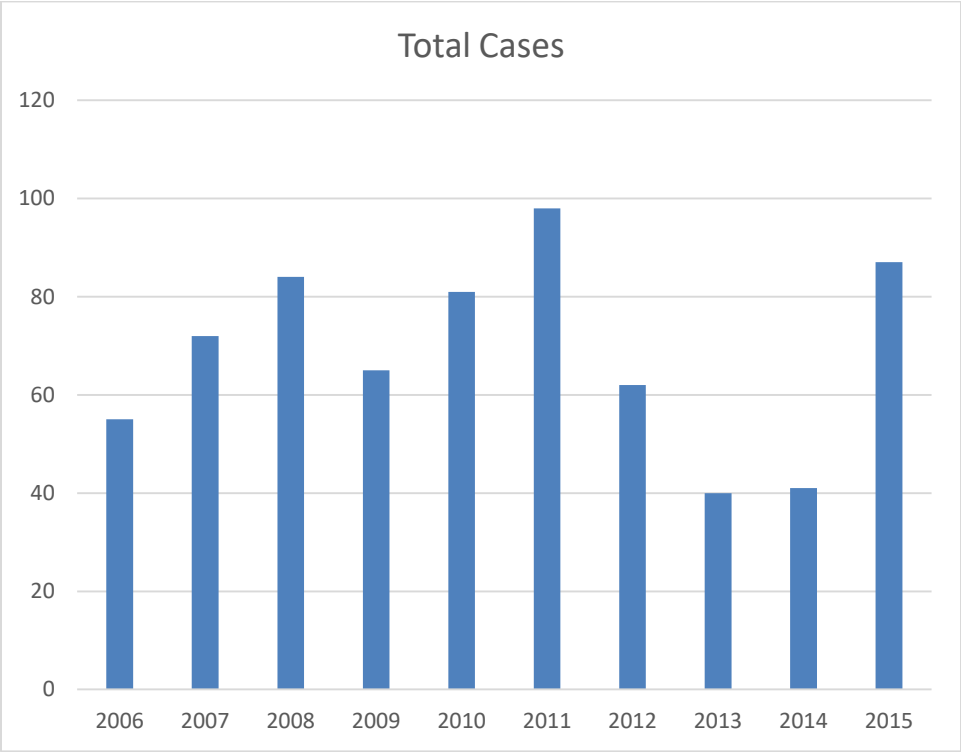

Figure 2: Number of cases per year

Table 3: Number of cases by age range

Age Range	No. of Cases	Percentage
10-13yrs	217	31.7%
14-16yrs	169	24.7%
17-19yrs	299	43.6%
Total	685	

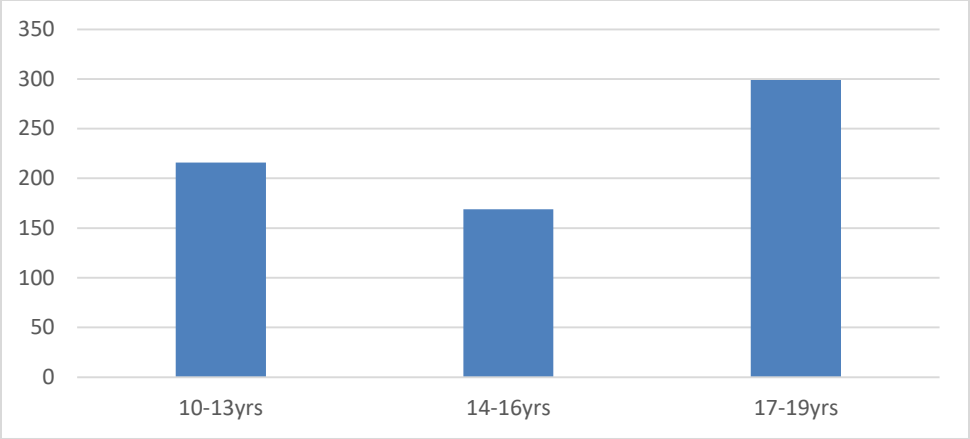

Figure 3: Number of cases by age range

Table 4: Top 12 Adolescent dermatoses

Skin Disorder	Number of diagnoses	% of total diagnoses
ACNE VULGARIS	50	6.5
ATOPIC DERMATITIS	50	6.5
PAPULAR URTICARIA	49	6.4
VITILIGO	38	5.0
PITYRIASIS VERSICOLOR	36	4.7
PITYRIASIS ROSEA	30	3.9
CONTACT DERMATITIS	30	3.9
TINEA CORPORIS	26	3.4
SEBORRHOEIC DERMATITIS	25	3.3
WARTS	18	2.4
FIXED DRUG ERUPTION	17	2.2
LICHEN PLANUS	16	2.1
TOTAL	385	50.3

Table 5- The Classification of different diagnoses and gender distribution

Class	**Number (Percentage %)**		**Class**	**Number (Percentage %)**	
1- Appendages' disorders 82 (10.7)	**M 37(4.8)**	**F 45(5.9)**	**2- Dermatitis 139 (18.2)**	**M 43(5.6)**	**F 59(12.6)**
Acne keloidalis nuchae	3(0.4)	0(0)	Atopic dermatitis	13(1.7)	37(4.8)
Acne vulgaris	25(3.3)	25(3.3)	Contact dermatitis (allergic)	4(0.5)	13(1.7)
Alopecia areata	2(0.3)	1(0.1)	Contact Dermatitis(irritant)	5(0.7)	8(1.0)
Diffuse alopecia	0(0)	1(0.1)	Discoid Eczema	1(0.1)	1(0.1)
Folliculitis	3(0.4)	7(0.9)	Erythroderma(Generalized Exfoliative dermatitis)	0(0)	3(0.4)
Fox Fordyce disease	0(0)	1(0.1)	Finger Dermatitis	0(0)	2(0.3)
Frontal alopecia	0(0)	1(0.1)	Foot Dermatitis	0(0)	1(0.1)
Keratosis pilaris (follicular keratosis)	0(0)	3(0.4)	Hand Dermatitis	1(0.1)	3(0.4)
Phrynoderma	3(0.4)	3(0.4)	Hand and foot dermatitis	1(0.1)	3(0.4)
Steatocytoma multiplex	1(0.1)	0(0)	Lichen Simplex Chronicus	2(0.3)	3(0.4)
Sychosis cruris	0(0)	1(0.1)	Non-specific Dermatitis	0(0)	2(0.3)
			Onchodermatitis	1(0.1)	1(0.1)
3- Infections/Infestations 205 (26.8)	**73(9.5)**	**132(17.3)**	Pompholyx	1(0.1)	4(0.5)
Bacteria 20 (2.6)	***6(0.8)***	***14(1.8)***	Pruritic eczematous lesions	2(0.3)	0(0)
Carbuncle	0(0)	1(0.1)	Seborrhoeic dermatitis	12(1.6)	16(2.1)
Folliculitis	4(0.5)	7(0.9)			
Furuncle	1(0.1)	2(0.3)	**4-Hypersensitivity reactions/Blistering lesions 107(14.0)**	**30(3.9)**	**77(10.1)**
Impetigo	0(0)	3(0.4)	Angioedema	0(0)	1(0.1)
LGV	1(0.1)	0(0)	Annular Erythema	1(0.1)	0(0)
Reactive arthritis	0(0)	1(0)	Blistering eruption	0(0)	1(0.1)
Fungal 125(16.3)	***42(5.4)***	***84(10.9)***	Bullous disease of childhood	0(0)	1(0.1)
Candidiasis(vaginal discharge)	0(0)	2(0.3)	Bullous drug reaction	0(0)	1(0.1)
Dermophytic folliculitis	2(0.3)	1(0.1)	Demographism	0(0)	3(0.4)
Fungal infections(non specified)	1(0.1)	2(0.3)	Epidermolysis bullous simplex	1(0.1)	0(0)
Intertrigo	0(0)	1(0.1)	Fixed Drug Eruptions	8(1.0)	19(2.5)
Kerion	3(0.4)	1(0.1)	Granuloma annulare	1(0.1)	1(0.1)

Paronychia	1(0.2)	3(0.4)	Hypersensitivity drug reaction	0(0)	1(0.1)
Pityriasis versicolor	11(1.4)	25(3.3)	Lupus profundus	1(0.1)	0(0)
Tinea captis	4(0.5)	4(0.5)	Nodular prurigo	0(0)	1(0.1)
Tinea corporis	9(1.2)	18(2.4)	Papular urticarial	12(1.6)	37(4.8)
Tinea cruris	5(0.7)	3(0.4)	Pruritus(generalized + localized	6(0.8)	6(0.8)
Tinea glutei	0(0)	1(0.1)	Systemic lupus erythromatosus(SLE)	0(0)	5(0.7)
Tinea incognito	1(0.1)	2(0.3)			
Tinea mannum	1(0.1)	7(0.9)	**6-Hypertrophy/Atrophy/ Excessive thickening 25 (3.3)**	**M 8(1.0)**	**F 17(2.2)**
Tinea pedis	3(0.4)	11(1.4)	Callus/corns	1(0.1)	2(0.3)
Tinea ungium	1(0)	5(0.7)	Hypertrophic scar	1(0.1)	2(0.3)
Infestations 16(2.0)	***9(1.2)***	***6(0.8)***	Keloids	2(0.3)	7(0.9)
Cutaneous larva migricans	0(0)	1(0.1)	Palmoplanter Keratoderma	3(0.4)	3(0.4)
Ectoparasite infestation (None specified)	1(0.1)	0(0)	Striae	1(0.1)	3(0.4)
Filariasis	0(0)	1(0.1)			
Scabies	8(1.0)	5(0.7)	**8-Papulosquamous lesions 79 (10.3)**	**30(3.9)**	**49(6.4)**
Mycobacterium 12(1.6)	***6(0.8)***	***6(0.8)***	Lichen nitidus	3(0.4)	4(0.5)
Leprosy	6(0.8)	4(0.5)	Lichen planus	6(0.8)	16(2.1)
Scrofuloroderma	0(0)	2(0.3)	Lichen striatus	1(0.1)	1(0.1)
Viral 32 (4.2)	***10(1.3)***	***22(2.9)***	Pityriasis alba	0(0)	1(0.1)
Herpes simplex	0(0)	2(0.3)	Pityriasis amiantacea	0(0)	1(0.1)
Herpes zoaster	0(0)	1(0.1)	Pityriasis lichenoides Chronica /PLEVA	1(0.1)	4(0.5)
Molluscum contagiosum	1(0.1)	5(0.7)	Pityriasis rosea	13(1.7)	17(2.2)
Papular Pruritic Eruptions(PPE)	2(0.3)	3(0.4)	Psoriasis	6(0.8)	5(0.7)
Warts	7(0.9)	11(1.4)			
			10-Tumours 29 (3.8)	**11(1.4)**	**18(2.4)**
5-Pigmentary disorders 53 (6.9)	***20(2.6)***	***33(4.3)***	Congenital giant naevi	0(0)	1(0.1)
Acanthosis nigricans	0(0)	1(0.1)	Epidermal naevi	0(0)	1(0.1)
Albinism	0(0)	1(0.1)	Epidermodysplasia verruformis	3(0.5)	1(0.1)
Exogenous onchronosis	0(0)	1(0.1)	Fibrosarcoma(breast)	0(0)	1(0.1)
Hyperpigmented lesions	1(0.1)	0(0)	Haemangioma	0(0)	1(0.0)
Hypopigmented lesions	1(0.1)	2(0.3)	Melanocytic Naevi	0(0)	1(0.1)

Idiopathic gutatte hypomelanosis	0(0)	1(0.1)	Naevus sebeaceous	0(0)	1(0.1)
Piebaldism	1(0.1)	0(0)	Neurofibromatosis	3(0.4)	4(0.5)
Post inflammatory hyperpigmentation(PIH)	3(0.4)	3(0.4)	Sarcoid	1(0.1)	0(0)
Vitiligo	14(1.8)	24(3.1)	Syringoma	4(0.5)	6(0.8)
			Trichoepithelioma	0(0)	1(0.1)
7-Ulcers/Wounds 6(0.8)	**3(0.4)**	**3(0.4)**			
Excoriations	0(0)	2(0.3)	**11-Others 17 (2.2)**	**4(0.5)**	**(1.7)**
Linear ulcer	2(0.3)	0(0)	Childhood dermatoses	0(0)	1(0.1)
Pyoderma gangerosum	0(0)	1(0.1)	Ichthyosis	0(0)	5(0.7)
Right auricular erosion	1(0.1)	0(0)	Lentigenes	1(0.1)	0(0)
			Lichen amyloidosis	1(0.1)	0(0)
9-NO Diagnosis 3 (0.4)	**1(0.1)**	**2(0.3)**	Malar rash	1(0.1)	0(0)
			Mycosis fungoides	0(0)	1(0.1)
			Pustulosis	0(0)	1(0.1)
			Xerosis	1(0.1)	5(0.7)

Percentages are approximated to the nearest single digit

The commonest skin lesions seen within the different age groups in order of decreasing frequency were : the early adolescence category (10-13) were papular urticaria, atopic dermatitis, contact dermatitis, tinea corporis, seborrhoeic dermatitis and pityriasis rosea; the mid adolescence group (14-16) were acne, pityriasis versicolor, pityriasis rosea, atopic dermatitis, papular urticaria and vitiligo; and amongst the late adolescence were acne, atopic dermatitis, pityriasis versicolor, vitiligo, seborrhoeic dermatitis and papular urticaria.

Erythroderma complicated atopic dermatitis and was the sole diagnosis in two patients. There was impetiginization of two cases of papular urticaria, a case of tinea corporis, a case of allergic contact dermatitis, pruritus of the breast and a case of linear skin ulcer. Id's reaction was a complication on background tinea corporis. Out of the 685 adolescents, 3(0.4%) patients were diagnosed with Human Immunodeficiency Virus (HIV) with majority 2(0.3%) having pruritic papular eruption and 1(0.1%) was diagnosed with papular urticaria. The major categories of diseases seen can be appreciated in **table 5**.

Discussion

The prevalence of adolescence dermatoses in this study was slightly lower when compared to the study done by Medsani et al in Pudcherry, India and Vanlalhriatpuii et al in Manipur, India .The prevalence of adolescence dermatoses consisted of 13.1% and 20.18% of the total population of

patients with skin complains.[6, 7] In a study done in South Africa showed the value to be 7.8% amongst those 12-18 years at a dermatology clinic.[8] The difference may be attributable to difference in the general population of the adolescents in the community and in increased awareness amongst adolescents or their caregivers in these areas to seek for skin care treatment with a professional. Higher prevalence rates were seen in studies done amongst secondary school students carried out within the same region and in other places. Oyedepo et al reported a value of 66.5%, Henshaw et al reported a point prevalence of 64.2 % and in another school in Nepal had a point prevalence of 25.5% .[9, 10, 11] The difference in the study can be attributed to the different population characteristics while initial population looks at a mixed population , the other concentrates on the adolescent population. The M: F ratio clearly shows a predominance of the females attending the skin clinic amongst the adolescents. This finding is similar to studies done by Oyedepo et al, Altraide et al, Amadi et al, Awopeju et al, Ayanlowo et al, Azugbogu & Ojule and Onila et al showed that females were more affected with skin diseases evidenced by higher female ratios.[9, 12-17] This can be explained by the studies being within the same region and the hormonal influences affecting the integumentary system during pubertal stage are likely going to create more concern for the female thus causing them to visit the dermatology or paediatric clinics. Studies done by Henshaw et al sowed a 72.2% point prevalence of skin disorders in males, Ogunbiyi et al had 51.2 % and Otike-Odibi & Azubogu had 54.5% of males were affected respectively. The marked variation of number of adolescents seen within the various years can be attributed to varying factors such as industrial strikes and public holidays which fall on dermatology clinic days that may have affected the dermatology outpatient visits. Similar trends was seen in a study of the under-fives done in that same area within the same period.[13, 20] The group with the highest numbers that visited the clinic was those aged 17-19 years as seen in **figure 3** and **table 3**. This is way higher than studies done amongst adolescents who were seen in the secondary schools carried out by Oyedepo et al and Henshaw et al that had 21.3 % and 21.1 % respectively.[9, 10] This may be likely due to the fact that the adolescents in this age group may have finished secondary school and are already in the university or working, they are also likely to be more independent minded and have some sort of financial power to visit the skin clinics and can make and take decisions about their own health without waiting for their caregivers or parents. The top diagnoses as seen in the **table 4** such as acne vulgaris and pityriasis versicolor were similar to the studies done by Oyedepo et al, Henshaw et al, Shrestha et

al Onila et al and Ogunbiyi et al. [9, 10, 11, 17, 18] A total of 120 diagnoses including 'no diagnosis' were made which were grouped into 10 major categories as seen in **table 5** above. The dermatoses as seen in **table 5**; show that the most common categories were dermatitis (eczema), infections and papulosquamous lesions. This findings is in contrast to study done by Uldag et al where benign neoplasms, pigmentary disorders and xerosis were the commonest findings.[21] Ogunbiyi et al and Oyedepo et al had disorders of appendages as highest. Dermatitis(eczema) were also noted to be high in studies done by Katibi et al and Shrestha et al.[8, 11] Henshaw et al, Ayanlowo et al, Azubogu & Ojule and Onila et al had infections as the most predominant class seen in this study. [10, 15-17] Some skin lesions were more predominant in a particular gender. Acne keloidalis nuchae which is known as folliculitis nuchae was exclusively seen in males. This finding is similar to several studies; however there have been case reports of AKN occurring in females. This has been linked to shaving of the hair which is commonly practiced by men within the environment.[22, 23] SLE was exclusively seen in females and this may be related to hormonal factors such as increase in oestrogen and prolactin, decrease in androgen and differences gonadotropin-releasing hormone (GnRH) signalling.[24] Pityriasis versicolor, atopic dermatitis, contact dermatitis, fixed drug eruptions and lichen planus were seen more in females. This may be due to the higher prevalence of females in this study. Exogenous onchronosis which results from the harmful use of skin lightening was also reported in this study but was of lower incidence when compared to the study done by Ogunbiyi et al that showed 2.5% (36) and Oyedepo et al had 2.2%(19) who were mainly females.[18] Gender differences have been noted in skin disorders with males having more of infectious diseases while females tend have more autoimmune conditions, allergic diseases, certain hair disorders, pigmentary disorders and psychomotor problems. The reasons underlying sex-based disparity in the development of skin and skin-related diseases remains largely unknown but are likely multifactorial due to differences in skin structure and physiology, effect of sex hormones, ethnic background, sociocultural behaviour and environmental factors.[25, 26]

The commonest categories seen within the different age categories of the adolescent group were similar to the study done by Oyedepo et al within Nigeria where acne was the predominant dermatoses in the mid and late adolescence but the prevalent dermatoses within the early adolescence in their study was pityriasis versicolor as against papular urticarial in this study. This can be explained by the different population characteristics, while this study is a hospital

based study, theirs is a secondary school population. Ayanlowo et al study which was also hospital based had similar finding of acne in those aged 13-18 years but did not separately look at those 10-13 as an adolescent age group.[9, 15] Impetignization, that is superimposed bacterial infection of either streptococcus or staphylococcus giving it a golden crust appearance of skin diseases is common of other dermatological conditions as seen in this study and the major risk has been attributed to poorly treated skin lesions. [27] Erythroderma is a skin disorder characterized by redness of the skin which can be a complication from other skin diseases, drugs or malignancy.[28] Erythroderma was also reported in studies done by Katibi et al that showed a prevalence of 0.2%, while that by Ayanlowo showed a prevalence of 1.1%(77) amongst children of varying ages including adolescents. [8, 15] Id reaction, or autoeczematization, is a generalized acute cutaneous reaction to a variety of stimuli, including infectious and inflammatory skin conditions. The exact incidence and aetiology is not known. [29] This study shows a small percentage of patients with HIV, although this could actually be higher if all were screened. The study done by Katibi et al showed a higher prevalence of 6.7 %(28) of all cases although theirs was a mixed population of children including adolescents. [8] The prevalence of HIV in adolescents in Sub Saharan Africa is highest in South Africa and in Nigeria.[30]

Conclusion

There is a variety of dermatoses that can occur in adolescence. The top 12 major ones are acne vulgaris, atopic dermatitis, papular urticarial, vitiligo, pityriasis versicolor, pityriasis rosea, contact dermatitis, tinea corporis, seborrhoeic dermatitis, warts, fixed drug eruption and lichen planus

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