

# Louse infestation in human populations in Shillong, India

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**Summary:** An epidemiological survey of head lice (*Pediculus humanus capitis*), body lice (*P. h. humanus*) and pubic lice (*Phthirus pubis*) infestations among different sexes and ages of two socio-economically distinct groups of population sharing the same climate in Shillong (India) was conducted during August–October 1989. In a total of 536 poor and 437 middle-class individuals examined, the overall prevalence of lice was found to be 59.7% and 15.79%, respectively. The body louse emerged as the dominant louse species followed by head louse. Pubic lice were the least prevalent species among the two groups of people examined. Both body lice and pubic lice showed a higher prevalence among the male individuals, whereas head lice occurred more frequently among females. Poor hygiene and over-crowded living conditions favour transmission and perpetuation of these ectoparasites in the study area.

## Introduction

Ectoparasitic infections among human populations are of a world-wide importance<sup>1,2</sup> particularly in under-developed and developing countries in the tropics. Louse infestation, especially among socio-economically poor sections of society, is a major problem in India.<sup>6–8</sup>

Although numerous surveys have been conducted by several investigators in different parts of the globe<sup>9–13</sup> and also in India,<sup>14–16</sup> to the best of our knowledge there is at present no report available on the occurrence and prevalence of human pediculosis in the hilly region of North-East India.

In the present communication we sought to determine the prevalence of lice among poor and middle-class groups of human populations sharing the same climate in Shillong, a high-rainfall, super humid region in India.

## Materials and methods

### Study area and community studied

Shillong (91°45'30"E-25°30'45"N) is a hilly city in North-East India situated at about 1500–1540 m above sea level (mASL) and experiences a subtropical, monsoonic climate. Temperature usually does not rise more than 26°C;<sup>17</sup> relative humidity is very high (mean daily relative humidity during the study period was about 85%) and rains are distributed throughout the year with a very short dry season (November to January).

During August–October 1989 a survey was conducted on human subjects representing two socio-economically distinct groups:

- Group I Living in a suburban area with several swamps; uneducated poor people, farmers or labourers by occupation; average number of members in a family is nine.
- Group II Living in urban area with no swamps, educated middle-class people, businessmen or office workers; average number of members in a family is six.

### Examination

Information was gathered regarding the occurrence of *Pediculus humanus humanus* and *Phthirus pubis* infestation by enquiring from each head of the family in both the groups and simultaneously obtaining the specimens from infested subjects; visual inspection was, however, mostly restricted to male individuals only. Actual recovery of *P. h. humanus* was also made by examination of garments of all the people under study. For recovery of *P. h. capitis*, hair of each member was thoroughly combed with a plastic lice-comb (having densely packed teeth) for a period of about 1–3 minutes depending upon the density of lice. A total of 536 and 437 individuals, belonging to 59 group I, and 72 group II families respectively, were surveyed.

## Results

The overall prevalence of lice was found to be 59.7% and 15.79% among groups I and II, respectively. The rate of infestation was significantly higher in the former group, particularly in the age group 11–20 years (Table 1). *P. h. humanus* emerged as the predominant species,

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Table 1. Overall rate of louse infestation among human populations of Shillong

Age (in years)	Male						Female						Total subjects		
	Group I		Group II		Group I		Group II		Group I		Group II		Group I	Group II	
	N.E.	N.I.	%	N.E.	N.I.	%	N.E.	N.I.	%	N.E.	N.I.	%	N.E.	N.I.	%
5-10	38	10	26.3	38	2	5.2	54	22	40.7	60	4	6.67	92	32	34.7
11-20	119	56	47.1	59	11	18.6	128	125	97.6	27	7	25.9	247	181	73.2
Above 20	122	52	42.6	148	29	19.5	75	55	73.3	105	15	14.2	197	107	54.3
Total	279	118	42.3	245	42	17.1	257	202	78.6	192	26	13.5	536	320	59.7

N.E. = number examined; N.I. = number infested; % = percentage of infestation.

followed by *P. h. capitis*. *Phthirus pubis* was the least prevalent (Table 2). *P. h. humanus* was more prevalent in the age group 11–20 years. While *P. h. capitis* showed its higher prevalence in the age group above 20 years in group I, in the other section the age group 11–20 years was more frequently parasitised (Table 2). Both *P. h. humanus* and *P. pubis* showed a higher prevalence among the male individuals whereas *P. h. capitis* occurred more frequently among females. In group I, four females (age group 5–10 years) had eggs of *P. pubis* on their eye lashes as well and in heavy infestation they were also recovered from the inner surface of the ankle joint. In cases of heavy infestations, body lice were also recovered from the bed linen and all the members of the family were infested.

### Discussion

The present investigation indicates that all the three types of lice are prevalent in the hilly city and are more common among the poor people in the suburban area. Of the three types of lice recorded, body louse, which acts as a vector for epidemic typhus, relapsing fever or trans fever<sup>18</sup> was the predominant one being highest in the age group 11–20 years in both the populations. A similar rate of infestation was also observed among the age group above 20 years. When compared with the observation of Hati *et al.*<sup>6</sup> in high altitude localities in North India (*viz.* Joshimath, 1860 mASL; temp 16°C, Badrinath, 3812 mASL; temp 10°C) it is revealed that body louse is more common in Shillong. In accordance with the results of Hati *et al.*<sup>6</sup> our study also indicates that males were more frequently infected than females with body louse. Although there are at present no reports of louse-borne typhus in Shillong, trans and relapsing fever are known to occur in the study area.

A sharp difference in the prevalence of pubic lice was also observed between the two groups (11.75 and 3.66%). Though male individuals of the poor section were more infested than females, in the other group infestation was restricted to males only. Hati *et al.*<sup>15</sup> also reported that 96.96% of the pubic louse infested subjects were male. Possibly as a result of the reluctance of females to admit to their infection, in group II the prevalence of crab lice was reportedly nil among them.

A comparative study by Hati *et al.*<sup>7</sup> of the prevalence of head louse infestation in different parts of the globe revealed an increasing trend of prevalence in most of the industrialised countries

like USA, Canada, England, Germany, etc. Though it is difficult to compare the data from various countries as studies have been performed using different parameters of time and populations (urban, rural, students, out-patients, in-patient etc.), it seems that head louse is very common in Kenya,<sup>4</sup> Nigeria,<sup>5</sup> India,<sup>6-8,14-16</sup> Ghana<sup>12</sup> and Iran<sup>19</sup> as compared with England,<sup>9</sup> Canada,<sup>10</sup> USA,<sup>20</sup> Germany<sup>21</sup> and Czechoslovakia.<sup>22</sup> These differences are largely due to reasons such as culture, custom, personal hygiene and habits; insecticidal resistance may also play a vital role for the increasing trend of louse infestation in different countries.

Investigations carried out in different climatic zones in India like Joshimath, Badrinath,<sup>6</sup> and Mohanpur<sup>7</sup> revealed that 37.08%, 70.27% and 44.34% of the people were infested with head lice respectively. Further, it is also indicated that pediculosis is more common in hilly areas than the plains and the rate of infestation increased with the increasing altitude.<sup>6</sup> A possible reason for this high prevalence in the hilly regions may be the milder ambient temperatures in the hilly regions. Besides, the factors contributing to the higher rate of pediculosis among the poor section of population in the suburban area may include:

- (i) poor hygienic and socio-economic living conditions,
- (ii) big family size and over-crowding at home,
- (iii) apathetic attitude towards the infestation and ignorance about its harmful effects,
- (iv) very infrequent changing or cleaning of clothes and not taking baths regularly because of cold and also scarcity of water, and
- (v) use of the same comb by all members of the family.

### Conclusion

It can be concluded from this study that there is a high prevalence of pediculosis among the poor community studied in the suburban area. The possibility of a health hazard due to louse infestation cannot be ruled out in the community and a mass health education programme seems necessary particularly in the suburban areas. Its aims should include making people aware of the risks and the ways in which infestation is spread and encouraging them to assume responsibility for self protection. As schooling age is the best time for changing and moulding habits, teaching

Table 2. Species-wise prevalence of louse infestation among two populations of human subjects in Shillong

Louse species	Age groups (years)	Male				Female				Total subjects			
		Group I		Group II		Group I		Group II		Group I	Group II		
		N.I.	%	N.I.	%	N.I.	%	N.I.	%	N.I.	%		
<i>Pediculus humanus humanus</i>	5-10	5	13.16	Nil	0.00	9	16.66	1	2.63	14	15.22	1	1.02
	11-20	58	48.74	7	11.86	29	22.66	Nil	0.00	87	35.22	7	8.14
	Above 20	51	41.80	18	12.16	12	16.00	2	1.35	63	31.98	20	7.91
	Total	114	40.86	25	10.20	50	19.45	3	1.56	164	30.59	28	6.41
<i>P. h. capitis</i>	5-10	5	13.16	2	5.26	16	29.63	3	5.00	21	22.83	5	5.10
	11-20	3	2.52	Nil	0.00	72	56.25	7	25.92	75	30.36	7	8.13
	Above 20	Nil	0.00	Nil	0.00	66	88.00	14	13.33	66	33.50	14	5.53
	Total	8	2.86	2	0.82	154	59.92	24	12.50	162	30.22	26	5.94
<i>Phthirus pubis</i>	5-10	Nil	0.00	Nil	0.00	Nil	0.00	Nil	0.00	Nil	0.00	Nil	0.00
	11-20	29	24.37	4	6.77	3	5.56	Nil	0.00	32	12.95	4	4.65
	Above 20	26	21.31	11	7.43	5	6.67	Nil	0.00	31	15.74	12	4.74
	Total	55	19.71	15	6.12	8	3.11	Nil	0.00	63	11.75	16	3.66

N.I. = number infested; % = percentage of infestation.

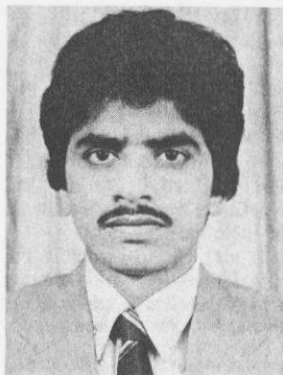
about the proper life-style should be given in school.

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