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A Community Based Cross Sectional Study on Skin Disorders in Children Attending Integrated Child Development Scheme (ICDS) Centres in Tirunelveli (Urban), Tamil Nadu, India

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ABSTRACT

Background & objectives: Survey of pre-school and school children is a useful yardstick for identification of infective dermatoses as early as possible and to prevent the upcoming epidemics among the community. Except for few hospital-based studies, there are no studies among pre-school children in community level including ICDS centres. Hence, we took an initiative for this study which has its implications on various health care policies and services catered to the children.

Methodology: A cross-sectional study was conducted among children of 3 to 5 years of age attending ICDS centres in urban Tirunelveli over a period of 2 months (2018). A sample size of 405 was chosen from 23 centres by stratified random sampling. The screening and clinical diagnosis of dermatoses was made. Descriptive statistical analysis was followed.

Results: A total of 405 children (204 boys & 201 girls) were screened and the prevalence of skin disorders was 8.14% (n=33). Infectious, non-infectious and nutritional deficiency disorders accounted for 2.46%, 4.7% and 0.98% respectively. Among infections and non-infectious dermatoses, pityriasis versicolor and papular urticaria was the commonest respectively.

Interpretation& conclusions: Infectious dermatoses were in low numbers compared to non-infectious dermatoses reflecting the non-contagious environment. Absence of nutritional dermatoses and good hygiene reflect the well programmed health services and nutritional support provided to children in this part of Tamil Nadu.

Key words: Dermatoses, ICDS, preschool children, Tirunelveli, Tamil Nadu

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INTRODUCTION

Skin is the largest protective organ covering entire body separating the internal milieu from external milieu. Skin disorders are one of the most important causes for the morbidity and sometimes mortality in developing countries.[1] Skin diseases in the pediatric population are common all over the world including rural and urban areas which are high in the former than the latter which may be due to poor socio-economic status, poor personal hygiene, overcrowding, lack of health education and awareness and improper sanitation.[2] Pre-school children generally are more prone for pyodermas, scabies, eczema, miliaria, nutritional deficiency disorders, genetic disorders and few others.[3] The disease pattern varies due to the above mentioned reasons and also due to different ecological factors.[4] School and pre-school survey is a useful yardstick for identifying and treating the infective dermatoses as early as possible and also to prevent the transmission of disease among the school children and the community.[5] Skin disorders in children may result in considerable morbidity, psychological impact, school absenteeism, poor academic performances, parental anxiety and embarrassment to the child. This leads to loss of confidence, disruption of social relations and major changes in their lifestyle.[6] Even genetic disorders can be screened for and diagnosed early for timely counselling and management to prevent complications and learning issues.

Prevalence of paediatric dermatoses has been reported to be 14.3% to 69.38% from various hospital or school based surveys across India.[2,4,7,8] Most of the currently available studies are mainly hospital based involving 1 to 14 years of age and few are school based involving 5 to 14 years but none on preschool children in India to the best of our knowledge.[2,4,7-12] There is one global study involving the preschool children in Baghdad (Iraq).[13] Except for few studies which have been done for assessment of nutrition and facilities provided, there are no studies on pattern and prevalence of dermatoses that have been done exclusively at the community level among pre-school children attending ICDS centres in urban and rural India including Tamil Nadu.[14,15] The results from tertiary care and referral centres do not directly represent the scenario prevailing in the general population. Thus, community-based screening is needed in order to understand the actual epidemiology of the dermatoses, and also their estimation and characterization have important implications in planning various health care policies and services to the society.

MATERIALS AND METHODS

This was a community based cross sectional study conducted among children of 3 to 5 years of age attending ICDS centres in urban Tirunelveli over a period of 2 months in 2018. This study was approved by the Ethical Committee of our institution and permission was obtained from Child Welfare Officer and social welfare department and school teachers in charge of ICDS centres which were located in three corporation zones of the city. The total number of ICDS centres in Urban Tirunelveli were 162 with a total of 2900 subjects. A sample size of 405 was calculated using the sample size calculation formula. Based on this, all 162 ICDS centres in urban Tirunelveli were arranged based on zonal distribution and every n^{th} centre (n=7) was selected and thus 23 centres spread over the mentioned three zones were selected to get a sample size of 405 by stratified random sampling methodology.

The purpose of the study was explained to the head of the institution of ICDS centre and informed consent was obtained from them for clinical examination and taking relevant photographs wherever necessary. The data regarding name, age, sex, area or locality, nutritional noon meal food, environmental sanitation and personal hygiene were analysed. Their anthropometric measurements like height for age, weight for age and mid-arm circumference were all noted from their individual records. All these children were screened for the presence of dermatoses under natural sunlight and they were diagnosed primarily by dermatological examination. The dermatoses were broadly classified as infectious, non-infectious and nutritional deficiency disorders. This was classified based on the primary and secondary skin lesions examined clinically in each individual. Presence of scaly hyperpigmented or hypopigmented macules and patches suggests superficial fungal infections like pityriasis versicolor and dermatophytosis. Presence of purulent discharge or crusted lesions implies bacterial infections like impetigo, furuncle, folliculitis, pyodermas, etc. Presence of itchy excoriated papules over the flexural areas and scalp itching with lice suggests parasitic infestations like scabies, pediculosis corporis, pediculosis capitis, etc. Non-infectious dermatoses like atopic dermatitis, ichthyosis, vitiligo, papular urticaria, etc. are diagnosed with their specific dermatological presentation. And nutritional deficiency disorders like pellagra, petechiae, vitamin B12 deficiency induced hyperpigmentation, phrynoderma etc are diagnosed with their skin, hair and nail changes. The data were entered in a predesigned proforma and extrapolated in Microsoft excel sheet and analysed. Descriptive statistical analysis was followed for describing the prevalence and pattern of dermatoses which are explained in percentages and ratios and chi square test with $p<0.05$ was used for test of significance for comparisons.

Approval of instituitional ethical review board was sought before the start of the study (Ref no: 1275/MBBS/2018).

RESULTS

A total of 405 children including 204 boys (50.4%) and 201 (49.6%) girls in the age range of 3 to 5 years were screened in the selected ICDS centres. The mean anthropometric findings noted in the children in ICDS centres are depicted in table 1.

Table 1: Anthropometric findings of children

Parameters	Mean ± SD
Height (centimetres)	91.51±7.11
Weight (kilograms)	13.76±2.21
Mid-arm circumference (centimetres)	14.53±1.15

Table 2: Category-wise distribution of dermatoses

Dermatoses	Male (%) (n=204)	Female (%) (n=201)	Total (%) (n=405)
Infectious	4 (0.98)	6(1.48)	10(2.46)
Non-infectious	9(2.2)	10(2.5)	19(4.7)
Nutritional deficiency disorders	3(0.74)	1(0.24)	4(0.98)
Total	**16(3.92%)**	**17(4.22%)**	**33(8.14%)**

The overall prevalence of skin disorders was 8.14% (n=33; M=16, F=17) with equal sex ratio. For discussion purpose, they were classified under three broad categories as infectious, non-infectious and nutritional deficiency disorders and each of them accounted for 2.46%, 4.7% and 0.98% respectively **(table 2).** Non-infectious dermatoses (n=19) were the most commonly encountered with mosquito bite allergy or papular urticaria (1.5%) to be the most predominant condition followed by pityriasis alba (1.2%) **(fig 1)**. Other non-infectious dermatoses include milder form of autosomal dominant ichthyosis (0.5%) **(fig 2)**, vitiligo (0.24%) **(fig 3)**, miliaria rubra (0.24%), traumatic nail dystrophy (0.24%) and atopic eczema (0.24%). Among infectious dermatoses (n=10), pityriasis versicolor (0.74%) **(fig 4)** was the most common condition followed by pediculosis capitis (0.5%) and pyoderma (0.5%). The other infectious dermatoses include impetigo **(fig 5)**, scabies and tinea corporis each accounting for 0.24% respectively. Nutritional deficiency disorders included xerosis with phrynoderma **(fig 6)** which accounted for 0.98% (n=4) of pre-school children. **(table 3)**

The anthropometric measurements were all recorded and were found to be within normal limits. Environmental sanitation and personal hygiene were all maintained fairly well in all ICDS centres.

Table 3: Gender-wise distribution of specific dermatoses

Dermatoses	Male (%) n=204	Female (%) n=201	Total (%) n=405
Infections& infestations			
Pityriasis versicolor	2	1	3 (0.74)
Pediculosis capitis	-	2	2 (0.5)
Pyoderma	1	1	2 (0.5)
Tinea corporis	-	1	1 (0.24)
Scabies	1	-	1 (0.24)
Impetigo	-	1	1 (0.24)
TOTAL	4(0.98)	6(1.48)	10 (2.46)
Non-infectious conditions			
Mosquito bite allergy or papular urticaria	3	3	6 (1.5)
Pityriasis alba	3	2	5 (1.2)
Mild autosomal dominant ichthyosis	-	2	2 (0.5)
Seborrheic dermatitis	2	-	2 (0.5)
Miliaria rubra	1	-	1 (0.24)
Early vitiligo	-	1	1 (0.24)
Atopic eczema	-	1	1 (0.24)
Traumatic nail dystrophy	-	1	1 (0.24)
TOTAL	9(2.2)	10(2.5)	19 (4.7)
Nutritional deficiency			
Xerosis with phrynoderma	3(0.74)	1(0.24)	4 (0.98)
Total	16(3.92)	17(4.22)	33 (8.14)

DISCUSSION

India adopted the National Policy for children in 1974 and constituted a National Children Board to ensure continued planning, monitoring and coordination of welfare services for children.[16] In pursuance of this policy, the country launched the largest universal programme called Integrated Child Development Scheme (ICDS) on 2nd October 1975. ICDS scheme is a pioneer scheme that caters for over several million beneficiaries, which include pre-school children of 3-6 years of age and pregnant and lactating women from poor socio-economic groups.[17] They are funded by the central and state government in the ratio of 60:40. The main goal of ICDS is to provide Early Childhood Education (ECE) for children mainly to enable good physical, mental, emotional, social, language and cognitive development.[18] ICDS is today the largest community-based outreach programme for holistic early child development. It is a crucial link between the disadvantaged communities in the aspect of primary health care and education systems.

Figure 1: Pityriasis alba- multiple vaguely - Defined hypopigmented macules and patches over bilateral cheeks

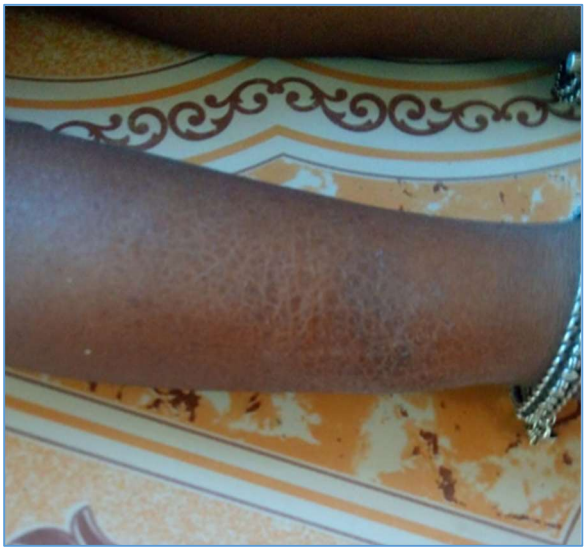

Figure 2: Autosomal dominant Ichthyosis - Defined fish like polygonal scales over bilateral extensor aspect of lower legs

Figure 3: Early vitiligo- Multiple hypopigmented patches over left thigh

Figure 4: Pityriasis versicolor-multiple hypopigmented macules and patches with pencil line border over neck

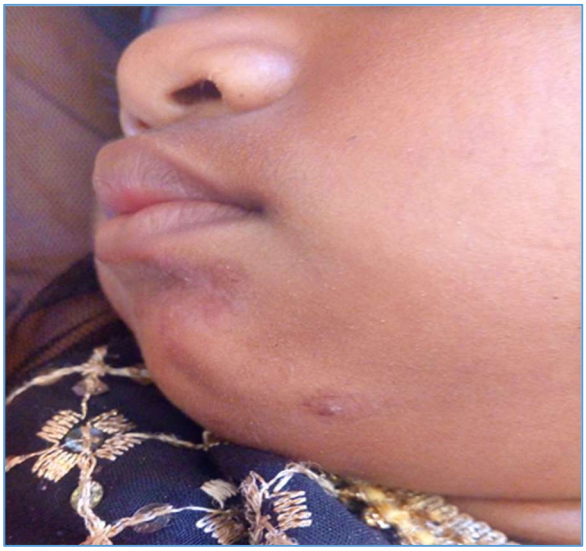

Figure 5: Impetigo – few crusted papules and plaques over chin

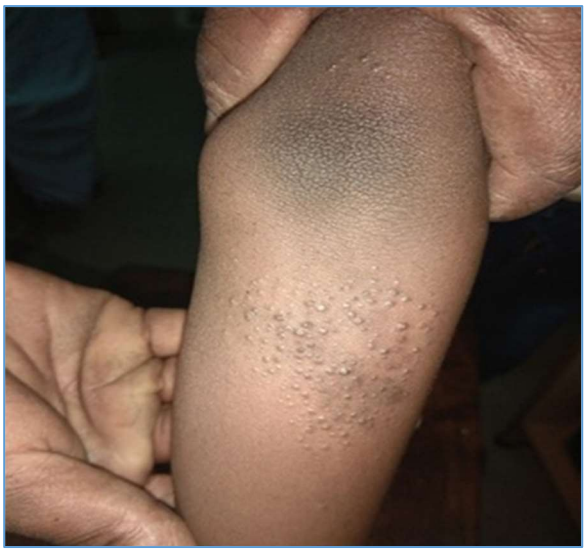

Figure 6: Phrynoderma – multiple pigmented hyperkeratotic papules over bilateral elbows

School studies have included children of 5 to 14 years whereas pre-school children who are in ICDS centres or kindergarten schools have largely been neglected in India. There is one study from Baghdad, the only study that has included the kindergarten children for analysing the pattern of skin diseases comparing two different periods (2011 & 2016).[13] Otherwise, there is no community-based studies to compare the actual pattern and prevalence of diseases with our study.

The present study has shown that the overall prevalence of dermatological lesions among pre-school children attending urban ICDS centres was 8.14% in our part of the state. A study done in Baghdad showed the prevalence of dermatoses to be 34.25% and 32.4% respectively in a span of 5 years which is moderately high when compared to our study. Among the dermatoses in our study population, non-infectious dermatoses accounts to 4.7%, infectious dermatoses accounts to 2.46% and nutritional dermatoses accounts to 0.98%. Frequency of various dermatoses amongst males and females are almost equal and the difference were not significant in our study. In the same way, Baghdad study revealed infectious vs non-infectious dermatoses to be 9.25% vs 25% in 2011 and 21.3% vs 11.1% in 2016. This change of disease pattern with a tilt towards more infections was attributed to the war, population displacement and general unstable conditions of Iraq after 2014.[13] The comparison between various hospital and school-based studies are depicted in **table 4.**

The most common infection we encountered was pityriasis versicolor followed by pediculosis capitis and pyoderma. Among non-infectious dermatoses, mosquito bite allergy (papular urticaria) was the commonest one followed by pityriasis alba and seborrhoeic dermatitis. One genetic condition, a milder form of autosomal dominant ichthyosis (n=2) was also encountered with no deformity and negative family history. Among the nutritional dermatoses, xerosis with phrynoderma was the only finding.

A hospital-based study done in Delhi had showed 48.1% of infectious dermatoses and 51.5% of non-infectious dermatoses among pre-school children which is similar to our study with predominance of non-infectious dermatoses when compared with infectious one.[14] Another study from Wardha, Maharashtra which included all paediatric age group has shown almost equal prevalence of infectious dermatoses and non-infectious dermatoses (50.8% vs 48.4%) which is in contrast to our study.[2]

Recent study done exclusively in pre-school children (n=1712) at a tertiary care hospital in Uttarakhand contributed to infective dermatoses of 50.29% (scabies) and non-infectious dermatoses of 48.78% (eczema).[4] Another hospital based study done in a referral centre of south India (Pondicherry) by Thappa et al also showed increased prevalence of infections than its counterpart (54.5% vs 42.7%).[8] These hospital based surveys are contradictory to our study wherein, our study had high prevalence of non-infectious dermatoses prevailing in the urban ICDS centres in the community. This might be because of fairly good hygiene and socioeconomic condition prevailing in the society, nutritional status among the children in urban region of Tirunelveli provided by nutritional non meal scheme implementation and also health policy followed currently in Tamil Nadu state. Predominantly many studies have shown infectious dermatoses to be more prevalent in the community inferring poor environmental sanitation and lack of self-hygiene. [2,4]

Table 4: Comparison between studies among pre-school children across the country and world

Study	Age (years)	Study population	Place of study	Period & type of study	Overall prevalence	Infections	Non-infectious	Nutritional dermatoses
Delhi, India [14]	1 to 5	13517; M/F 6961/6556	Hospital	6 years Retrospective	-	48.1%	51.5%	0.4%
Wardha, Maharashtra, India [2]	1 to 5	250; M/F 142/108	Hospital	1 year Prospective	-	50.8%	48.4%	0.8%
Uttarakhand, India [4]	0 to 5	1712; M/F 1012/700	Hospital	3 years Retrospective	-	50.29%	48.78%	0.93%
Pondicherry, India [8]	1 to 14	2100; M/F 995/1105	Hospital	1 year Prospective	-	54.5%	42.7%	2.8%
Sao Paulo, Brazil [10]	2 to 5	42; M/F 21/21	Hospital	1.5 years Prospective	-	14.2%	85.3%	0.5%
Zagazig, Egypt [9]	1 to 12	1860; M/F 759/1101	Hospital	1 year Prospective	-	72%	28%	-
Baghdad, Iraq [13]	2011 (3 to 5)	108; M/F 64/44	School	1 month Prospective	34.25%	9.25%	25%	-
	2016 (3 to 5)	108; M/F 55/53	School	1 month Prospective	32.4%	21.3%	11.1%	-
Present study (Tirunelveli, Tamil Nadu, India)	3 to 5	405; M/F 204/201	ICDS urban centers	2 months Prospective	8.14%	2.46%	4.7%	0.98%

Globally, some studies done in developing countries like Brazil show predominant non-infectious dermatoses and Egypt, show predominant infectious dermatoses. These two global studies contradict to each other may be because of climatic differences, state health policy, country's development and other relevant factors like personal hygiene and environment. [9,10]

A study done by the ICDS programme at Gujarat ICDS centres showed moderate malnutrition of 33.6% and severe malnutrition of 1.5%.[19] We did not encounter any such kind of malnutrition among the pre-school children in ICDS centres here as evidenced by anthropometric assessments and physical appearance of the children. Only xerosis with phrynoderma was noted in 4 children accounting for 0.98% implying only a micro nutritional deficiency of vitamin A or essential fatty acids. Since implementation of nutritional noon meal scheme in Tamil Nadu, the percentage of malnutrition has been reducing in the recent years due to the balanced diet provided by them. The concept of supplementary nutrition has also been proved in a study of nutritional intervention in Lucknow and Gujarat by assessing the nutritional status of children in ICDS centres. [15,20]

CONCLUSION

The prevalence of dermatoses among pre-school children in ICDS centres was 8.14% in general with non-infectious dermatoses to be the predominant one than infectious one in this study. Comparatively, lower number of infections reflects the non-contagious environment in spite of the hot climate prevalent in our region, good sanitation, clean environment and good nutritional status prevailing in ICDS centres in our state of Tamil Nadu. Studies in pre-school children at the urban as well as rural community level for skin disorders has never been done before and ours is first of its kind in India. This study could form a baseline data regarding epidemiology of skin disorders in such population which can also be used for future studies in other regions including rural population and different regions of the country to understand more about the changing trends. Health education, regular periodical examination of children, early diagnosis and treatment of the affected will prevent both physical as well as psychological disturbances among the preschool children and can control the outbreak of various skin diseases.

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