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PREVALENCE OF NITS AND LICE IN SAMPLES OF CUT HAIR FROM FLOORS OF BARBERSHOPS AND BEAUTY PARLORS IN BELO HORIZONTE, MINAS GERAIS STATE, BRAZIL

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A louse survey based on samples of cut hair collected from floors of barbershops and beauty parlors was conducted in Belo Horizonte, Minas Gerais State, Brazil, from October 1984 to April 1985, as an alternative way to determine the prevalence of pediculosis capitis in the population. Of 475 samples examined for nits, nymphs, or adults of Pediculus capitis, *140 were infested (29.5%). A total of 58 lice and 3,553 nits were found in 33,632.9 g of hair collected, giving a ratio of 0.10 nit/g. Almost 29% of the nits were viable and capable of being transmitted after hatching. There was significant difference among the infestation rates by socioeconomic levels, and samples from barbershops with male customers were the most infested. Based upon the number of haircuts in each sample, we estimated that 5 or 6% of the population might be infested by this species.*

Key words: lice – *Pediculus capitis* – human head louse – pediculosis capitis – nits

A substantial worldwide increase of the human head louse, *Pediculus capitis* De Geer (= *Pediculus humanus capitis*) has occurred during the last fifteen years. This has been demonstrated by visual inspection in studies on the prevalence and distribution of head louse infestation among schoolchildren: Slonka et al. (1976; 1977) in USA; Donaldson (1976) and Robinson (1985) in England; Grainger (1980) in Seychelles; Petrelli et al. (1980) in Italy; Ewasechko (1981) in Canada; Kwaku-Kpiki (1982) in Accra; Hoffmann (1983) in Federal Germany; Sinniah et al. (1983) in Malaysia; Ogunrinade & Oyejide (1984) and Arene & Ukaulor (1985) in Nigeria; Chunge (1986) in Kenya. The resurgence of lice has been attributed to overcrowded living conditions, and to development of resistance to insecticides used for treatment.

Head louse infestation in Brazil has not been surveyed previously, although individual reports from teachers, parents and others have revealed a high prevalence in almost all cities and villages. The increase of head louse infestation has been manifested by increased sales of antilouse insecticides and fine-tooth combs in drugstores, as well as by reports of poisoning by self-treatment with pesticides.

This study was conducted, as an alternative way, to determine a quick prevalence and distribution of *P. capitis* in the population. It was based on samples of cut hair collected from floors of barbershops and beauty parlors.

MATERIALS AND METHODS

Hair samples were collected from clippings on the floor of barbershops and beauty parlors distributed over several sectors and districts in the city of Belo Horizonte from October 1984 to April 1985. Each sample, containing a mean weight of 70 g of hair from 5 or 6 individuals was sent to the laboratory where it was examined for lice or nits by direct inspection, or with a hand lens.

The study was possible because of the essential characteristic of this species – to lay and cement eggs on the hairs of the head near the scalp – that permits the easy finding of nits in clippings. Nymphs and adults, although less likely than nits, could be also found, dead or alive, because: a) they have legs with strong terminal claws and adaptations that permit their attachment to the host and; b) the species completes all stages of its life cycle on the host.

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Lice were counted, sexed, and transferred into 70% alcohol in small vials. Nits were examined for viability; both lice and nits were further related to the type of barbershops classified by clientele, and to haircut price as a socioeconomic factor.

The chi-square analysis was used to determine the degree of association between infestation and factors considered.

RESULTS

Prevalence – Samples of cut hair were examined from 475 barbershops and beauty parlors, of which 140 were infested with lice or nits, revealing a mean prevalence or percent infestation of 29.5%. The prevalence ranged from 6.4 to 54.3%, depending on the district. Of the samples infested, 2 were infested with adults and nymphs only (1.4%), 131 with nits only (93.6%) and 7 with adults, nymphs, and nits (5%).

Intensity of infestation – The total number of adult and nymphal lice found in the samples was 58, of which 17 were males, 16 females, and 25 nymphs. A total of 3,553 nits was counted in 33,632.9 g of hair collected, a nit/g hair ratio of 0.10. The number of nits per hair, number of hair infested in the samples, and total number of nits per sample are presented in Table I.

Viability of nits – Of the nits observed, 28.9% were viable and 71.1% were empty. The criteria assumed for viability were the presence of operculum and existence of some content inside.

Type of barbershop or beauty parlor – Based on the customers and the origin of the samples, the barbershops and beauty parlors were categorized as for men and boys, for women and girls, for children (under seven years old), or mixed (for men and women); these categories were further related to infestation with nits or lice. The greater prevalence was observed in samples from barbershops with male customers. Of the 475 samples collected, 95 were mixed (20%) and 23 of them were infested (24.2%). The origin of other 8 was not informed (Table II).

TABLE I

Prevalence of nits of *Pediculus capitis* in samples and hairs found in Belo Horizonte, Minas Gerais State

No. nits per sample	No. samples infested	No. nits per hair	No. hairs infested	No. nits found
Only 1	25	1	25	25
More than 1	92	1	3384	3384
	15	2	58	116
	6	3	6	18
	1	4	1	4
	1	6	1	6
Total	140		3474	3553

TABLE II

Relationship between the infestation by *Pediculus capitis* and the type of customers of barbershops and beauty parlors in Belo Horizonte, Minas Gerais State

Type of barbershop	No. samples collected	No. samples infested	% samples infested*
For men	238	85	35.7**
For women	127	30	23.6
For children	7	2	28.5
For men/women	95	23	24.2
No information	8	–	12.5
Total	475	140	29.5

* % combined: for men = 32.4; for women = 23.9.
** Chi-square test: $P > 0.05$.

TABLE III

Relationship between infestation of the samples collected and haircut prices in the barbershops and beauty parlors in Belo Horizonte, Minas Gerais State

Haircut prices (U.S.$*)	Socioeconomic status	No. of barbershops examined	No. of barbershops infested	% of barbershops infested
0.26-0.66	low	175	65	37.1**
0.70-1.00	middle	124	42	33.8
1.03-1.33	middle	78	18	23.1
1.36-1.66	high	56	10	17.8
>1.66	high	42	5	11.9

* U.S.$ 1.00 = 3,000 cruzeiros or 3 cruzados.
** $P < 0.001$

Haircut price – The haircut price in each barbershop was considered a measure of socioeconomic status and was inversely related to the infestation of the samples (Table III). The values in cruzeiros were converted to US dollars, at the mean exchange rate of 3,000 cruzeiros/dollar. The 475 barbershops and beauty parlors were divided into three socioeconomic levels, according to the haircut prices: low (US$ 0.26/US$ 0.66); middle (US$ 0.70/US$ 1.33); high (over US$ 1.36).

DISCUSSION

Of the positive samples collected from floors of barbershops and beauty parlors 93.6% were infested by nits. Nymphs and adults were observed in 6.4% or them. In crops of hair, taken from occupants of hospitals and jails in different parts of world (Buxton, 1938), the percent infestation for adult or nymphs ranged from 7.1 to 52.1%. In that study nits were not observed because the hair samples were previously dissolved in sodium sulphide and alkali. In Belo Horizonte city higher rates of infestation were found in districts with lower socioeconomic levels. We do not know whether the ratio of 0.10 nits per gram of hair is high or low, since, up to now, no quantitative surveys of nits of *P. capitis* have been conducted. Studies similar to ours might provide rough estimates of infestation and might subsidize or substitute some surveys conducted by direct inspection of people's hair, because nits are quickly seen in the samples.

Many of the samples infested showed only 1 nit per hair in the sample examined, but in one case up to 6 nits were counted on a single hair (Table I).

About 29% of the eggs examined were viable and hence theoretically capable of transmission after hatching. Lice were seen alive when the samples were examined in the same day after collecting. These data are important for cleaning of combs, brushes and towels in the barbershops.

The highest prevalence was observed in barbershops with male customers. This could be explained by the low number of barbershops exclusively for children, that is with clientele under six or seven. As a general rule, children over seven and boys cut their hair in barbershops for men. Therefore, the infestation in barbershops for men was higher than that in barbershops for children, or for women.

Nits and lice were found in samples from barbershops with more diverse haircut prices. It was also noted that the lower the haircut prices in the barbershops, the higher the infestation rates observed (Table III) and, consequently, the lower the socioeconomic status, the higher the infestation rates (Slonka et al., 1976; 1977; Sinniah et al., 1983). The differences among the three socioeconomic levels considered in Table III were highly significant ($P < 0.001$).

It appears that 5 to 6% of the population of Belo Horizonte is infested by *P. capitis*, irrespectively of age-groups or sex-groups, since each sample contained 5 to 6 haircuts and the mean percent of the barbershops infested was

29.5%. And since many people cannot afford a haircut, this prevalence would be underestimated.

Brazil has a population of 120 million, of which 68% live in urban areas. Of this populaton, 50% are under 20 years of age; 19% of these people are students. More than 30% of the dwellings have 1 bedroom only. These data indicate that *P. capitis* will continue to be a problem in Brazil for a long time.

RESUMO

Prevalência de lêndeas e piolhos em amostras de cabelo recolhidas do chão de barbearias e salões de beleza em Belo Horizonte, Estado de Minas Gerais, Brasil – Foi realizado um estudo de piolhos em amostras de cabelo recolhidas do chão de barbearias e salões de beleza de Belo Horizonte, Estado de Minas Gerais, Brasil, no período de outubro de 1984 a abril de 1985, como um meio alternativo para se determinar a prevalência da pediculose do couro cabeludo junto à população. Das 475 amostras examinadas em relação à presença de lêndeas, ninfas ou adultos de *Pediculus capitis*, 140 estavam infestadas (29,5%). Um total de 58 piolhos e 3.553 lêndeas foi encontrado em 33.632,9 g de cabelo coletado, correspondendo a uma relação de 0,10 lêndea/grama. Quase 29% das lêndeas eram viáveis e capazes de serem transmitidas após eclosão. Houve uma diferença significativa da infestação por níveis sócio-econômicos, assim como as amostras procedentes de salões masculinos foram as que se apresentaram mais infestadas. Considerando o número de cortes de cabelo por amostra, estima-se que 5 ou 6% da população poderia estar infestada por esta espécie.

Palavras-chave: piolhos – *Pediculus capitis* – piolhos do couro cabeludo – pediculose capitis – lêndeas

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