International Journal of Medical and Pharmaceutical Research
Website: https://ijmpr.in/| Print ISSN: 2958-3675 | Online ISSN: 2958-3683
NLM ID: 9918523075206676
Volume: 4 Issue:6 (Nov-Dec 2023); Page No: 104-107

Original Article

IJMPR

Changing Trends of Cutaneous Infections and Infestations in Children - A Retrospective Study in a Tertiary Care Center

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ABSTRACT

Background: Dermatological ailments in children contribute to one-third of outpatient visits in the dermatology department. Among these, cutaneous infections and infestations are found to be the most common as per various studies. This study was conducted to find out the commonest cutaneous infections and infestations in children.
Aim: To find out the prevalence and changing trends in the epidemiology of various cutaneous infections and infestations of the pediatric population.
Methods: The medical records of all children aged 0 to15 years who attended the DVL OPD of a tertiary care center for a period of one year from January 2022 to December 2022 were analyzed retrospectively for this descriptive study.
Results: Total number of children who attended the clinicwas1123, among them 587 children were males and 536 were females. A total of 70.97% of infections and 29% of infestations were recorded and among them, fungal infections were54.49% followed by infestations at 29%, bacterial infections at 9.2%, and viral infections at 7.2%.
Conclusions: In the present study, 70% of the children had infections, with fungal infections (54.49%) being the most common type compared to prior studies. We found a change in the trend from bacterial to fungal, which can be attributed to the epidemic-like scenario of dermatophytosis in India.

Key Words: *Pediatric, Infections, Infestations, Changing trends*

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INTRODUCTION

A significant share of dermatological problems includes infections and infestations in the pediatric age group. Children are especially vulnerable due to their underdeveloped immune systems and increased exposure to subclinical infectious carriers at home and school [1].

In many parts of India, factors including poverty, malnutrition, overcrowding, lack of hygiene, illiteracy, and social backwardness do affect the pattern of skin diseases [2]. Infants are confined to households while preschool children aged 1–5 years are exposed to the neighborhood and are at environmental risk. School-going children are more susceptible to communicable diseases [3]. The increase in the residential system of education has also increased the prevalence of communicable diseases. There have been very few studies in the literature on cutaneous infections and infestations in children.

According to studies by RC Sharma et al (1999), bacterial infections were more common two decades ago [1]. However, sangameshwara et al (2020) reported that fungal infections have recently become more common [4]. So the current retrospective study is undertaken to learn about changing trends in the clinical profile of cutaneous infections and infestations in children.

MATERIALS AND METHODS

The medical records of all children aged 0 to15 years and below who attended the DVL OPD of a tertiary care center for a period of one year from January 2022 to December 2022 were analyzed retrospectively for this descriptive study.

Recorded data of clinical history including age, sex, duration of the disease, family history complete dermatological examination, along with appropriate investigations such as KOH examination, Tzanck smear, Gram's staining, pus for culture& sensitivity hematological investigations, biochemical investigations, and skin biopsy, etc. were analyzed.

The data was tabulated and analyzed to determine the gender distribution, age distribution, and prevalence of cutaneous infections and infestations.

ETHICS

The institutional ethics committee approved this study.

RESULTS

In one year a total of33,714 patients visited the clinic, with a pediatric dermatosis prevalence of 1869 (5.93%). Among them, 1123(60.1%) children had infections and infestations. Out of 1123,587(52.27%; n= 1123) were males and the rest 536 (47.72%; n=1123)were females.

Children aged 0 to 1 year were 32 (2.8%) (Birth to Infant), 289 (25.73%) were aged 2 to 8 (Mid childhood) years, 351 (31.25%) were aged 9 to 12 (Pre adolescence) years and 451 (40.16%) were aged 13 to 15 (Early adolescence) years (Table1).

Table 1: Age and sex-wise Distribution

Age in Years	Female	Male	Grand Total
0 to 1	18	14	32
02 to 8	145	148	293
09 to 12	168	189	357
13 to 15	205	236	441
Grand Total	**536**	**587**	**1123**

Out of 1123 children, 797 (70.97%) had infections and 326 (29%) had infestations. Among the infections and infestations, fungal infections were most common, recorded in 612(54.49%) children followed by infestations in 326 (29%), bacterial infections in 104(9.26%), and viral infections in 81(7.21%) (Table2).

Tineacorporis was the most common fungal infection recorded, affecting 381 (33.92%) children followed by tineacruris in 127(11%), and tineacapitis in 14 (1.2%). Tineaversicolor was found in 90 (8.06%) children.

Scabies was the second most common among both infections and infestations, noted in 307 (27%) children followed by pediculosiscapitis in 18(1.6%) female children and cutaneous larva migrans in one child.

Impetigo was the most common bacterial infection, affecting 56(5%) children, followed by periporitis in 27 (2.4%) andleprosy in 10 (0.8%), Furunculosis was found in 5 children, folliculitis in 5, and lupus vulgaris in one.

Viral infections were found in 81(7.21%) children, with HFMD in 24 (2.1%), verruca vulgaris in 23(2%), and Molluscumcontagiosum (MC) in 17(1.4%), Varicella in 12 (1%), Herpes Zoster in 4 and Herpes simplex in 1.

Table 2:

Age and Sex wise incidence of Various Infections and Infestations in Children										
Age In Years		0 to 1		02 to 8		09 to 12		13 to 15		Grand Total
Infection type	Full Name	Female	Male	Female	Male	Female	Male	Female	Male	
Fungal	Tinea Corporis	2	3	27	25	53	56	107	108	381
	Tinea Cruris	0	0	10	9	16	15	36	41	127
	Tinea Versicolor	0	1	7	4	31	13	19	15	90
	Graypatch	0	0	3	2	0	0	0	0	5
	Black Dot	0	0	3	1	0	0	0	0	4
	Kerion	0	0	2	1	0	0	0	0	3
	Favus	0	0	1	1	0	0	0	0	2
		2	**4**	**53**	**43**	**100**	**84**	**162**	**164**	**612**
Infestation	Scabies	5	5	51	64	32	64	31	55	307
	Pediculosis Capitis	0	0	1	0	12	0	5	0	18
	Cutaneous Larva Migrans	0	0	0	0	0	1	0	0	1
		5	**5**	**52**	**64**	**44**	**65**	**36**	**55**	**326**
Bacterial	Impetigo	4	2	12	13	9	10	2	4	56
	Periporitis	0	0	4	8	2	13	0	0	27
	Hansen Disease	0	0	1	1	2	1	3	2	10
	Furunculosis	0	0	1	1	1	1	0	1	5
	Folliculitis	1	0	1	1	1	1	0	0	5
	Lupus Vulgaris	0	0	0	0	1	0	0	0	1
		5	**2**	**19**	**24**	**16**	**26**	**5**	**7**	**104**
Viral	Hand Foot Mouth Disease	3	3	8	7	0	3	0	0	24
	Verruca Vulgaris	0	0	3	6	3	5	1	5	23
	Molluscum Contagiosum	3	0	7	3	2	2	0	0	17
	Varicella	0	0	3	1	3	2	1	2	12
	Herpes Zoster	0	0	0	0	0	2	0	2	4
	Herpes Simplex	0	0	0	0	0	0	0	1	1
		6	**3**	**21**	**17**	**8**	**14**	**2**	**10**	**81**
Grand Total		**18**	**14**	**145**	**148**	**168**	**189**	**205**	**236**	**1123**

DISCUSSION

Cutaneous infections and infestations are common in children and cause great concern for both the children and their parents. These can range in severity from minor skin problems to major infections, and if not properly diagnosed and treated early, they can cause significant morbidity [5].

Numerous factors can influence the prevalence of skin infections mentioning geographical, cultural, educational, nutritional, and socio-economic factors, overcrowding, lack of hygiene, and environment [6].

In the present study,70% of children had infections, and 29%of infestations were due to parasitic organisms (Table 2). This is comparable with the study done by Karthikeyan et al, who reported 69% infections and 30% infestations.

Male children constituted 52.27% of the study population and females 47.72% (Table 1). The study done by R C Sharma et al had 58% males and 42% females. Male to female ratio of 1.07: 1.6 was nearly equal, according to Sardana K, Mahajan S, et al.

In the present study, 32 children belonged to the age group of 0 to 1 year followed by 289 children in 2 to 8 years. 351 children were in the age group of 9 to 12 years and 451 were in the age group of 13 to 15 years (Table 1). Higher incidences of infections and infestations were noted in the age group of 9 to 12 and 13 to 15 years. However, the study by Subramanya Swamy et al. in Kurnool revealed that the age range of 4 to 6 years was associated with the highest frequency of cutaneous infections, followed by 7 to 9 years and 1 to 2 years. The different socioeconomic levels, dietary patterns, and cultural traditions could all contribute to this discrepancy in age group distribution.

Fungal infections (54.49%) were the commonest cutaneous infections encountered in the study followed by infestations (29 %), bacterial (9.2%), and viral (7.2%). According to a study by Sangameshwara et al., fungal infections (57%) were the most prevalent, followed by viral and bacterial infections. In other studies, the incidence of fungal infections was reported by MS Swamy et al 29%, Karthikeyan et al 15%, Agarwal et al 19%, and RC Sharma et al 8%. These variances in studies may result from differences in temporal, geographical, and cultural contexts.

In the present study, tineacorporis (33.92%) was the most frequent fungal infection followed by tineacruris (11%), tineaversicolor (8%), and tineacapitis (1.2%). High humidity and hot weather, which cause increased perspiration, may be the contributing factors to these fungal infections. Furthermore, the majority of the children with tineacorporis had recorded a family history of one or more adults in their household with fungal disease. Increased incidence due to changing clothing patterns, expanded residential educational system, excessive perspiration during academic and athletic activities, as well as wearing the school uniform and shoes for a lengthy time, fomite transfer through the soaps and towels, and washing all of the clothes together could be the source of infection.

Infestations were the second most common, with scabies accounting for (27%) of cases, followed by pediculosis in (1.6%) and results were consistent with Karthikeyan et al (30%).Besides that MS Swamy et alKiran B. Patel et al reported infestations(19%,19.46%) respectively in their studies. Incidence of scabies varied from 5.1% by Negi et al to 22.4% in various other studies [7].Schoolmates and playmates were noted as a source of scabies, and overcrowding and improper medication were identified as significant risk factors. Pediculosisis most commonly seen in female children due to the length of hair, and poor hair hygiene, particularly in school-going children. Fewer cases of pediculosiscapitis were reported in comparison to studies based on school surveys. The majority of children were probably already receiving treatment and using conventional treatments as a significant factor.

The most prevalent bacterial infection was impetigo followed by periporitis, folliculitis, furunculosis, leprosy, and lupus vulgaris. Bacterial infections were the most prevalent according to Radha Sharma et al (36.5%) and MS Swamy et al (52%) while in our study incidence was 9.2%. This may be related to the widespread use of antibiotics for various other conditions as over-the-counter treatments, which has resulted in a decrease in the occurrence of bacterial infections. Leprosy incidence in children is concerning since it implies a higher frequency of disease transmission in the general population [2].

When compared to other infections, viral infections (7.2%) were less frequent, with HFMD (2.1%), being the most prevalent followed by verruca vulgaris (2%), MC (1.5%), and varicella (1.2%). According to studies conducted by Chandrashekaran et al (42%), and Karthikeyan et al 2004 (8%) viral infections were the most common, with MC and verruca being the most common.

Tabel 3:

Comparative epidemiological profiles of cutaneous Infections and Infestations in Children					
Publication	Fungal Infections (p)	Bacterial Infections(p)	Viral Infections(p)	Infestations(p)	Geographical Area
RC Sharma et al1999	689 (8.42%)	2784 (34.66%)	315 (3.85%)	4338 (53.66)	New Delhi
Karthikeyan et al2004	181 (15%)	551 (46%)	96 (8%)	358 (30%)	Pondicherry

MS Swamy et al2018	1330 (29%)	2341 (52%)	770 (17%)	2706 (19%)	Kurnool
Agarwal, Komal, et al2022	104 (19.8%)	297 (56.6%)	13 (2.5%)	92 (17.5%)	Kolkata
T.Vani et al 2023(Present study)	612 (54%)	104 (9.2%)	81 (7.2%)	326 (29%)	Vijayawada

(P=prevalence)

Studies conducted two decades ago, such as those by RC Sharma et al research (1999) and Karthikeyan et al study(2004) found that bacterial infections (34%,46%) and infestations(53%,30%) were most prevalent, but according to MS Swamy et al (2018), Agarwal et al (2022),fungal infections(29%,19.8%) have recently become more prevalent.

In line with the findings above, 70% of the children in the present study had infections, with fungal infections (54.49%) being the most prevalent. These were followed by infestations (29%), bacterial infections (9.2%), and viral infections (7.2%). In the current study, we noticed a shift in the trend from bacterial to fungal, which can be attributable to the dermatophytosis epidemic-like scenario in India.

LIMITATIONS

The drawbacks of this study are it is retrospective, observational, hospital-based, and the study may not accurately reflect the characteristics of the general population, and chances of duplicate registration of outpatient attendance.

CONCLUSION

The change in trend from bacterial to fungal infections was caused by the high humidity and hot climate, together with the prevalent clothing pattern, abuse of irrational combination creams containing potent corticosteroids,delayed seeking of specialist treatment, overcrowding, and socioeconomic factors.

The majority of cutaneous infections and infestations, however, are not preventable by vaccine, making it difficult to prevent their transmission. Therefore, controlling cutaneous infections and infestations in children requires improving socioeconomic conditions, changing personal hygiene practices, and implementing the necessary preventive measures.

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