Original Article

Risk Factors Associated with Head Lice Infestation in Rural Pediatric Patients

Neerja Saraswat, Pooja Shankar[1], Ajay Chopra, Barnali Mitra[2], Sushil Kumar[3]

Departments of Dermatology and [2]Pediatrics, Base Hospital Delhi Cantt, New Delhi, [1]Department of Community Medicine, ADH Jabalpur Cantt, Madhya Pradesh, [3]Department of Dermatology, MLN Medical College, Base Hospital Delhi Cantt, India

Abstract

Introduction: Head louse infestation is a common parasitic disease in pediatric age group. It is common in collective centers such as schools, garrisons, campuses and old age homes. It is worldwide in distribution with no strict limitation with respect to age, gender and race. **Aims:** Present study was conducted to investigate the socio-economic and lifestyle risk factors for head louse infestation in pediatric patients. **Materials and Methods:** An observational descriptive study at a tertiary care hospital in rural Uttar Pradesh over a period of 1 year wherein measurement of disease/risk factors associated with head louse infestation was performed. It was carried out in all children between 5 and 15 years of age using a pre-validated questionnaire. The method of convenience sampling was used and multiple logistic regression was run to account for potential confounding variables using SPSS software. **Results:** A total of 165 (71.1%) females and 67 (28.8%) males were infested. Most common age group affected was between 5 and 7 years where 97 (41.8%) children were infected. Ninety-five (40.9%) children were in fourth to seventh standards. Parents of 137 (59%) children were not formally educated. Eighty-one (34.9%) children had six members in the family while per capita income was between 5000 and 2500 in families of 139 (59.9%) children. Eighty-seven (37.5%) children had hair length up to shoulders. One twenty-eight (55.1%) children had no family member affected. Seventy-six (32.7%) children took bath twice a week only. **Conclusion:** Social and economic factors as well as lifestyle and education level of patients play a significant role in epidemiology of head lice.

Keywords: *Head lice infestation, hygiene, lifestyle*

Introduction

Pediculus humanus capitis is an obligate ectoparasite infesting the scalp of humans. The resulting infestation "Pediculosis" is endemic world-over and no gender, age or race is immune to it.[1,2] It commonly presents with scalp itching and irritation but can have occasional secondary infection due to scratching.[3] Head lice infestation is commonly encountered in the age group of 6-12 years and females have 2-4 times high chances of infestation.[4] Although not a major health problem, it is associated with social embarrassment, isolation, anxiety in parents, criticism in peer group and absenteeism from academic activities.[5] A growing body of evidence is suggestive of the fact that host factors such as income of the family, hygiene, number of members in family, are closely associated with head lice infestation.[6,7]

Present study was done to assess the risk factors associated with head louse infestation in children to bridge the existing gap in our knowledge regarding the same. Unfortunately, not much literature is available on this topic in our country.

Materials and Methods

This was an observational descriptive study done over a period of 1 year between May 2017 and April 2018 in a tertiary care hospital in eastern Uttar Pradesh. Permission of institutional ethics committee was obtained after conception of the study. Convenience sampling was adopted, thus including all children between 5 and 15 years of age affected with head louse and visiting the skin OPD during our study period. All consecutive children aged between 5 and 15 years reporting for skin consultation for head lice during this period were included in the study after explaining the nature of study and obtaining consent from their parents/attendants in the presence of children. The cases where consent could not be obtained or the children had other

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Address for correspondence:
Dr. Ajay Chopra, Department of Dermatology, Base Hospital, Delhi Cantt - 110 010, India. E-mail: neerjaneerja007007@gmail.com

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co-morbidities like neurodegenerative or psychiatric illness were excluded from the study. For operational purpose, a child was considered infested if live lice and/or nits were seen on visual examination. Careful visual examination of scalp and hairs was carried out in adequate day light by the healthcare provider for the presence of adult lice, nymphs or viable nits. Attempt to look for body lice also was made but the data was not included in the study. Measurement of the disease and/or risk factors was carried out using the pre-validated questionnaire. Parents of children were served this questionnaire with the help of nursing staff regarding the details of personal data, socioeconomic profile of the family members, lifestyle and habits. Family members who accompanied the child with infestation were also examined for the presence of lice/eggs or nymphs. History of similar complaints in contacts and family members who were not physically present was enquired and endorsed in the questionnaire. Multiple logistic regression was run to account for potential confounding variables using SPSS software. Since the study was a descriptive observational study, with this design, exposure and outcome are measured simultaneously; hence, outcomes, exposures, predictors, confounders and effect modifiers were taken care of. The data was endorsed in pro forma in coded format and later analyzed in terms of frequency and percentages at the end of 1 year.

Results

A total of 232 children in the age group of 5-15 years were included in the study. Head lice infestation was seen in 165 (71.1%) females as compared to 67 (28.8%) males. Male to Female ratio was 2.4. The data regarding age, gender, education of child and parents, total number of members in the family and per capita income of the family are detailed in Table 1. Lifestyle-related factors such as frequency of bathing, combing, length of hair and history of other family members affected are depicted in Table 2. Table 3 shows the availability of hygiene materials such as soaps/shampoos, availability of adequate water, sharing of bed with other family members and the number of family members sharing the room with the infested child.

Table 1: Demographic and socio-economic data

	Number	Percentage
Age (years)		
5-7	97	41.8
7-10	58	2
10-12	31	13.3
12-15	46	19.8
Gender		
Male	67	28.8
Female	165	71.1
Education (class)		
Not enrolled	19	8.1
1st-3rd	81	34.9
4th-7th	95	40.9
7th-11th	35	15
≥12th	2	0.08
Parental education		
Not formally educated	137	59
Both parents educated	11	4.7
Only father	68	29.3
Only mother	16	6.8
Total members in family		
3 persons	17	7.3
4 persons	31	13.3
5 persons	49	21.1
6 persons	81	34.9
>6 persons	54	23.2
Per capita income (Rupees)		
10,000	18	7.7
10,000-5000	30	12.9
5000-2500	139	59.9
2500-500	21	9.0
<500	24	10.3

Discussion

Pediculosis capitis or head louse infestation is a well-known entity since antiquity. Although not considered a primary health hazard, it is a common societal problem encountered in tropical and subtropical nations world-over, especially in rural areas. Apart from school children, refugees, urban slums, child labor, jails, orphanages and fishing communities are also vulnerable to get infested.

Socio-economic determinants seem to be an indicator of magnitude of lice infestation, other dynamic determinants like hygienic status and overcrowding have a more specific role to play. The overall prevalence of head louse infestation is varied across the globe and among different communities in the same country. Prevalence of head louse infestation is estimated to range between 0.7%-59% in Asian population, 0.48%-22.4% in European, 3.3%-58.9% in African and 3.6%-61.4% in American countries.[8] However, no data on prevalence of head louse infestation is currently available from India.

We chose the age group of 5-15 years for our study as it is the most common age group affected with head lice infestation. Overall, girls are more likely to have infestation of scalp hair with lice as mentioned in many earlier studies. In present study also, we noticed a female preponderance.[9] The reason for this difference in gender distribution may be attributed to the fact that boys tend to have short length of hair while girls prefer long hair and that boys are more likely to be taken care of by the parents as compared to girls especially in rural settings in our country.

Factors such as whether the child is staying with both or single parents, education and occupation of the parents,

Table 2: Lifestyle-related factors

	Number	Percentage
Family members affected		
Yes	104	44.8
No	128	55.1
Frequency of bathing		
Twice a day	31	13.3
Everyday	26	11.2
Alternate day	59	25.4
Twice a week	76	32.7
One a week	40	17.2
Frequency of combing per day		
Once a day	138	59.4
Twice a day	54	23.2
Three times a day	27	11.6
More than three times	13	5.6
Length of hair		
Up to 2 inches	42	18.1
Nape of neck	38	16.3
Shoulders	87	37.5
Below shoulder level	65	28

Table 3: Associated risk factors

	Number	Percentage
Number of people sharing the room		
<2	12	5.1
2-4	107	46.1
4-6	96	41.3
>6	17	7.3
Availability of water		
Public source	89	38.3
Personal	143	61.6
Availability of soaps/shampoos		
Yes	129	55.6
No	103	44.3
Sharing of bed		
Yes	197	84.9
No	35	15
Sharing of towels/soaps		
Yes	212	91.3
No	20	8.6
Sharing of combs		
Yes	187	80.6
No	45	19.3

number of children in the family, total number of members in family, per capita income, sharing of beds, rooms and headgears have been associated with head lice infestation in earlier studies.[10,11] Low frequency of hair washing, poor personal hygiene, availability of washing area, soaps and shampoos also have a positive correlation with prevalence of head louse infestation.[12] Education of the parents have conflicting association with prevalence of head louse infestation in children. Parental education is likely to reduce the chances of child having infestation as hygiene is taken care of and chances of getting medical intervention increases in these families. Present study found an inverse relationship between education of the parents and infestation with head lice. This is contrary to the findings of Sim *et al*. where no significant co-relation was found between parental education and infestation of head lice in children.[13] However, other studies have found that parental education reduced the chances of louse infestation.[14] Income of the family is another important risk factor as seen in this study. Children whose mother and father are earning are less likely to get infected as compared to single parent earning and low per capita income.[15] We also found a positive correlation with number of people sharing the room with the number of children with head louse infestation which is consistent with earlier studies. It is proposed that increase in the size of the family results in increase in transmission of the lice and likelihood of infestation which is consistent with our study. The reason can be that as the number of members in a family increases that chances of been ignored is high in children as the parental attention tends to get divided.[16,17] Low frequency of hair washing and unavailability of soaps and shampoo had positive correlation with head lice infestation in this study which is in alignment with studies done in the past.[18] Exchange of head gears and close personal contact are the chief mode of transmission of head lice like in our study where we noticed that exchanging the soaps, towels and headgear was observed in children who had head louse infestation.

Willems *et al*. in their study on 6,169 school children in Belgium found that infestation rate was higher in children from low socio-economic strata, more children in family, long hair and brown hair. The study concluded that long and brown hair are independent risk factors for head lice infestation in children.[19]

Though head lice infestation continues to be a health burden in low socio-economic societies including India, the studies on the associated risk factors are lacking at present. This is the first study to assess the risk factors associated with pediculosis capitis in pediatric patients from India to the best of our knowledge.

Conclusion

Although head louse infestation is a common condition seen in pediatric patients, especially in rural parts of our country, the risk factors associated with it remains disputed. It has a negative impact on child and families of infected children, like constant stigmatization, low self-esteem and loss of academic hours. Apart from these effects, children may encounter anxiety due to infestation of head by lice. Though the medical management is effective,

the challenging part remains to be patient or parental counselling and inculcating healthy lifestyle changes and observing proper hygiene measures. Present study is an attempt to highlight the importance of lifestyle measures and social factors which can be modified by guiding the patients and their families as preventive strategies against head louse infestation. Avoiding sharing of pillows, beds and combs with the infested case can be a simple method to prevent it.

Limitations of the study

Present study has few limitations as only pediatric age group reporting to OPD was included in the study. Thus, the results may not actually represent the general population. Also, the risk factors among children coming from rural background might be different from those in urban areas. Hence, the current study may be considered as a pilot study based on which comparative studies can be conducted regarding risk factors for head louse infestation between children of rural and urban background.

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Conflicts of interest

There are no conflicts of interest.

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