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Epidemiology and Clinical Profile of Pediatric Cutaneous Viral Infections in Eastern India: A Retrospective Study with Comparative Analysis

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Abstract: ***Introduction: Pediatric dermatoses, especially those of viral origin, are a prominent concern in the Indian subcontinent due to their frequency, communicability, and impact on quality of life. These infections not only reflect the hygiene and living standards of a population but also indicate underlying environmental and immunological trends. Aim: This study aimed to assess the clinical profile and frequency of pediatric viral dermatoses in a tertiary healthcare center in eastern India and to interpret these findings within the broader context of existing national literature. Materials and Methods: This retrospective, descriptive study analyzed data collected from pediatric dermatology outpatient records from January 2023 to December 2024 at a tertiary care hospital in Ranchi, Jharkhand. All children aged 0–14 years diagnosed with viral dermatoses were included. Clinical diagnoses were based on morphology, supported by laboratory techniques such as Tzanck smears and viral serology where necessary. Statistical analysis included descriptive metrics. Results: Of the 79,732 dermatology outpatient visits recorded during the two-year study period, 7035 involved pediatric patients, comprising 8.82% of total dermatology OPD visits. Of these, 393 cases (5.59%) were identified as viral dermatoses. The most frequent conditions were viral warts (39.9%), molluscum contagiosum (32.3%), varicella (11.7%), hand-foot-mouth disease (7.1%), other viral exanthems (6.9%), herpes simplex (1.3%), and herpes zoster (0.8%). A gender-wise analysis revealed a male predominance (62.6%). Age distribution showed warts and molluscum to be more common in the 6–14 years group, while younger children (<5 years) predominantly suffered from varicella infection, hand-foot-mouth disease and other viral exanthems. Conclusion: Pediatric viral dermatoses form a notable proportion of outpatient dermatological cases. The high frequency of warts and molluscum contagiosum emphasizes the need for awareness and targeted hygiene education. Warts, in particular, showed a varied presentation in our region, often involving multiple sites with a prolonged course and recurrence, which differed from patterns reported elsewhere. Comparisons with data from other Indian states reveal both consistent epidemiological patterns and notable divergences likely driven by regional environmental and socioeconomic differences.***

Keywords: pediatric viral dermatoses, cutaneous infection, molluscum contagiosum, warts, eastern India, Jharkhand

1. Introduction

Pediatric dermatological conditions constitute a major segment of outpatient visits in Indian healthcare settings. Viral infections of the skin in children are especially noteworthy due to their contagious nature, distinct clinical manifestations, and diagnostic challenges. These infections often serve as indicators of prevailing hygienic and socio-economic conditions, like overcrowding, especially in resource-limited settings.[1] India's broad geographic and climatic diversity results in significant variation in dermatologic presentations across regions. Pediatric dermatoses, though often benign, hold significant relevance due to their potential chronicity, impact on psychosocial development, and role in early detection of systemic conditions.[2] Infections are among one of the leading causes of skin disease in children. Viral infections, including warts, molluscum contagiosum, and varicella, have gained prominence in pediatric clinics due to their increasing frequency and ease of transmission. Although various studies across India have attempted to chart the prevalence and distribution of pediatric dermatoses, regional differences persist.[1-6] This underscores the need for focused regional studies. With limited data from eastern part of India, particularly Jharkhand, our study aimed to fill this gap by profiling the epidemiology of pediatric viral dermatoses and offering a comparative interpretation with available literature.

2. Materials and Methods

This was a retrospective, hospital-based observational study conducted at the dermatology outpatient department of a tertiary care teaching hospital in Jharkhand. The study period spanned two years (January 2023 to December 2024). Pediatric patients (aged 0–14 years) diagnosed clinically with viral dermatoses were included. Data was extracted from outpatient registers and electronic records. Clinical diagnosis was based on history and morphological examination. Laboratory confirmation through tzanck smear and viral

serology was utilized in uncertain cases. Patients with incomplete records or who fell outside the age criteria were excluded. Relevant clinical history was noted in multiple patients, such as familial occurrence of warts, exposure through schools or playgrounds, use of shared towels or footwear, and history of recurrent infections. Ethical clearance was obtained from the Institutional Ethics Committee, and informed consent was secured from the parents of the patients. Data were analyzed using Microsoft Excel and SPSS for descriptive statistics such as percentages and proportions and were used for graphical representation.

3. Results

Out of the total 79,732 dermatology outpatient visits, 7035 were pediatric consultations (8.82%). Among these, 393 (5.59%) presented with one or more viral dermatoses. In our study males out-numbered females. Males comprised 246 (62.6%) of these cases while females comprised 147 (37.4%) of the cases forming a ratio of 1.67:1. Warts were the most common viral dermatoses, noted in 157 patients (39.9%). Epidemiologically, warts in our cohort were frequently associated with barefoot walking, communal bathing, and repeated trauma to the skin. Clinically, patients presented with verruca vulgaris (n=104) most commonly on the hands and feet. Several cases showed periungual and plantar (n=25) involvement. In approximately 20% of the cases, there was a positive family history of similar lesions, suggesting close-contact transmission within households. A small subset (12 cases) reported recurrences despite prior cauterization or topical salicylic acid application, pointing toward treatment resistance and possible immunological predisposition. Molluscum contagiosum accounted for 127 cases (32.3%), typically manifesting as grouped umbilicated papules on the face, trunk, and extremities. History revealed frequent sharing of towels and soaps among siblings. Varicella, seen in 46 cases (11.7%), presented with generalized vesicular eruptions and systemic symptoms such as fever. It was more common in 6 to 10 year age group and a history of similar lesions in close contacts were present in majority of the cases. Hand-foot-mouth disease (HFMD) seen in 28 cases (7.1%) was prevalent among children under 5 years, often linked to outbreaks in preschool settings. Other viral exanthems (6.9%) comprised of nonspecific viral rashes including those from measles and rubella. Less frequently, herpes simplex (1.3%) and herpes zoster (0.8%) were documented. In age distribution, children aged 6–14 years accounted for most wart and molluscum cases, reflecting increased peer contact and recreational exposure and by contrast, exanthems, HFMD, and varicella predominated in younger children (Table 1), who are more vulnerable due to immature immune responses and daycare exposures.

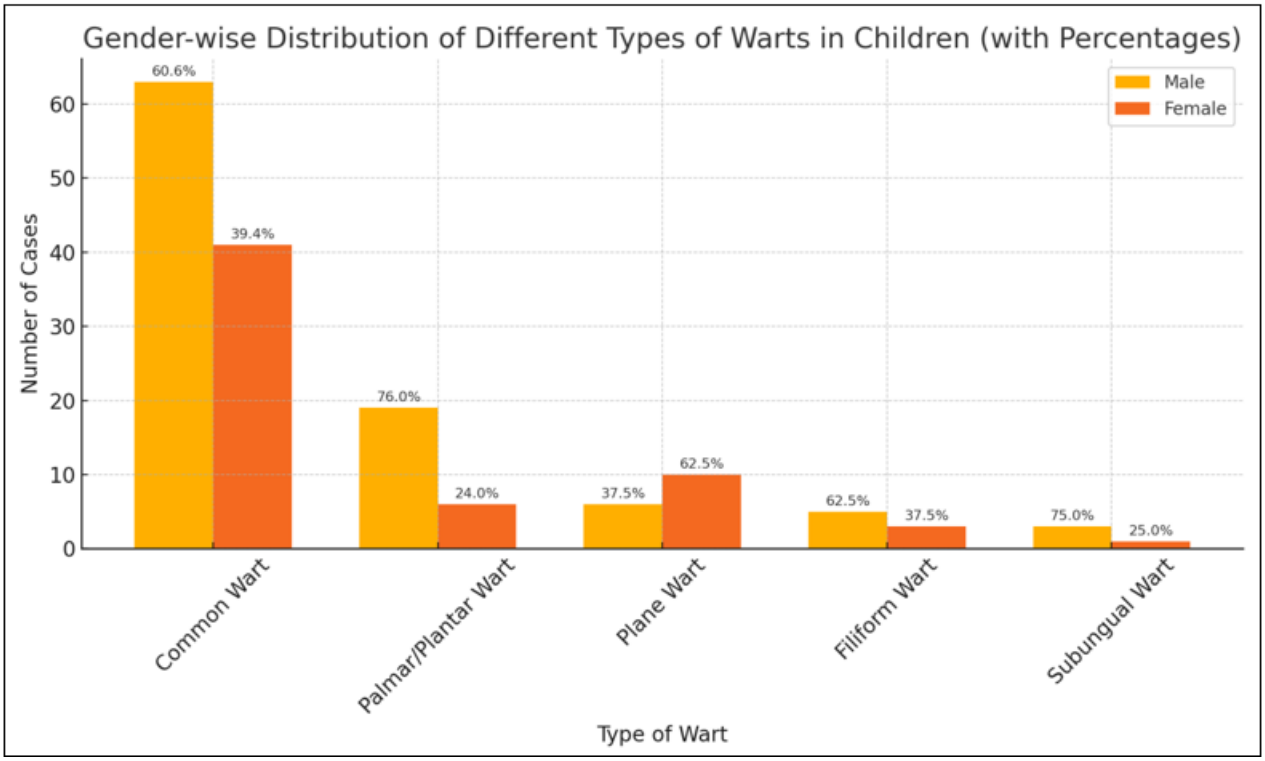
Across all wart types, common warts dominated the clinical spectrum, especially in school-aged and early adolescent boys. Male children accounted for 61.15% of total wart cases, suggesting both behavioral and possibly immunological factors at play.The findings suggested a clear male predominance across most wart types, with the exception of plane warts, where females were relatively more affected in older age groups. The 11–14 years group consistently showed the highest incidence across nearly all wart types, aligning with increased social interaction and exposure risk. Common warts were overwhelmingly dominant, followed by palmo-plantar and plane warts. These findings reinforce the role of age-appropriate hygiene education, surveillance in schools, and early parental awareness to curb transmission and improve outcomes in pediatric viral warts.

A seasonal trend was observed in our study in the occurrence of some these viral dermatoses among pediatric patients. Varicella showed a bimodal pattern, with a minor increase in cases during the winter months and a more prominent rise during the post-monsoon to early winter period, particularly in the months of September to November. Hand, foot, and mouth disease (HFMD) demonstrated a scattered distribution throughout the year but tended to cluster during the late monsoon and winter months, especially from October to December. Similarly, other viral exanthems exhibited a marked increase during the post-monsoon season, with a peak in late autumn and early winter. These patterns indicate a higher incidence of viral exanthematous diseases in children during the post-monsoon and winter seasons**,** likely due to climatic factors favoring viral survival and transmission, along with increased indoor congregation during cooler weather.

Table 1: Age and gender distribution of different viral dermatoses

S. No	Viral dermatoses	Age group (year)	Male	(%) Male patients	Female	(%)Female patients	Total	(%) out of total patients
1.	Molluscum Contagiosum	≤5 years	22	59.46	15	40.54	37	9.41
		6-10y	30	61.22	19	38.78	49	12.48
		11-14y	29	70.73	12	29.27	41	10.43
Molluscum patients out of total (393)							**127**	**32.32**
2.	Wart	≤5 years	14	60.87	9	39.13	23	5.85
		6-10y	28	63.64	16	36.36	44	11.19
		11-14y	54	60	36	40	90	22.90
Wart patients out of total (393)							**157**	**39.95**
3.	Varicella	≤5 years	8	61.54	5	38.46	13	3.31
		6-10y	19	70.37	8	29.63	27	6.87
		11-14y	4	66.67	2	33.33	6	1.53
Varicella patients out of total (393)							**46**	**11.70**

4.	HFMD	≤5 years	9	56.25	7	43.75	16	4.07
		6-10y	6	60	4	40	10	2.54
		11-14y	2	100	0	00	2	0.51
HFMD patients out of total(393)							**28**	**7.12**
5.	Viral Exanthema	≤5 years	11	68.75	5	31.25	16	4.07
		6-10y	7	63.64	4	36.36	11	2.79
		11-14y	0	00	0	00	00	000
Other Viral exanthems out of total(393)							**27**	**6.87**
6.	Herpes zoster	≤5 years	0	00	0	00	00	000
		6-10y	1	50	1	50	2	0.51
		11-14y	0	00	1	100	1	0.25
Herpes zoster patients out of total(393)							**3**	**0.76**
7.	Herpes simplex	≤5 years	0	00	1	100	1	0.25
		6-10y	2	50	2	50	4	1.02
		11-14y	0	00	0	00	0	000
Herpes simplex patients out of total(393)							**5**	**1.27**
Total Patients:			**246**	**62.6**	**147**	**37.4**	**393**	**100**



Graph 1: Representation distribution of various warts according to gender and age.

4. Discussion

Our findings closely align with other Indian studies in certain aspects but differ in others, which may be attributed to regional variations, environmental conditions, or differences in healthcare-seeking behavior. In a study Ghosh et al. reported that molluscum contagiosum and viral warts were the predominant viral infections in their study. [6] This aligns with our findings in terms of molluscum contagiosum and viral warts being the most common viral dermatoses; however, it differs in the sequence, as warts were the most frequently observed condition in our study, followed by molluscum. This variation might be explained by differences in school hygiene practices and surveillance systems. Some states have a better-established school health system, which may lead to earlier recognition and reporting. In contrast, a study from northeast India by Nagarajan et al. and another one by Shreevastav identified varicella and herpes zoster as leading viral infections. [3,4] School-based surveys across different regions of India have reported the prevalence of pediatric dermatoses to range between 8.7% and 35%.[1,2] Our slightly lower percentage (5.59%) could reflect underreporting due to lower health awareness or preference for traditional medicine in rural Jharkhand. Podder et al., in their study from West Bengal, observed that viral infections were less common (around 2.5%). [5] This stark contrast could be due to demographic differences; their study included a high proportion of urban

subjects with better hygiene and vaccination coverage. [5] Moreover, regional climatic differences such as higher humidity in Bengal might alter transmission dynamics of certain viral infections. In a study done by Jain et al. which analysed the various pediatric dermatoses across India, highlighted scabies, pyoderma, and pityriasis alba as leading causes, with viral dermatoses forming a relatively small fraction,[2] and the data collected a decade earlier reflects an era with different public health priorities and diagnostic capabilities.

The predominance of viral warts in our study could also be attributed to poor hand hygiene, barefoot walking, and sharing of personal items among children. The clinical picture of warts varied, with most presenting as multiple discrete hyperkeratotic papules and plaques. Several children reported prior unsuccessful treatments and had psychological distress in the children and their parents due to the chronic nature of the lesions. This is significant as it suggests both a treatment gap and a need for caregiver education. Molluscum contagiosum's high prevalence may stem from close-contact activities in schools, combined with limited parental awareness of contagious skin lesions. The gender disparity observed mirrors previous findings[2-4] possibly due to boys engaging more frequently in outdoor play and having greater exposure to shared equipment and surfaces. The psychosocial impact of visible dermatoses like warts and molluscum should be emphasized. While these are not life-threatening, the stigma attached—particularly when affecting visible areas like the face and hands—can lead to significant distress in children and their caregivers. Recent literature, including study by Vidaurri et al., has discussed the role of genetic susceptibility and atopy in determining the severity and recurrence of certain viral skin conditions.[7] However, such advanced profiling is often inaccessible in resource-limited settings, necessitating reliance on clinical acumen. The limited use of antivirals or biologics in pediatric dermatology is partly due to cost barriers and lack of pediatric-specific trials. As such, treatment remains largely symptomatic and supportive.

The findings of the current study are consistent with those reported from other regions in eastern India, reaffirming that post-monsoon and early winter seasons are associated with increased incidence of viral dermatoses in children.[6] This correlation highlights the role of climatic and environmental factors in the epidemiology of pediatric viral skin conditions.

5. Conclusion

This study provides critical insight into the burden and distribution of pediatric viral dermatoses in Jharkhand. Warts and molluscum contagiosum remain the leading infections, followed by varicella, HFMD and other viral exathems. Our results are consistent with other regional studies in some areas while deviating in others, likely due to socio-environmental and healthcare infrastructure differences. To reduce the burden of these infections, awareness programs on hygiene and infection control are vital. School health initiatives, periodic dermatologic screening, and parental education can play transformative roles. Special attention should be paid to recurrent and resistant warts, as these not only affect physical health but also mental well-being. Future studies should focus on molecular epidemiology and the impact of emerging infections in pediatric dermatology.

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Declaration of Conflict of Interest: No conflicts of interest

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