

Socio-demographic determinants of scabies and association of scabies with other diseases: A cross-sectional study from rural India

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ABSTRACT

Background: Scabies is a parasitic disease caused by a mite called *Sarcoptes scabiei*. It is a public health problem in developing countries including India. The present study was planned to assess the prevalence of scabies among different socio-demographic groups and to find out the association of scabies with other diseases related to unhygienic environments.

Materials and Methods: The study was conducted among children aged 6–14 years in a rural area of West Bengal, India. It was a community-based cross-sectional study. The children underwent medical checkups to assess the presence of scabies, diarrhea, boil, ringworm infestation, eczema, and respiratory tract infections. Stool examination was performed to assess the presence of amoebiasis and giardiasis. History was taken from the mothers about the occurrence of diarrhea and respiratory tract infections in last 15 days. After data collection, it was compiled, tabulated and analyzed in SPSS version 16.0.

Results: The overall prevalence of scabies was found to be 42%. The prevalence of scabies was significantly higher among with low per capita monthly income and among children with a larger number of siblings. The prevalence of scabies was significantly higher among children whose mothers were illiterate. Scabies was significantly associated with diarrhea, amoebiasis, giardiasis, boil, ringworm infestation, and respiratory tract infections.

Conclusion: The present study revealed the socio-demographic factors associated with scabies and also indicates that the diseases which are related to unhygienic conditions are also associated with scabies.

Key words: Scabies, *Sarcoptes scabiei*, Unhygienic condition

INTRODUCTION

Scabies is a contagious skin infection caused by a mite named *Sarcoptes scabiei*. The World Health Organization (WHO) has classified scabies as a water-borne disease. Scabies is very common in India.¹ The prevalence of scabies is high particularly during the winter season as described by Sokolova et al.² The prevalence of scabies is also very high in some areas (according to Andrews et al.³ and McDonald et al.⁴). The approximate number of infected people around the world is estimated to be near about 300 million according to Chosidow.⁵ The prevalence varies widely from country to country and it ranges from 0.2% to 24% according to a review done by the WHO.⁶ One study from a rural Indian village in 1977 found the prevalence to be as high as 70% as described by Nair et al.¹

Scabies is often associated with secondary bacterial infection by *Streptococcus* and *Staphylococcus aureus* and sometimes it is associated with pyoderma as described by WHO in 2005.⁷ Many social factors are associated with scabies. Overcrowding and climate change are often considered to be associated with scabies as described by a study from New Zealand by Andrews and another study conducted in Edinburgh by Savin.^{8,9} Christophersen also reported similar findings in Denmark.¹⁰ The highest rates of scabies in developing countries are seen in pre-school children and adolescents as described by Burkhart et al.¹¹ In this context, the present study was conducted in a rural area of India to assess the prevalence of scabies among different socio-demographic groups and to find out the association of scabies with other diseases related to unhygienic environments.

MATERIALS AND METHODS

The study was conducted in Rasulpur village of Singur block of Hooghly district, West Bengal, India. The area is situated in eastern India and the village is approximately 50 km away from the metropolitan city of Kolkata. Majority of people are farmers and laborers in this village. A large group of people go to Kolkata every day for earning their livelihood. A majority of the population is Muslim and belongs to the lower middle or upper lower socioeconomic status according to the Prasad Scale.

It was a community-based cross-sectional study. The study included children aged 6–14 years since they are school going children and get a chance to mix with other children in school which is very important as far as a contagious disease like scabies is concerned. A total of 200 children in this age group were included in the present study. A total line list of children aged 6–14 years was taken from local Panchayat. In the line list, all children were given a code number starting with 1. These children were selected from the line list by a systematic random sampling technique. The study was conducted for two months in the year 2014 from November to December. Institutional Ethics Committee clearance was taken before conduction of the study.

The children underwent a medical checkup done by a registered medical practitioner who is also the principal investigator of this study. Any medical condition detected was treated with appropriate prescription by the principal investigator. After thorough medical checkup, the mothers of the children were asked some questions using a predesigned, pretested schedule. Then, they were given containers for collection of stool specimens. Stool specimens were collected the next day and examined in the laboratory for ovum, parasite, and cysts. Data were collected regarding the presence of scabies as well as other diseases like diarrhea, amoebiasis, giardiasis, boil, eczema, ringworm infection, upper, and lower respiratory tract infections.

After data collection and checking the clean data, a sheet was generated in SPSS version 16.0 and analysis was done on this software.

RESULTS

The present study included 200 children in the age group of 6–14 years with a mean age of 9.5 years and standard deviation of 2.1 years. Briefly, 52% of the children were male and 48% were female. Majority (62%) of the children were Muslim and 38% were Hindu, as shown in Table 1. Socio-economic status was assessed according to modified Prasad's scale and it was seen that majority of the study group was either from lower middle (28%) or upper lower (39%) or lower (22.5%) group. Only 3% belonged to the upper socio-economic status and 7.5% belonged to the upper middle socio-economic status. The level of literacy of the mothers of the children was also taken into consideration and it was found that 41% mothers were illiterate and the remaining 59% were literate. Mothers were asked about the number of children they had. It is revealed that 5.5% of the study group children did not have any sibling, 29.5% had one sibling, 30.5% had two siblings and 34.5% had more than two siblings.

Table 1: Socio-demographic characteristics of the study group

Parameters	Number	Percentage
<i>Sex</i>		
Male	104	52.0
Female	96	48.0
<i>Religion</i>		
Hindu	76	38.0
Muslim	124	62.0
<i>Socio-economic status</i>		
Upper	6	3.0
Upper-middle	15	7.5
Lower-middle	56	28.0
Upper-lower	78	39.0
Lower	45	22.5
<i>Mother's literacy</i>		
Illiterate	82	41.0
Literate	118	59.0
<i>Presence of siblings</i>		
No	11	5.5
One	59	29.5
Two	61	30.5
More than two	69	34.5

Table 2 highlights the prevalence of scabies and other diseases which are related to unhygienic conditions or water-borne infections. It is revealed that 42% of the children in the study group had scabies at the time of study. The history of 24.5% of the children showed that they had suffered from diarrhea within last 15 days. In total, 75.5% children had amoebiasis during the study and 13% had giardiasis. Skin conditions other than scabies were also checked for. Boils were present in 44% children. 38% children were suffering from ringworm infection at the time of study and 13% children were suffering from eczema. In total 20.5% children had suffered from respiratory tract infections within the last 15 days before study.

The present study did not find any significant change in prevalence of scabies with change in age. However, scabies was significantly more prevalent among children belonging to families with less per capita monthly income ($p=0.003$) as shown in Table 3. With the increase in the per capita income, scabies prevalence decreased significantly. There is a significant increase in prevalence of scabies with the increase in the number of siblings ($p=0.007$).

Association of prevalence of scabies with different socio-demographic parameters is shown in Table 4. The prevalence of scabies was not significantly different between boys and girls ($p=0.227$) and between different religions ($p=0.673$). However, the prevalence was significantly high among children of illiterate mothers as compared to literate mothers ($p<0.001$).

Table 2: Prevalence of different diseases

Diseases	Number	Percentage
<i>Scabies</i>		
Yes	84	42.0
No	116	58.0
<i>Diarrhea in last 15 days</i>		
Yes	49	24.5
No	151	75.5
<i>Amoebiasis</i>		
Yes	121	60.5
No	79	39.5
<i>Giardiasis</i>		
Yes	26	13.0
No	174	87.0
<i>Boil</i>		
Yes	88	44.0
No	112	56.0
<i>Ring worm infection</i>		
Yes	76	38.0
No	124	62.0
<i>Eczema</i>		
Yes	26	13.0
No	174	87.0
<i>Respiratory tract infection in last 15 days</i>		
Yes	41	20.5
No	159	79.5

Scabies was significantly associated with the presence of other diseases. Children having a history of diarrhea episodes within last 15 days had significantly more prevalence of scabies as compared to others ($p<0.001$). The presence of amoebiasis and giardiasis were assessed by stool examination. Scabies was found to be significantly associated with amoebiasis ($p<0.001$) and giardiasis ($p=0.005$). Children were examined for the presence of any ringworm infection. It was observed that children having ringworm infection

had significantly high prevalence of scabies as compared to other group ($p<0.001$). However, the association between eczema and scabies was not found to be clinically significant ($p=0.053$). Medical checkups were done as well as histories were studied for the presence of respiratory tract infections (lower or upper) on the day of the study or within last 15 days. It was seen that prevalence of scabies was significantly high among children who suffered from respiratory tract infections at that time or within last 15 days.

DISCUSSION

Scabies, a contagious disease, along with the associated itching is not only a medical but also a social problem. Sometimes children with scabies are neglected by their friends and are not allowed to participate in playing groups. This creates a feeling of loneliness and depression among children. Often, the treatment is not done in a proper way and family members are not treated which results in recurrence of the problem.

The present study found very high prevalence (42%) of scabies among children aged 6–14 years. This finding is less than that revealed by Nair et al. in 1977.¹ One study was conducted by Steer et al. in 2009 among 5–14 years old children in Fiji which found scabies prevalence of 18.5%.¹² Yap et al. conducted a study in a secondary boarding school in Malaysia among adolescents aged 13–17 years in 2009 and found that 8.1% children had scabies.¹³ In Nigeria in 2005, Ogurbiyi et al. found the prevalence of scabies among rural children aged 4–15 years to be 4.7%.¹⁴ Sharma et al. conducted a study in India in 1984 in a rural community and they found scabies was present among 13% of the general population.¹⁵ Another Indian study by Gulati et al. in semi-urban community of Goa has found that 9.7% of the population was infected with scabies.¹⁶ However, in recent times there has been a paucity of study on scabies in India, though the prevalence is still high. The present study found that scabies is significantly more prevalent in people with a low economic status. Low income groups usually live in unhygienic conditions which help spreading the disease. Many studies have highlighted the role of overcrowding in the causation of scabies.^{17–20} The present study has revealed that with the increase in the number of siblings there is a significant increase in the prevalence of scabies. As the number of sibling increases there is increase of overcrowding and so our study results corroborate the findings of other studies.

Social disconnection among girls often creates much mental depression among them as compared to boys. The

Table 3: Relation of scabies with different socio-demographic characteristics

Parameters	p-Value	Mean difference	95% Confidence interval	
			Lower	Upper
<i>Scabies</i>				
Age	0.218	2.375	-1.05	5.80
Per capita monthly income	0.003	1200.5	368.26	2032.74
Number of siblings	0.007	-1.93	-3.14	-0.72

Table 4: Association of scabies prevalence with socio-demographic characteristics and other diseases

Parameters	Scabies		Total
	Yes	No	
Sex			
Male	50 (48.1%)	54 (51.9%)	104 (100%)
Female	38 (39.6%)	58 (60.4%)	96 (100%)
Chi square=1.46, $p=0.227$, O.R.=1.41, 95%C.I. of OR=0.78–2.58			
Religion			
Hindu	32 (42.1%)	44 (57.9%)	76 (100%)
Muslim	56 (45.2%)	68 (54.8%)	124 (100%)
Chi square=0.18, $p=0.673$, O.R.=0.88, 95%C.I. of OR=0.48–1.64			
Mother's literacy			
Illiterate	54 (65.8%)	28 (34.2%)	82 (100%)
Literate	34 (28.8%)	84 (71.2%)	118 (100%)
Chi square=26.94, $p\leq0.001$, O.R.=4.76, 95%C.I. of OR=2.49–9.16			
Diarrhea in last 15 days			
Yes	32 (65.3%)	17 (34.7%)	49 (100%)
No	56 (37.1%)	95 (62.9%)	151 (100%)
Chi square=11.96, $p\leq0.001$, O.R.=3.19, 95%C.I. of OR=1.55–6.64			
Amoebiasis			
Yes	74 (61.2%)	47 (38.8%)	121 (100%)
No	14 (17.7%)	65 (82.3%)	79 (100%)
Chi square=36.60, $p\leq0.001$, O.R.=7.31, 95%C.I. of OR=3.52–15.39			
Giardiasis			
Yes	18 (69.2%)	8 (30.8%)	26 (100%)
No	70 (40.2%)	104 (59.8%)	174 (100%)
Chi square=7.72, $p=0.005$, O.R.=3.34, 95%C.I. of OR=1.28–8.92			
Boil			
Yes	57 (64.8%)	31 (35.2%)	88 (100%)
No	29 (25.9%)	83 (74.1%)	112 (100%)
Chi square=30.39, $p<0.001$, O.R.=5.26, 95%C.I. of OR=2.74–10.15			
Ring worm infection			
Yes	48 (63.2%)	28 (36.8%)	76 (100%)
No	40 (32.3%)	84 (67.7%)	124 (100%)
Chi square=18.26, $p<0.001$, O.R.=3.60, 95%C.I. of OR=1.90–6.87			
Eczema			
Yes	16 (61.5%)	10 (38.5%)	26 (100%)
No	72 (41.4%)	102 (58.6%)	174 (100%)
Chi square=3.73, $p=0.053$, O.R.=2.27, 95%C.I. of OR=0.91–5.74			
Respiratory tract infection in last 15 days			
Yes	27 (65.9%)	14 (34.1%)	41 (100%)
No	61 (38.4%)	98 (61.6%)	159 (100%)
Chi square=10.00, $p=0.002$, O.R.=3.10, 95%C.I. of OR=1.43–6.79			

present study has found no significant difference of scabies between boys and girls. Burkhart also has found that the prevalence of scabies is not significantly different between males and females.²¹ Mothers' literacy has a significant role in the prevalence of scabies among their children as found in the present study. Fathy et al. in a study from Libya have found that higher education significantly decreases the prevalence of scabies.²² Scabies is significantly associated with diarrhea, amoebiasis, giardiasis, boil, ringworm infestation and respiratory tract infections. All these diseases are related to poor hygienic conditions. These are closely associated with scabies.

Proper health education regarding hygienic practice can prevent scabies to some extent as evidenced by other studies like study by Talukder et al.²³ Early diagnosis and prompt treatment can only be possible after awareness generation among people. Health workers and school teachers should be trained to deliver health education to the general population and school children. In their review, Hay et al. highlighted the importance of further actions in achieving control targets.²⁴ Regular research and planned intervention can reduce the burden of scabies from the population.

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