

Prevalence and monthly distribution of head lice using two diagnostic procedures in several age groups in Uberlândia, State of Minas Gerais, Southeastern Brazil

Prevalência e distribuição mensal do piolho da cabeça usando dois procedimentos de diagnóstico em vários grupos etários em Uberlândia, MG, Sudeste do Brasil

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ABSTRACT

Some epidemiological characteristics of head lice, Pediculus capitis, were studied using two procedures: cut hair analysis and head inspection. Higher prevalence rates were observed in the middle and at the end of the school terms. Both procedures indicated that children were the main reservoir for this type of pediculosis in Uberlândia.

Key-words: Head lice. *Pediculus capitis. Pediculosis in old people's homes. Brazil.*

RESUMO

Alguns aspectos da epidemiologia do piolho da cabeça, Pediculus capitis, foram estudados usando dois procedimentos: análise de cabelos cortados e inspeção das cabeças. As mais altas prevalências foram observadas no meio e no final dos semestres escolares. Ambos os procedimentos apontaram as crianças como o principal reservatório desta pediculose em Uberlândia.

Palavras-chaves: Piolhos da cabeça. *Pediculus capitis. Pediculose em asilos. Brasil.*

The head louse, *Pediculus capitis* (De Geer, 1778), is a human ectoparasite with worldwide distribution^{2,3,8}, including in Brazil^{1,5,7}. This ectoparasite is most frequently observed in children, but can be found in people of all ages^{5,8}. Hair characteristics, host socioeconomic background and overcrowded living conditions are related to head louse prevalence^{1,5,8}. Studies using procedures other than visual inspection of the head have been undertaken to obtain information on head louse prevalence and other epidemiological characteristics⁵. Such procedures seem to present advantages such as rapidness and fewer restrictions on assessing information.

In an earlier study, Borges & Mendes¹ inspected the heads of schoolchildren in rural and urban zones of the municipality of Uberlândia, State of Minas Gerais (MG). They found high prevalence rates and analyzed several characteristics that influenced head louse distribution in Uberlândia.

The present study had the aim of assessing the prevalence and monthly variation of head lice in people of various age groups, including the residents of old people's homes. The procedures of cut hair analysis and visual inspection of the head were used. In addition, the authors compared the sensitivity of the two techniques. This study was undertaken in the city of Uberlândia, MG, which has 501,214 inhabitants⁴.

Firstly, cut hair was collected twice a month, from November 1999 to October 2000 at two hairdressers located in downtown Uberlândia. The material was taken to the Parasitology Laboratory, Institute of Biomedical Sciences, Federal University of Uberlândia (UFU), and was examined using a stereoscopic microscope in conformity with the method of Linnardi et al⁵. The subjects were separated into three age groups: children, youths and adults, based on their physical appearances observed during their haircuts in the hairdressers. Samples considered positive were those on which

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adults and/or immature head lice were encountered, including eggs (nits). The results were used to infer the monthly variation and prevalence in the different age groups.

A second group of people was examined using two procedures: their heads were examined and, after that, their hair was cut, taken to the laboratory and examined as described above. The data obtained were used to compare the sensitivity of the two procedures. The people sampled by these two procedures were at that time being attended by social programs promoted by non-governmental institutions. This group of people was examined approximately one year after collecting the samples from the hairdressers.

In addition, the heads of residents at three out of the five old people's homes that existed in Uberlândia were examined. The data were compared using the chi-squared test at a significance level of 5% (Minitab® version 14 for Windows, www.minitab.com/products/minitab/14/).

The procedures for this study were detailed in a case submitted to and approved by the Ethics Committee of UFU (0015/2000).

The two salons investigated in this study were considered to be very affordable and they attracted people who were mostly

expected to have low incomes. Hair samples from 416 customers at the two hairdressers were obtained and 31 (7.4%) of them were positive (Table 1). The rate encountered among children up to 15 years old was significantly higher than the rate observed among older groups ($\chi^2 0.05, 1 = 6.139; P = 0.013$).

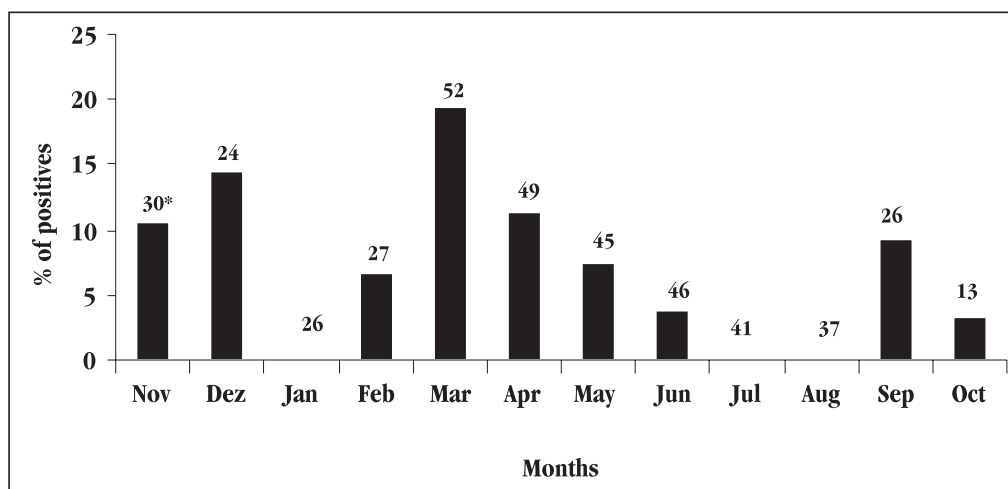
The prevalence presented monthly variations in distribution. The break between the semesters during the school year seemed to be the factor that influenced prevalence the most. Lower rates were observed during the school holiday months (January and July) and at the beginning of the second term (August). Higher rates were observed in the middle of the first term (March) and at the end of the second term (December) (Figure 1).

A total of 141 subjects were examined using the two diagnostic procedures. When the prevalence rates observed in this second group of people were compared, the rate found using head inspection (20.6%) was seen to be significantly higher than the rate using cut hair (10.6%) ($\chi^2 0.05, 1 = 5,278; P = 0.022$). In addition, cut hair analysis did not indicate any false negative subjects. Once again, differences between the rates found among children (24.2%) and among adults (10.6%) were observed in this second group of people ($\chi^2 0.05, 1 = 4,031; P = 0.045$).

Table 1 - Head lice according to inferred age groups by applying the diagnostic procedures of analyzing cut hair collected at two hairdressers and examining heads of residents in old people's homes, in Uberlândia, MG, from November 1999 to October 2000.

Age groups	Examined n ^a	Infested	
		n ^a	%
Children	98	13	13.3A*
Youths	196	11	5.6
Adults	119	7	5.4
Sub-total 2	315	18	5.7B*
Not determined	3	0	0.0
Total	416	31	7.5
Residents in old people's homes	90	5	5.5B*

A*B*: Sub-totals with different letters were statistically different among each other at 5% of significance.



* Number of samples examined.

Figure 1 - Monthly distribution of head lice in hair samples from 416 subjects, collected in two hairdressers in Uberlândia, State of Minas Gerais, Southeastern Brazil, from November 1999 to October 2000.

A total of 90 elderly people (between 41 and 100 years old) were examined at the three old people's homes. The rate of 5.5% encountered in these homes was close to what was observed among adults whose cut hair was collected from the salons and examined (Table 1).

The prevalence rate observed here by applying cut hair analysis was close to what was also estimated by Linardi et al⁵ using this methodology with modifications in several barbershops and beauty parlors in Belo Horizonte, MG. Despite the lower sensitivity of cut hair analysis, this procedure was shown to be an easy way of sampling people belonging to different age groups, including adults, and may be an alternative way for assessing groups in which there is reluctance to undergo direct examination. It is important to point out that some of the individuals considered positive by both procedures adopted here, may have presented vestigial infestation and/or only nits³.

Linardi et al⁶ also showed that the seasonal variation in head lice numbers in Belo Horizonte was related to school terms. Because almost all children in Uberlândia attend educational institutions⁴, the data of Borges and Mendes¹ together with the data presented here strengthen the hypothesis that educational institutions are the main places where children acquire head lice in Uberlândia and that they would also regulate infestation in the other age groups. Nevertheless, because people belonging to high-income population groups were not sampled in either of these studies, this hypothesis should be investigated in those groups, as well.

Living in closed communities is a factor that may predispose towards head louse infestation. It was therefore expected that high rates of head lice would be found among the residents of old people's homes. The relatively low rates encountered among

residents at two out of the three homes sampled could be related to the healthcare they seemed to be receiving in those institutions.

In conclusion, school-age children are indicated here as the main head louse reservoirs in Uberlândia. Despite lower sensitivity in comparison with head inspection, cut hair analysis is an alternative procedure for estimating the prevalence of head lice, particularly among groups that present restricted access to head inspections.

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