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Short Communication

Head lice infestation in school children of a low socio-economy area of Tabriz city, Iran

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Head lice infestation (HLI) caused by *Pediculus humanus* var *capitis* (*Pediculus capitis*) is a world wild public health concern that affects mostly school aged children. HLI does not produce an illness, but it is physically unpleasant and an unbearable social stigma. Over a five months period from July to November, 2006, 2795 school children from a low socio-economy area of Tabriz city enrolled in 13 elementary and high schools (governmental school) including 1948 girls (69.69 %) and 847 boys (30.30%) were examined for the presence of *Pediculus capitis* (nits, adults and immature). During this study all the infested cases were seen among girls and there was no infestation in boys. School girls aged 10-14 years constituted the highest infestation rate (6.5%) and the lowest infestation rate was seen in girls aged 15-18 years old (1.6%). The infestation rate in 5-9 years old children was 5.7%. The overall infestation rate in the studied population was 3.64%. There was a significant difference between infestation rates among the age groups (χ^2 = 15.43, df = 2, p = 0.0004). But there was no significant difference between the infestation rates of 5-9 and 10-14 groups (χ^2=0.36, df=1, p=0.55). Pediculosis is a public health issue in many parts of the world. Certainly, personal hygiene practices and socio-economic status influence the level of prevalence of pediculosis. The lowest infestation rate in 15-18 years old children in this study may indicates that the better personal hygiene practices including regular combing and washing of the hair is the main reason for reducing the head lice infestation rate in this group in comparison with the two other groups. The overall infestation rate in the present study is probably one of the lowest infestation rates in Iran and in the region.

Key words: Head lice, *Pediculus capitis*, school children.

INTRODUCTION

Head lice infestation (HLI) caused by *Pediculus capitis* is a world wild public health concern that affects mostly school aged children (Elston, 1999). HLI does not produce an illness, but it is physically unpleasant and an unbearable social stigma (Chesney and Burgess, 1998). In the United States 6-12 million persons are infested every year with head lice (Clore and Longyear, 1993) with an estimated $100 million being spent annually on treatment (Burgess, 1995). A number of surveys of school children populations, mainly in the US, have shown a low prevalence of head lice among black school children (Sokoloff, 1994). In African school children, higher prevalence has been found in non black children compared to black children in mixed communities (Chunge, 1986). The low incidence in the black children has been attributed to the use of hair-oils to straighten hair, which may coincidentally suffocate head lice (Green, 1898) or to an oval cross-sectional hair shape in Negroid hair, which is meant to be less favorable for head lice. However, a similar prevalence of head lice infestation in white, black and Asian school children has been reported from Brazil (de Madureira, 1991).

In the Middle East, head lice infestation is a public health issue. In Abha, Saudi Arabia, an infestation rate of 19.8% was reported among school boys between 9-11 years (Bahamdan et al., 1996). Eight percent of Leba-

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Table 1. Prevalence (%) of head lice infestation by age group and sex among school children in a low socio-economy area of Tabriz city.

Age group (years)	Male		Female		Prevalence (%)
	Number	Infested	Number	Infested	
5 – 9	**334**	**0**	**491**	**28**	**5.7**
10-14	257	0	1016	67	6.5
15-19	256	0	441	7	1.6
Total	847	0	1948	102	5.23

nese public school students harbor pediculosis (Saab et al., 1996), while 78% of school children in Lybia are infested (Bharija et al., 1988). In addition, in a community near Jerusalem, either living lice and eggs or only nits infested 11.2 and 23.4% of children, respectively (Mumcuoglu, 1990). In the old Gaza city and the rural village Jabalia within the Gaza Governorate the rate of infestation with lice was 14.1% in the primary school girls (Al-Shawa, 2006). In a high socio-economy area in Izmir, Turkey, 4.2% of the studied population of the secondary and elementary school children were infested with eggs and/or adults of *P. capitis* (Ilhan et al., 1997). Previous studies in different parts of Iran showed infestation rates of 5.1, 4.5, 2.2, 28.5 and 12%, mostly in the primary school children, in Rasht, Gilan province, Babol, Ardabil and Boushehr, respectively (Golchai and Ahmadi Ghajar, 2002; Pourbaba et al., 2004; Zabihi et al., 2005; Edalatkhah et al., 2005; Arjomanzadeh et al., 2001). In two other studies in Iran that were carried out in Kerman and Hamadan provinces, the overall infestation rates were 3.8 and 6.85%, respectively (Kamiabi and Nakhaei, 2005; Nazari et al., 2006). The present study was conducted to assess the head lice infestation rate in school children in a low socio-economy area of Tabriz city in Iran and to compare its result with the results of the other studies in Iran and with the results of some of the Middle Eastern and the other regional countries.

MATERIALS AND METHODS

This descriptive study was conducted between July and November, 2006 in urban area in Tabriz city, Iran. A total of 2795 school children from Tabriz city enrolled in 13 elementary and high school (governmental school) were examined for the presence of *P. capitis* (nits, adults and immatures).

A detailed questionnaire including age, sex, family size, a history of previous head lice infestation and other relevant data, was recorded (only the data for age and sex were included in the present paper). All the 13 schools were located in urban area of Tabriz city. Total of enrolled schools were 6 elementary schools and 7 high schools. The sample population was children ranging in age from 6–18 years old who were diagnosed with HLI in the health centre by health care employers. The diagnosis of HLI was confirmed by clinical inspection of scalp and hair under the light of a reading lamp and by using a manual magnifier for the presence of adult lice, nymphal stage or eggs (nits).

All the children, who were enrolled in the study, were assigned to 3 age groups. It was including 5 – 9, 10 – 14 and 15 – 19 years old. All positive cases were treated by 1 pct permethrin shampoo (permethrin 1%, FORE.Co.S.r.l. – Parma Italy).

In brief the parents were instructed to wash their children's hair with shampoo and recommended to apply shampoo on wet hair and massage the head. To support the action of the shampoo, it was recommended to let these act at least 3 min before rinsing. Thereafter the hair rinses with plenty of water and is towel dried.

Signification of the difference in the infested number for different age groups was assessed by Chi–square analysis using Epi Info 6.04.

RESULTS

Over a five months period, 2795 school children were examined in this study. Demographic characteristics and the result of the examinations of the participants are shown in Table 1. Of the 2795 examined school children, there were 1948 girls (69.69%) and 847 boys, (30.30%). During this study all the infested case had been seen among girls and there was no infestation in boys. School girls aged 10–14 years constituted the highest infestation rate (6.5%) and girls aged 15-19 years showed the lowest infestation rate (1.6%). The infestation rate in 5-9 years old children was 5.7%. Regardless of the ageing groups the overall infestation rate was 5.2%.

Signification of the difference in the infested number for different age groups was assessed by Chi – square analysis using Epi Info 6.04. There was a significant difference between infestation rates among the age groups (χ^2 = 15.43, df = 2, p = 0.0004). But there was no significant difference between the infestation rates of 5-9 and 10-14 groups (χ^2 = o.36, df = 1, p = 0.55).

All the infested case was treated with 1% permethrin shampoo. There was no re-treatment case.

DISCUSSION

Pediculosis is a public health issue in many parts of the world. Certainly, personal hygiene practices and socio-economic status influence the level of prevalence (Elston, 1999) and, therefore, human lice are considered as indicators of personal hygiene. Infestation rates among school children in some Middle Eastern and other regional countries have shown a range of infestation of 4.2 - 78% (Chunge, 1986; Green, 1898; De Madureira, 1991;

Bahamdan et al., 1996; Saab et al., 1996; Bharija et al., 1988; Mumcuoglu et al., 1990; Al-Shawa, 2006; Ilhan et al., 1997). The overall infestation rate in the present study was 3.64% that is one of the lowest rates among the reported results from the Middle Eastern and other regional countries. Results reported, mostly in primary school children, from different parts of Iran showed a rate between 2.2 to 28.5% (Golchai and Ahmadi Ghajar, 2002; Pourbaba et al., 2004; Zabihi et al., 2005; Edalatkhah et al., 2005; Arjomanzadeh et al., 2001; Kamiabi and Nakhaei, 2005; Nazari et al., 2006). In comparison with some of the results that have been reported from different parts of Iran, the over-all infestation rate of 3.64% in the present study and the results reported from Babol (Zabihi et al., 2005) are the lowest lice infestation rate that have been reported from Iran. The lowest infestation rate in 15-18 years old children in the present study may indicate that the better personal hygiene practices including regular combing and washing of the hair is probably the main reason for reducing the head lice infestation rate in this group in comparison with the two other groups who may need help from their parents for combing and washing their hairs.

In almost all previous studies in Iran and other parts of the world, the prevalence of head lice infestation in school boys was lower than the prevalence of the infestation in school girls. In the present study, surprisingly, no infestation was found in the studied school boys. The treatment was 1% permethrin shampoo, which was applied once. There was no retreatment case.

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