

Prevalence and Pattern of Skin Infections and Infestations among Primary School Pupils in Ijesha Land

OA Oyedeji *, O Onayemi +, GA Oyedeji **, O Oyelami **,
TA Aladekomo **, JA Owa **

Abstract

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Background: The prevalence and pattern of skin infections and infestations have not been adequately studied in developing countries.

Objective: To determine the prevalence and pattern of skin infections and infestations (SII) among primary school pupils living in Ijesha-land, Western Nigeria.

Design: A multi-staged randomised cross sectional descriptive study.

Methodology: Interview schedules, physical and laboratory examinations were conducted among 1,120 pupils (546 boys and 574 girls) recruited by stratified random sampling.

Results: A total of 544 SII were found among 453 (40.4 percent) pupils, whilst 667 (59.6 percent) pupils had none. Impetigo contagiosa, dermatophytosis, pityriasis versicolor and scabies were the leading SII found, with prevalences of 19.4, 15.0, 6.1, and 4.3 percent, respectively. Except for pityriasis versicolor, SII were more common in boys than girls. Furthermore, pityriasis versicolor was more commonly seen among older pupils aged nine years and over ($p < 0.001$), dermatophytosis was more common among the younger pupils while all the other skin diseases showed no significant differences by age grouping. The head was the most common site affected by SII, while most impetiginous lesions were on the lower limbs. Tinea capitis and pityriasis versicolor were predominantly located on the scalp and face, respectively.

Conclusion: Skin infections and infestations in school children deserve a serious public health concern and action. Appropriate intervention programmes should be pursued to reduce their burden.

Running title: Skin infections and infestations, school children.

Introduction

SKIN infections and infestations (SII) are common among primary school pupils in third world countries, with prevalence figures ranging between 30 to 84 percent.^{1,2} Many of the SII though preventable, are easily transmissible and may result in significant complications such as glomerulonephritis, septicaemia, disfigurement and death.³ Among the various predisposing factors to SII identified by previous researchers are ignorance, poverty, overcrowding, poor nutrition and the high humidity of tropical communities.^{1,3} In Nigeria, there are few documented studies on the prevalence and pattern of SII among children. These previous studies have limitations because they were hospital or health centre based.³⁻⁴ According to the World Health Organization, results obtained from studies of school children have been

Ladoke Akintola University Teaching Hospital,
Osogbo

Department of Paediatrics
* Lecturer/ Consultant Paediatrician

Obafemi Awolowo University, Ile-Ife

Department of Dermatology and Venereology
+ Professor/Consultant Dermatologist
Department of Paediatrics
** Lecturer/Consultant Paediatrician
** Professor/Consultant Paediatrician

Correspondence: Dr OA Oyedeji
E-mail: soltomoyedeji@yahoo.com.

found to be representative of findings in the 6 to 16 year childhood populace living in the larger community.⁵ The Ijesa people among whom the present study was conducted live in 6 semi-urban local government areas in Western Nigeria.

Subjects and Methods

By the process of stratified random sampling, 1,200 pupils were selected from a sampling frame consisting of 166 schools with a student population of 58,424, between February and July 2003. Out of the total 52 urban and 114 rural located schools, 10 urban and 20 rural schools were randomly selected. Of these urban and rural schools, 60 and 30 pupils respectively, were selected randomly from each school. Each school has 5 classes (classes 1-5), and the class registers were used to randomly select the pupils in numbers which took cognisance of equal proportions for the classes, ages and sexes of the pupils. Data was obtained by means of a structured questionnaire. This included age sex, domiciles, presence of SII, occupation and education of parents

Physical examination was carried out in a well-lit room and aided by the use of magnifying glasses, with the subjects undressed. The presence of SII was noted and recorded. Mycological, bacteriological and mite identification were also carried out in order to confirm the diagnoses and identify the underlying agents. Swabs of forty impetiginous lesions and furuncles were taken aseptically and subjected to bacteriological microscopy culture and sensitivity. Also skin scrapings were taken from the lesions in all the pupils with dermatophytosis and the scrapings were visualized under the microscope after application of 5 percent potassium hydroxide. Also, scrapings were cultured in Sabouraud's medium containing

chloramphenicol, and cycloheximide to inhibit bacterial growth. The skin burrows and fresh papules were scraped with a new size 15 blade in 24 pupils and then observed microscopically for the mite, ova and scybala of the sarcopte scabiei mite after application of a drop of mineral oil on the selected lesion. Appropriate treatment and instruction for disease care were given immediately after diagnosis to the individuals affected.

The results were analysed with the Pearson chi-squared (χ^2) tests using the SPSS for Windows software version 11.0 (SPSS Inc., Chicago, IL). Yates correction was applied when necessary and *P* values < 0.05 were considered statistically significant.

Results

Of the 1,200 pupils selected, 1,120 completed the study. These 1,120 pupils consisted of 546 boys and 574 girls giving an overall male: female ratio of 1: 1.1. There were 558 (49.8 percent) pupils consisting of 266 boys and 292 girls in the lower age group 6-9 years, compared with 562 (50.2 percent) pupils (280 boys and 282 girls) in the older age group >9-12 years.

Prevalence and types of skin infections and infestations (SII)

A total of 544 SII were found among 453 (40.4 percent) of the 1,120 pupils, as 90 (8.0 percent) had more than one infection or infestation, while 667 (59.6 percent) pupils had none. Impetigo contagiosa, dermatophytosis, pityriasis versicolor and scabies were the leading SII found with prevalences of 19.4 percent, 15.0 percent, 6.1 percent and 4.3 percent, respectively (Table I). Altogether, these skin diseases constituted 89.5 percent of the SII observed. Viral

Table I

Pattern of Skin Infections and Infestations (SII) among 453 Pupils

<i>SII Cases</i>	<i>Number of Pupils</i>	<i>Percentage of 544</i>	<i>Case Prevalence (%)</i>
Impetigo contagiosa	217	39.9	19.4
Dermatophytosis	168	30.8	15.0
Pityriasis versicolor	68	12.5	6.1
Scabies	48	8.8	4.3
Viral warts	21	3.9	1.8
Furunculosis	9	1.7	0.8
Creeping eruptions	8	1.5	0.7
Molluscum contagiosum	5	0.9	0.4
Total	544*	100.0	49.9

*Some pupils had more than one SII

infections such as warts, molluscum contagiosum, and the bacterial infection furunculosis constituted the remainder of the SII. Scabies was the most common infestation recorded, while impetigo contagiosa and dermatophytosis were the most common bacterial and fungal skin infections, respectively.

Age group prevalence of SII

Two hundred and eighty eight (51.6 percent) of the 544 SII cases occurred among the 558 pupils aged 6-9 years as against 272 (48.4 percent) cases seen among the 562 older children. However, this higher percentage of SII among younger pupils was not

significant ($\chi^2 = 1.16, p = 0.282$). Table II shows the distribution of pupils with SII, by age group. Pityriasis versicolor was more commonly seen among the older pupils aged >9-12 years ($p = 0.000814$), dermatophytosis was more common among the younger pupils ($p = 0.000364$), while all the other skin diseases showed no significant differences by age grouping.

Sex distribution of pupils with SII

In general, there was a male sex predilection for the SII, as 268 (49.1 percent) of 546 boys had SII compared with 185 (32.2 percent) of 574 girls. This

Table II
Comparative Analysis of the Pupils with SII by Age Groups

SII Cases	No (%) of Pupils with SII in Age Groups		χ^2	P
	6-9 Years (N=558)	>9-12 Years (N=562)		
Impetigo contagiosa	105 (18.8)	112 (19.9)	0.22	0.638
Dermatophytosis	105 (18.8)	63 (11.2)	12.71	0.000364
Pityriasis versicolor	20 (3.6)	48 (8.5)	11.21*	0.000814
Scabies	28 (5.0)	20 (3.6)	1.12*	0.290
Viral warts	10 (1.8)	11 (2.0)	0.00*	1.000
Furunculosis	5 (0.9)	4 (0.7)	0.00*	0.991
Creeping eruptions	5 (0.9)	3 (0.5)	0.13*	0.715
Molluscum contagiosum	3 (0.5)	2 (0.4)	0.00*	0.994
Total	281 (50.3)	263 (46.8)	1.16	0.282

*Chi-squared with Yates correction applied

Table III
Comparative Analysis of the Pupils with SII by Sex

SII Cases	No (%) of Pupils with SII in each Gender Group		χ^2	p
	Males (N = 546)	Females (N = 574)		
Impetigo contagiosa	146 (26.7)	71 (12.4)	36.99	< 0.05
Dermatophytosis	115 (21.1)	53 (9.2)	30.71	< 0.05
Pityriasis versicolor	26 (4.8)	42 (7.3)	3.20	0.07
Scabies	29 (5.3)	19 (3.3)	2.27 *	0.13
Viral warts	11 (2.0)	10 (1.7)	0.01 *	0.91
Furunculosis	7 (1.3)	2 (0.3)	2.00 *	0.16
Creeping eruptions	4 (0.7)	4 (0.7)	0.00 *	1.00
Molluscum contagiosum	3 (0.5)	2 (0.3)	0.00 *	0.96
Total	268 (49.1)	185 (32.2)	33.00	< 0.05

*Chi-squared with Yates correction applied

greater male predominance with SII was highly significant ($\chi^2 = 33.00, p < 0.0001$). Table III details the distribution of pupils with SII by sex. The male predominance was seen with individual SII except pityriasis versicolor but was statistically significant only with regard to dermatophytosis and impetigo contagiosa cases. The female predominance in pityriasis versicolor was without statistical significance ($\chi^2 = 3.20, p = 0.073$).

Body sites affected

The site most commonly affected by SII was the head, while the abdomen and chest were the least affected. However, majority of the impetiginous lesions occurred on the lower limbs, while scabies had a predilection for the upper limbs, especially, the hands. Tinea capitis was the most common infection affecting the scalp. Table IV shows the details of sites affected by SII.

opted to assist in farming and other duties. In addition, boys tend to be more adventurous than girls, thus explaining the slight male sex predilection observed in this study.

Tinea capitis has been the scourge of young children until the onset of puberty since the middle ages.⁸ The pre- and school age years prior to puberty constitute the period when children mix and crowd together, thus creating the avenue for easy transmission of infections and infestations from one to the other. Other reasons adduced for the susceptibility of the primary school age include their poor lipophilic scalp excretion and acquired immunity.⁹ These reasons might also explain the higher prevalence of dermatophyte infections among the younger age group in the present study. The humid weather conditions experienced in the tropics has also been noted to support the growth of dermatophytes.^{3,9}

Table IV

Anatomical Distribution of SII Cases

SII Cases	No (%) of Pupils						Total
	Head	Face	Chest	Abdomen	Upper limbs	Lower Limbs	
Impetigo	35(16.1)	6(2.8)	19(8.8)	154(71.0)	2(0.9)	1(0.4)	217
Dermatophytosis	136(80.9)	2(14.3)	5(3.0)	0	1(0.6)	2(1.2)	168
Pityriasis versicolor	0	5(75.0)	3 (4.4)	1(1.5)	3(19.1)	0	68
Scabies	1(2.1)	3(6.3)	40(83.3)	0	0	4(8.3)	48
Viral warts	4(19.0)	7(33.3)	1 (4.8)	6(28.6)	2(9.5)	1(4.8)	21
Furunculosis	2(22.2)	1(11.1)	1(11.1)	5(55.6)	0	0	9
Creeping eruptions	0	3(37.5)	1(12.5)	1(12.5)	0	3(37.5)	8
Molluscum contagiosu	0	3(18.8)	8(50.0)	5(31.2)	0	0	16

Discussion

The present study has established that SII are common among Ijesha primary school pupils. The prevalence was similar to those reported in previous studies conducted in Africa.¹⁻³ This is to be expected because of the similar climatic, hygienic and socio-economic factors obtaining in the places of the studies. Impetigo contagiosa and dermatophytosis constituted more than two thirds of the diseases recorded in the present study. This pattern is similar to those previously reported by Oyedeji *et al*⁶ from the same area. However, Oyedeji *et al*'s⁶ study which involved younger children aged six years and below, was not specifically on SII, but was a general clinical and anthropometric study. The major predisposing factor to most bacterial skin infections is trauma. Injuries breach the normal protective surface of the skin.⁷ Children are prone to injuries and African school children are no exceptions, as some of them are co-

On the other hand, there was a preponderance of pityriasis versicolor infection among the female sex and older age school children. This finding may be explained by the fact that the causative fungus, "*Malassezia furfur*" needs cholesterol to thrive. Peaks in body cholesterol level are more likely in the female sex especially at puberty. Due to the predilection of this disease for the face, its psychosocial effect is sometimes more important than the infection. Since the disease presents at puberty, which is the critical period of self-awareness, it may affect young people socially and academically because of resultant poor concentration on their studies and low self-esteem. Our prevalence values for warts and molluscum contagiosum are low and similar to those obtained by others.^{3,4} These are self-limiting infections usually found on body parts, which make little or no contact with other young people.

Scabies was the most common infestation recorded in this study. There was a preponderance of these infestations among the lower age groups. Similar findings have been observed by other workers who explained the lower age predilection to infestation on the basis of low immunity among younger unexposed pupils.^{10,11} The disease can easily be transmitted in schools where children come from various backgrounds.

A closer attention should be paid to the school health programme including health education, hygienic behaviour and good nutrition promotion. There is also a need to raise the socio-economic level of the populace. Provision of water, soap and suitable modification of the uniform to cover the exposed parts of the legs and upper limbs can reduce the portion of the body surface exposed and reduce the incidence of trauma, which predisposes to infections. Presently, most of the schools have uniforms exposing a considerable proportion of the upper and lower limbs. Our recommendation on the school uniform, can however only have limited effect on the face, which cannot be covered.

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