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Prevalence of Scabies among Remote Tribal School Children in Central India

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Abstract **Original Research Article**

Background /objectives: Scabies a skin infestation which has been included by World Health organization in the list of neglected tropical diseases is one of the commonest debilitating dermatological conditions affecting tribal school children in central India. ***Methods:*** This cross-sectional study was performed on primary and secondary schoolchildren in a remote tribal area of Ramtek Taluka in Central India. A predesigned questionnaire was used for data collection from all of available tribal school children, and a thorough clinical dermatological examination was done to look for scabies and co-morbid conditions. ***Results:*** Out of 585 school attendees only 400 children were studied, there were 100 cases of scabies with a prevalence of 25%. The prevalence of scabies infestation in female students was 37%, while it was 63% in males respectively, which was found highly statistically significant. The results showed significant variations in the risk of scabies infestation by factors such as demographic co-relates, habits such poor general hygiene, co-morbid conditions, night itch, secondary infection etc. were found to be highly significant with p value <0.001, where as type of housing, type of community, sharing bed or clothes with others or even bathing, sun-drying clothes and use of soap had no significant effect. ***Conclusion:*** In our rural tribal communities, scabies is an extremely important health problem affecting school children, especially in remote areas. It is a complex mesh work of causation, enhanced by poor awareness, appalling living conditions in residential schools and low level of general hygiene.

Keywords: Children,prevalence,scabies,schools skin,tribal.

INTRODUCTION

Scabies is a Latin word, simply means to scratch and is caused by the mite *Sarcoptes scabeii* Scabies and secondary infections are often thought of as irritating diseases, but have the potential to cause a great deal of morbidity and even mortality if infection becomes complicated [1]. Infestation with genus Sarcoptes scabiei hominis may be a common human parasitic affliction endemic in tropical developing countries. Infection is transmitted by person–person contact, and outbreaks are seen in reception centers for asylum seekers. Scabies infestation presents clinically as extraordinarily pruritic excoriated papules and linear burrows within the skin. This infestation predisposes to microorganism skin infections that may end in serious complications in the kidneys and presumably the heart [2]. The first challenge is to raise the profile of this ubiquitous but largely ignored disease [2, 21]. Socioeconomic standards, low level of education and poor hygiene. Risk factors are young age, presence of many children in the shelter, illiteracy, low family income, poor housing [4], sharing clothes and towels, and irregular use of shower. Scabies remains one of the commonest of skin diseases seen in developing countries. Scabies causes rash and severe itch and predisposes to serious infection and chronic diseases of the heart and kidneys. "Despite scabies being an ancient disease found in all parts of the world, we currently lack reliable laboratory tests [5]." Clinicians generally make an assessment based on history and skin examination." It is hoped the 2018 IACS Criteria for the Diagnosis of Scabies will allow harmonization of diagnosis and reporting, and comparison between studies of scabies burden and treatments."Infestation with Sarcoptes scabiei var. hominis is a common human parasitic affliction

endemic in tropical developing countries. Scabies is transmitted by close person–person contact, and outbreaks have been reported in reception centers for asylum seekers. Scabies presents clinically as extremely pruritic excoriated papules and linear burrows in the skin." This infestation predisposes to bacterial skin infections that can result in serious complications affecting the kidneys and possibly the heart [2]." Treatment of individuals with scabies and their close contacts involves the use of anti parasitic agents. First-line treatment is topical 5% permethrin cream. Community mass drug administration, followed by active case finding with targeted treatment, is a promising approach that can reduce the prevalence of both scabies and bacterial skin infections." Organizations such as the International Alliance for the Control of Scabies are advocating for the development of integrated disease control strategies in an effort to decrease scabies infestation worldwide [5]." The disease distribution is subject to a cycle of infection, with highs and lows of disease prevalence in poor communities. The most epidemiologically important seem to be the infectious types because of their transmissibility and possibility to simple school-health measures [6]. iScabies is a neglected tropical disease affecting more than 130 million people, with phenomenal costs on health care systems worldwide" [7]. In 2017, scabies and other ecto-parasites were included as Neglected Tropical Diseases (NTDs), in response to requests from Member States and the recommendations of the WHO Strategic and Technical Advisory Group for NTDs" [8, 9]. Scabies is one of the commonest dermatological conditions, accounting for a huge proportion of skin disease in developing countries [10]. Prevalence estimates in the recent scabies-related literature range from 0.2% to 71%.Scabies is endemic in many resource-poor tropical settings, with an estimated average prevalence of 5 – 10% in children [11]. Outbreaks of scabies have also been reported in institutional settings. Apart from a very itchy rash, scabies can lead to secondary bacterial infections and related complications, as well as to stigmatization, depression, insomnia and significant financial costs [12]. Recurrent infestations and secondary infections are common. A study demonstrated an increased risk of PA (adjusted hazard ratio 1.51) among patients with scabies. Immune-mediated inflammatory processes may contribute to this association [13]. The sheer burden of scabies infestation and its complications imposes a major cost on individual as well as government health-care systems [8]. In 2015, it was estimated that the direct effects of scabies infestation on the skin alone led 0.21% of disability-adjusted life-years (DALYs) from all conditions globally. The indirect health impact of scabies complications, including bacterial infection, renal and cardiovascular disease may be far greater. Scabies and impetigo are common important and treatable skin conditions. Reports from several Pacific island countries how extremely high prevalence of these two conditions [6]. Human scabies remains one of the most frequent skin diseases in resource-poor countries. The disease is transmitted through direct and prolonged contact with an infected skin, or rarely by using contaminated personal objects. It has a significant impact in terms of cost of treatment, absenteeism from school and severe psychological and social repercussions [14]. Largely through the association with secondary bacterial infection caused by group A streptococci and Staphylococcus aureus, the burden of disease is inflated by nephritis, rheumatic fever and sepsis in developing countries. Outbreaks of scabies can occur in either closed, institutional settings (such as hospitals, boarding schools or long-term care facilities) or rural settings. Refugee or migrant colonies are at particularly high risk, as the overcrowding typically present in such colonies increases skin to skin contact between infested and uninfested individuals [15]. However, it remains an extremely neglected public health problem. The purpose of this study is to provide an update on the current position of scabies with regard to its complications and control in a resource-poor setting. Underlying risk factors, such as poverty, overcrowding and lack of access to clean water, while improving access to health care, should help to reduce the burden of this disease in Indigenous communities [12]. The objectives of the study were, to study the prevalence of Scabies and the socio-demographic co-relates influencing scabies in remote tribal school children in Central India

METHODS

Study area is Tribal school of Ramtek Taluka and the Study population is all the school children present in the school during the period of study. The study design is a cross sectional study, done for a period of one year. Random Sampling method was used for selection of one school out of 196 schools and universal sampling done to include all the students studying in that school

Inclusion criteria was all children present in the school at the time of school health examination and the Exclusion criteria was all those children who are not willing to participate in the study or were absent during the period of study. Statistical analysis was done using Epi-info software version 7.1.1.14

A cross-sectional study was conducted in the Tribal School of Ramtek Taluka, in Central India after obtaining approval from Institutional Ethics Committee. The School children were interviewed with the help of pretested predesigned questionnaire for their socio-demographic data and risk factors related to scabies. A personal interview with the school children elicited personal hygiene habits followed by clinical dermatological screening and health education.

Scabies standard clinical diagnostic criteria used was itching at night, Follicular lesions, secondary infections leading to crusted papules, pustules and

proximity to other members affected. Examination of the skin focused on bodily regions most commonly affected by scabies and impetigo [16]. Skin scrapings or microscopy were not available to confirm the diagnosis. Students found infected received anti scabies medications made of permithrin ointment and permithrin soap which was given free of charge. Additionally, the bedding and laundry were instructed to be disinfected with regularly in bright sunlight. Teachers were also examined but not included in the study and were given a health education session on prevention, detection and control of scabies. A physical examination was independently undertaken by two experienced health workers and the author. The diagnosis was ascertained, based on a clinical assessment. Accordingly, a student complaining of pruritus, on whom scabies lesions were notified at least at two specific body sites with or without history of pruritus but has history of night itch was declared suffering from scabies.

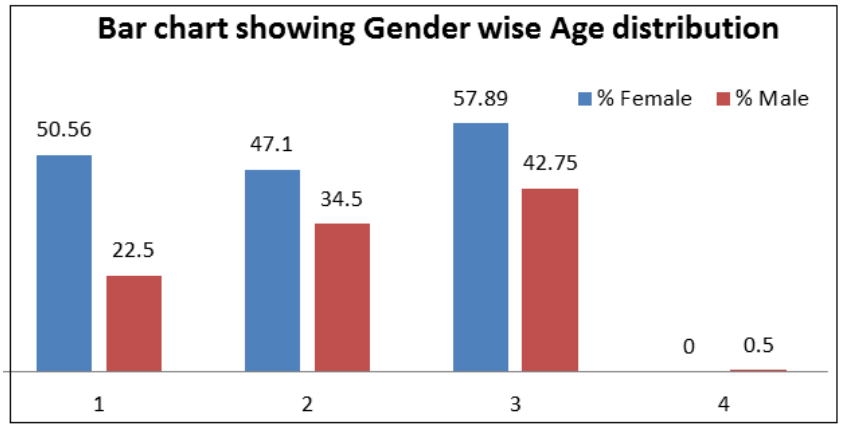
RESULTS

Table: Age and sex distribution of participants

Age group with code		Female N=209(%)	Male N=191(%)	Total N=400(%)
5-10	**1**	45(21.53)	44(23.04)	89(22.25)
10-15	**2**	65(31.10)	73(38.21)	138(34.50)
15-20	**3**	99(47.36)	72(37.70)	171(42.75)
20-25	**4**	0(0.00)	2(1.05)	2(0.50)

Min: 6, max: 23, mean age: 13.37, SD= 3.58 Female (52.25), Male (47.75)

Age and sex distribution showed that of the total number of participants, 209, 52. 25 % were girls and 191, 47.75%, were boys of which 21.53% and 23.04% in the age group of 5-10years, 31.10% and 38.21% in 10 to 15 years, 47.36% and37.70% in 15 to 20 years were girls and boys respectively and only 2 boys above 21 years of age. In our study only 22.25% from 5-10yrs in which 50% were girls and boys. Where as a study by Ishore *et al*., 56.2% were boys and 43.8% were girls with age ranging from 5 to 10 years [17]. A total of 1021 children were enrolled in the study. Total boys were 596 (58.37%) while girls were 425 (41.62%) with a boy to girl ratio 1.4:1 [18].



The bar chart clearly showed that the girls outnumbered boys in all categories of age group except group four which included two boys in the age of 22 and 23 still studying in the tribal school.

Table: Demographic coorelates in participants

Demography	Scabies Absent N=300(%)	Scabies Present N=100(%)	Total N=400 (%)	df	OR	Chi square X^2	P value
Gender							
Female	172(57.33)	37 (37.00)	209(52.25)	**1**	**2.28**	**11.62**	**0.00**
Male	128(42.66)	63(63.00)	191(47.75)				
Education							
I-IX std	150(50.00)	54(54.00)	204(51.00)	1	0.85	0.48	0.48
X-XII std	150(50.00)	46(46.00)	196(49.00)				
Boarding							
Day scholar	122(40.67)	35(35.00)	157(39.25)	1	1.01	0.78	0.31
Hosteller	178(59.33)	65(65.00)	243(60.75)				
Housing							
Kaccha	65(21.67)	18(18.00)	83(20.75)	1	1.26	0.61	0.43
Pucca	235(78.33)	82(82.00)	317(79.25)				
Community							
Nomadic tribe	5(1.67)	5(5.00)	10(2.50)				
OBC*	11(3.67)	6(6.00)	17(4.25)	1	0.96	0.00	0.92
Open category	9(3.00)	0(0.00)	9(2.25)				
Scheduled castes	9(3.00)	0(0.00)	9(2.25)				
Scheduled tribes	266(88.67)	89(89.00)	355(88.75)				

P<0.05 is significant * other backward class OR= Odds Ratio

The demogaraphic data showed that gender played a predominant role in the preponderance of the disease among male students as compared to female students which was 63% and 37 % respectively with an OR of 2.28, X^2 of 11.62 and P<0.00 which was found to be highly significant. All other demographic factors such as primary or secondary education, whether day scholar or hosteller, type of housing or even the communities they belonged to did not show any correlation to the affliction.

Table: General Hygiene and scabies infection among participants

General hygiene	Scabies absent 300 (%)	Scabies present 100 (%)	Total 400 (%)	df	Chi square X^2	P value
Poor	81(27.00)	73(73.00)	154(38.50)	**1**	**67.02**	**0.000**
Good	219(73.00)	27(27.00)	246(61.50)			
Total	300 (75.00)	100(25.00)	400(100.00)			

P<0.001 is considered highly significant

The table showing general hygiene and scabies, 154(38.50%) participants with poor hygiene73% of the participants were afflicted with scabies. As compared to 27% with good hygiene. For 1 degree of freedom the chi square test was 67.02 and p value found to be highly significant.

Table: Habits and Scabies infection among participants

Habits	**	Scabies Present N=100	Total 154 N=400	df	OR	Chi square X^2	P value
Share clothes	**0**	84(84.00)	335(83.75)	1	0.97	0.006	0.09
	1	16(16.00)	65(16.25)				
Share bed	**0**	18(18.00)	77(19.25)	1	1.11	0.134	0.74
	1	82(82.00)	323(80.75)				
Regular bath	**0**	8(8.00)	21(5.25)	1	0.52	2.02	0.15
	1	92(92.00)	379(94.75)				
Soap use	**0**	2(2.00)	3(0.75)	1	0.16	2.79	0.09
	1	98(98.00)	397(99.25)				
Wash clothes	**0**	9(9.00)	22(5.50)	1	0.45	3.14	0.07
	1	91(91.00)	378(94.50)				

P<0.05 is significant ** 0 is NO and 1 is YES

The table showing habits and correlation to Scabies, none of the habits such as sharing clothes, sharing bed, regular bath soap use or washing of clothes showed any significant findings contrary to beliefs. Of the children with scabies, 16% shared clothes, 82% shared bed,92% bathed regularly, 98% used soap for washing themselves and 91 % washed clothes regularly.

Table: Co morbid conditions along with scabies in participants

Comorbidity	**	N=400 absent N=300(%)	Scabies Present N=100 (%)	D f	OR	Chi square X^2	P value
Co morbid Conditions*	**0**	156(52.00)	74(74.00)	1	0.38	14.9	**0.00**
	1	144(48.00)	26(26.00)				
Lymphnodes	**0**	296(98.67)	95(95.00)	1	3.89	4.58	0.07
	1	4(1.33)	5(5.00)				
Night itch	**0**	299(99.67)	22(22.00)	1	1060.09	280.56	**0.00**
	1	1(0.33)	78(78.00)				
Pyrexia	0	298(99.33)	97(97.00)	1	4.60	1.68	0.19
	1	2(0.67)	3 (3.00)				
Pediculosis	0	285(95.00)	93(93.00)	1	1.43	0.57	0.44
	1	15(5.00)	7(7.00)				
Secondary infection	**0**	296(98.67)	81(81.00)	1	17.35	43.19	**0.00**
	1	4 (1.33)	19(19.00)				

P<0.001 is considered highly significant** 0 is NO and 1 is YES* others like anemia, URI, ARI, tonsillitis

Co morbid conditions such a URI, UTI, ARI, Injuries, Anemia, generalized debility, vitamin B complex deficiencies, sinusitis, Head ache etc were found to be significantly higher ie P value < 0.001, in children suffering from scabies. Other significant finding with OR of 1060.09 and 17.35, chi square values of 280.56 and 43.19 for Night itch and secondary infection respectively of infested site was found to be highly significant suggesting that these are very much a presentation of the disease per se. lymphnodes enlargement, pyrexia and pediculosis did not show any significant association. Dimri *et al*., found that among the infections of the skin and subcutaneous tissue the most common was fungal infection (46.8%) followed by scabies and viral and bacterial skin diseases. Tinea dermatoses constituted 76.4% of all fungal infections. Of the total patients 16.9% were affected by dermatitis and 16.7% by acne. Psoriasis, urticaria, melasma, and vitiligo were present in 3.4%, 3.4%, 3.6%, and 3.3% patients, respectively (Table-2) [19]. The association between scabies and skin sores is highly significant and indicates a causal relationship [20].

DISCUSSION

In this study the prevalence was 25% in a study by Koutou *et al*., the prevalence of scabies was 17.8% [21]. which was lesser than our findings. Some findings by authors [22] and Pruksachatkunakorn C, *et al*., range a prevalence of 67%to 87.5% in Sierra Leone and orphanages in Thailand respectively. Scabies prevalence was (39.42% or 41 students) in students of primary school in kolkata [23], Out of 2,104 children studied, there were 92 cases of scabies with a prevalence of 4.4%. The prevalence of scabies infestation in male students was 3.9%, while it was 4.8% in females, with no statistical significance [24]. General observation was roll numbers of serial order seem to be more affected due to proximity. The burden of scabies is greater in tropical regions, especially in children, adolescents, and elderly people. As a worldwide epidemiological assessment, GBD 2015 provides broad and frequently updated measures of scabies burden in terms of skin effects [22]. the demographic factors excepting for gender had no particular correlation in this study.No particular effect was found of the type of housing as described Houses made with high quality materials throughout, including the floor, roof, and exterior walls, are called pucca houses. Houses made from mud, thatch, or other low-quality materials are called katcha houses [25].

Morbidity was found to be quite high among the tribal children [17]. Mean hygiene score was significantly higher in girls (4.32) than boys (3.95) and poor hygiene observed in older boys [17]. Nonetheless, we observed that these students were more prone to bathe less than twice daily compared to their counterparts (P=0.019), showing perhaps that they had a poorer personal hygiene which can therefore explain the results [14]. We found that, 19% of the scabies infected had secondary infection as compared to only 1.33% in children with no scabies. Aung et al found that when infected with scabies, children were 12 times more likely to develop skin sores than in the absence of scabies infestation which reiterates the extreme burden of skin disease in remote Aboriginal and Torres Strait Islander communities, with up to 75% of children [20]. Some of the lesions had developed suppurative secondary bacterial infections. Nearly 10% of cases had pyoderma from secondary bacterial infections [26]. The results showed significant variations in the risk of scabies infestation by factors such as residence, paternal education and occupation, maternal education, sleeping with others, having animals at home, dealing with animals outside the house, type of building for living, family history of itchy rash, and sharing clothes with others [24]. Increased global awareness of the burden from scabies will promote international efforts for control of this preventable disease [22].

CONCLUSION

In our rural tribal communities, scabies is an extremely important health problem affecting school children, especially in remote areas. It is a complex mesh work of causation, enhanced by poor awareness, appalling living conditions in residential schools and low level of general hygiene, foremost is the early identification of index case and their isolation to prevent spread.

Abbreviations: NTD- Neglected Tropical diseases.

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Conflicts of Interests: The author declares that no competing interests whatsoever.

Ethics Approval and Consent to Participate

Participants were students, regardless of their level of education, currently residing in the boarding school or attending the school from nearby tribal villages. Prior to commencing this study, institutional authorization was obtained from the ethical committee of the tertiary care medical institute. Consent forms were sent to each student through their respective class teachers, presenting all the aspects and procedures of the study, and we enrolled only students whose guardians returned a signed consent form, hence authorizing the investigators to include the child in the study. The present study did not, interfere with the routine curriculum. Those students who did not take part on the first phase were examined and questionnaire filled in the second phase so as not to miss out any incident cases of scabies due to their absence.

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