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Received: 9 May 2012
Revised: 4 Nov 2012
Accepted: 2 Dec 2012

The prevalence of pediculus capitis among the middle schoolchildren in Fars Province, southern Iran

Abstract

Background: Pediculosis capitis is a common parasitic infection of children. In this study we assessed the prevalence of head pediculosis among the middle schoolchildren in the urban and rural areas of Fars province, southern Iran.

Methods: All middle schoolchildren ages 11-14, in all the urban and rural areas of the province were screened for head lice infestation by examining their hair and scalp. The parents of the infested children were also examined. The study was repeated in the different seasons in the same areas. Moreover, the infested children were treated with permethrin shampoo and re-examined one week later for any relapse.

Results: The general prevalence of head lice infestation in middle school students was 0.23% in autumn, 0.27% in winter and 0.11% in spring. In all three seasons, pediculosis capitis prevalence was higher among females and in the rural areas. Treatment with permethrin shampoo was markedly more successful in males from both regions in all months except the urban areas in spring.

Conclusion: The results show that pediculus capitis is generally uncommon among Fars Province middle schoolchildren. It is needed that health providers promote health education programs especially in the rural areas.

Keywords: Pediculosis, Head Louse, Students, Permethrin

Caspian J Intern Med 2013; 4(1): 607-610

The three major lice that infest humans are pediculus humanus capitis (head lice), phthirus pubis (crab lice), and pediculus humanus corporis (body lice) (1). Pediculosis capitis has been well-known since antiquity (2). Infestation with pediculosis capitis or head lice is a common health problem that most commonly involved children between 5 and 13 years old (3, 4). It is the most common parasitic infection of children (5). Despite worldwide distribution, it is more commonly occurs in crowded living conditions and developing countries (5, 6). Although most infestations are asymptomatic, pediculosis capitis may result in considerable discomfort, parental anxiety, embarrassment to the child, unnecessary absence from school and work and also has adverse effects on the schoolchildren's academic performance by negatively affecting concentration (7-9). It is more common in girl's hair length, the frequency of shampooing and brushing does not influence the risk of head lice infestation, while head-to-head contact is by far the most common route of lice and may also be transmitted by inanimate objects such as clothes, hats, scarves, combs, towels, beddings, hair brushes and upholstered furniture or carpets (10-12). Most studies in pediculosis involved children of preschool and school. In this study, we assessed the prevalence of pediculosis capitis among the middle schoolchildren in Fars Province, southern Iran.

Methods

This school-based, cross-sectional study was conducted in Fars Province, southern Iran during 2005-2006.

All middle schoolchildren in all urban and rural areas of the province were screened for head lice infestation. Specially trained school health nurses in the study areas examined the children's hair and scalp for lice. The hair and scalp were examined for pediculus capitis (PC) by hand separation of the hair every 1-2 cm.

The presence of either live or dead eggs, or nits, regardless of morphologic features or localization was considered infestation with Pcapitis. If there was any suspicion of head lice, the child's hair was examined by an expert physician. In addition, parents of all infested children were examined for head lice infestation. This study was repeated in different seasons (autumn, winter, spring) in the same areas. Summer was ignored due to lack of access to students. Infested children were treated with permethrin-shampoo and re-examined one week later for relapse of head lice infestation. Chi square test was used to compare infestation rates of boys and girls, and pediculosis prevalence rates among the rural and urban areas and between the different seasons.

Results

Table 1 clearly summarized the results of this study. The general prevalence of head lice infestation in middle school students was 0.23% in autumn, 0.27% in winter and 0.115% in spring. In all three seasons, the prevalence was higher among the girls as compared to boys and the difference was statistically significant. Head pediculosis was also

significantly more prevalent among the students in the rural areas as compared to the urban regions.

In autumn, 7 and 17 family members of the infected females from the urban and rural regions were infected, respectively, while there was no infected individual in the family members of the male students with head pediculosis from the urban and rural regions. In winter, head pediculosis was detected in 25 and 52 family members of the infected females from the urban and rural regions, respectively, while these were the same for the 3 males. In spring, the number of infected family members of the urban and rural female students with head pediculosis were 2 and 16 schoolchildren, respectively.

No family members of the infected male students of either the urban or rural regions had head pediculosis. The students with head pediculosis were treated with permethrin shampoo. In autumn, treatment failed in 9.5% (9 out of 94) of infected females from the rural regions, but it was successful in all the infected females from the urban and also males from both regions.

In winter, treatment with permethrin shampoo failed in 30.5% (26 of the 85) and 10.6% (14 of the 131) of the infected females from the urban and rural regions, respectively, however, 5% in males come from the rural areas, while it was successful in all the infected males from the urban regions. In spring, treatment failure was observed in 3.3% (2 out of 61) and 100% (1 from 1) of females from the rural and males from the urban regions, respectively. But it was successful in others.

Table 1. Head lice among middle school students in Fars province-Iran

Season	Region	Examined Students (No)	Infested students No (%)	Treatment Failure No (%)	Infested family members No (%)	P-Value (Sex)	P-Value (region)
Autumn	Urban area	F=17117 M=14099	69 (0.40) 0 (0)	0 (0) 0 (0)	7 (0.04) 0 (0)	0.001	0.001
	Rural Area	F=20128 M=21016	94 (0.46) 4 (0.019)	9 (9.57) 0 (0)	17 (0.08) 0 (0)		
Winter	Urban area	F=22956 M=15017	85 (0.37) 12 (0.07)	26 (30.5) 0 (0)	25 (0.1) 3 (0.01)	0.001	0.001
	Rural Area	F=28332 M=24331	131 (0.46) 20 (0.08)	14 (10.6) 1 (5)	52 (0.18) 3 (0.01)		
Spring	Urban Area	F=12766 M=10860	4 (0.03) 1 (0.009)	0 (0) 1 (100)	2 (0.01) 0 (0)	0.001	0.001
	Rural Area	F=22403 M=20617	61 (0.27) 11 (0.05)	2 (3.27) 0 (0)	16 (0.07) 0		

Discussion

Infestation with pediculosis capitis or head lice is a common health problem that most commonly involved children between 5 and 13 years old (3, 4). Despite worldwide distribution, it occurred more commonly in crowded conditions and developing countries (5, 6). Infestation rates in some Middle East and other regional countries have shown a range of 4.2-78% among schoolchildren (13). Population-based studies in European countries show highly diverging prevalences, ranging from 1% to 20% (14). Most studies in pediculosis are among primary schoolchildren thus, we did not have sufficient data to compare with this study. Several studies with different results have been conducted in Iran on the prevalence of pediculosis capitis. Nazari and Saidijam reported general prevalence of 6.9 % among primary schoolchildren in Hamedan (15). Infestation rate was 3.8 % in primary schoolchildren in Kerman (16). Shayeghi et al, explained that the total prevalence of head lice infestation was 4.8 % in East Azerbaijan among primary school pupils (17).

The total prevalence of head pediculosis among primary schoolchildren in Fars Province was 0.49%, 0.37% and 0.20% in autumn, winter and spring, respectively (9). We think that the differences in prevalence rate in Iran are due to the differences in climate and sample size. This study showed that the overall prevalence of pediculosis capitis infestation among the middle schoolchildren of Fars Province, southern Iran was 0.23% in autumn, 0.27% in winter and 0.115% in spring. These values are lower than the primary school that we previously reported (9).

Several studies have shown the risk factors for infestation with pediculosis capitis including female sex, living in rural areas, crowded families, low socioeconomic status, low educational level, children with age less than 11 years old, previous infestation, long hair length, lack of bathing facilities and sharing of articles (e.g. combs, scarves) (15-20). In our study, although the total prevalence was low, it was higher in girls and rural areas.

The treatment failure rate was also higher in girls except for the urban areas in spring. Most studies revealed the predominance of infestation in girls (21-23). This is may be due to the increase of close contact and tendency for covering hair in girls (24, 25). With regard to this study, many articles showed the higher prevalence of pediculosis capitis in rural areas. Increased prevalence of infestation in rural areas may be due to lower health and socioeconomic

status. We concluded that although pediculosis is not a significant health problem in middle schoolchildren in Fars province but health providers must improve health education programs especially in the rural areas and among girls.

Acknowledgments

The authors would like to thank the Vice Chancellory of Health Affairs for their utmost cooperation.

Funding: The present study was conducted based on a self-funded basis.

Conflict of Interest: The authors declare that they have no conflicts of interest.

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