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Asian Pacific Journal of Tropical Biomedicine

journal homepage: www.elsevier.com/locate/apjtb

Original article http://dx.doi.org/10.1016/j.apjtb.2016.03.002

Pediculosis capitis among primary and middle school children in Asadabad, Iran: An epidemiological study

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ARTICLE INFO

Article history:
Received 29 Sep 2015
Received in revised form 15 Oct, 2nd revised form 26 Oct, 3rd revised form 10 Dec, 4th revised form 25 Dec 2015
Accepted 15 Jan 2016
Available online 10 Mar 2016

Keywords:
Head lice
Pediculosis
School students
Prevalence
Epidemiology

ABSTRACT

Objective: To investigate the prevalence of head lice in primary and middle school children in Asadabad, Iran.
Methods: This study is an analytical descriptive cross-sectional one conducted among primary and middle school children in Asadabad during the academic year of 2013–2014. Data were collected at baseline via questionnaire, checklist and head examination.
Results: A total of 600 students were examined (412 girls and 188 boys), and 14 students showed pediculosis. And the total prevalence rate was 2.3% (3.2% girls and 0.5% boys). The infestation was equal in public and private schools. The rate of pediculosis was higher in students of primary schools (4.0%) than those in middle schools (0.7%). The age of the students ranged from 6 to 14 years. The total number of infected group was 14 with mean age of 8.93 ± 2.43 years, and it was 586 with mean age of 10.98 ± 2.82 years for the un-infected group who were enrolled in the study ($P < 0.01$). This study showed significant differences between students with curly hair (5.5%) and those with straight hair (1.9%) when compared in terms of head lice infestation ($P < 0.05$). The relations of pediculosis and other socioeconomic factors such as sharing common comb and a room with other people, frequency of bathing, and parents' profession and education were analyzed, and *Chi*-square test did not show a statistically significant relationship between head lice contamination and the abovementioned socioeconomic factors ($P > 0.05$).
Conclusions: It is necessary to find the risk factors of the infection in order to understand how to control or decrease infection in students, considering the important role of health education in reduction of head lice infections.

1. Introduction

The head louse, pediculus humanus capitis (De Geer, 1778) (Anoplura: Pediculidae), is a worldwide community health concern [1]. Pediculosis represents an emerging social problem in all parts of the world and in every race, socioeconomic status, family background, or personal habit [2,3]. Head lice is usually diagnosed by three different manifestations including itching and inflammation of the scalp and neck, sighting of lice, and detection of eggs attached to hair shafts [4,5]. The head louse is a kind of blood-sucking insect which can cause pruritus (that is the most common symptom), excoriation, conjunctivitis, and secondary bacterial infestations [6]. Lice infestation dates back to 25 million years ago in primates [7]. Fertilized eggs of sucking lice are called nits and are firmly cemented to the hair shaft. Subsequently, eggs develop through three nymph instars before reaching adulthood [8]. Pediculosis is more common in young girls and those in crowded families, especially because of using similar hair products [9]. Schools, particularly primary ones, are places which play the main role in starting the prevalence of contagious disease and infestations such as the pediculosis epidemic [10]. Almost all human head lice and scabies infestations occur by direct host-to-host contact [11–13].

Many studies have been performed in Iran, comparing the social status and the rate of pediculosis in different cities. In the city of Asadabad, no studies have been recently done on

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The study protocol was performed according to the Helsinki declaration and approved by the Ethics Committee of Research Deputy of Hamadan University of Medical Sciences, Hamadan, Iran. Informed written consent was obtained from participants.

Foundation Project: Supported by Hamadan University of Medical Sciences (Grant No. 9212134352).

Peer review under responsibility of Hainan Medical University. The journal implements double-blind peer review practiced by specially invited international editorial board members.

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pediculosis infestation levels. Therefore, the aim of this work is to investigate the prevalence of head lice in primary and middle school children in Asadabad, Iran. In addition, the influence of different risk factors on pediculosis infestation such as gender, hair characteristics, and socioeconomic factors have been studied.

2. Materials and methods

2.1. Study area

Asadabad is a city in Hamadan Province, Iran. It lies at 34°37′–34°50′ N, 47°51′–47°90′ E, and altitude of 1 591 m. It has a population of 59 617, making it the 5th biggest city in Hamadan (Figure 1).

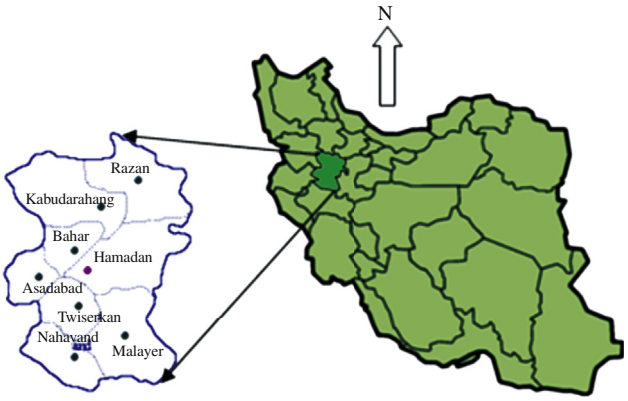

Figure 1. Location of Asadabad City in Hamadan Province, Iran.

2.2. Samples and data collection

The present research is an analytical descriptive cross-sectional study, conducted among primary and middle school children in Asadabad, Iran during the academic year of 2013–2014. Questionnaire, checklist, and head examination were the means to gather data at baseline.

The sample size was determined by considering an expected prevalence (P) of 50% with a 95% confidence and using the formula $n = z^2 \times P(1 - P)/d^2$ in which z = 1.96 and d = 0.04, which resulted in 600 (188 boys and 412 girls) children.

In the second stage, the schools were selected according to their geographical distribution to cover the whole district, and they represented public and private schools (16 primary and middle schools were randomly selected in Asadabad, and the students were systematically selected in these schools).

In order to evaluate the influence of socioeconomic factors on pediculosis prevalence, an epidemiological survey was designed to record information about gender, type of school, hygiene teacher, job and education of parents, qualified private bedroom, sharing a bed and blanket, frequency of bathing, sharing common comb, hair characteristics, and number of family members. The criteria for diagnosis of pediculosis were the presence of at least one living adult, nymph, or viable nit [14].

2.3. Statistical analysis

The *Chi*-square test for homogeneity of proportions was employed to compare the prevalence between some variables. Confidence intervals of 95% for prevalence were determined. The results were presented as mean ± SD for quantitative variables. The statistical analysis was conducted with statistical software SPSS version 20.

3. Results

A total of 600 students were examined (412 girls and 188 boys) among which only 14 students showed pediculosis, and the total prevalence rate was 2.3%. Pediculosis was more frequent in girls (13 out of 412, 3.2%) than boys (1 out of 188, 0.5%) ($P < 0.05$).

The infestation was equal in public schools (2.3%, $n = 514$) and private schools (2.3%, $n = 84$) ($P > 0.05$). The rate of pediculosis was higher in primary schools (4.0%, $n = 303$) than middle schools (0.7%, $n = 297$) ($P < 0.01$).

The age of the students ranged from 6 to 14 years. The total number of the infected group was 14 with mean age of 8.93 ± 2.43 years, and it was 586 with mean age 10.98 ± 2.82 years in the uninfected group who were enrolled in the study ($P < 0.01$).

The prevalence of head lice infestation was influenced by socioeconomic factors, as 8.5% of the infected cases had more than three family members. In this study, the pediculosis infestation in school children who had hygiene teacher (1.8%) was less than those who did not (5.6%, $P < 0.05$). This study confirmed significant differences between hair shapes when compared with head lice infestation ($P < 0.05$). The prevalence of pediculosis in school children who had straight and curly hair was 1.9% and 5.5%, respectively (Table 1).

Table 1
Head louse infestation in school pupils according to some socioeconomic factors in Asadabad, Iran, 2013–2014. *n* (%).

Characteristics		Infected	Uninfected	Total	*P* value
Having hygiene teacher	Yes	9 (1.8)	502 (98.2)	511 (85.2)	0.043
	No	5 (5.6)	84 (94.4)	89 (14.8)	
No. of family members	≤ 3	10 (1.8)	543 (98.2)	553 (92.2)	0.003
	> 3	4 (8.5)	43 (91.5)	47 (7.8)	
Sharing common comb	Yes	5 (3.5)	137 (96.5)	142 (23.7)	0.283
	No	9 (2.0)	449 (98.0)	458 (76.3)	
Sharing a room with other people	Yes	6 (1.9)	318 (98.1)	324 (54.0)	0.397
	No	8 (2.9)	268 (97.1)	276 (46.0)	
Frequency of bathing	Once a week	3 (2.0)	145 (98.0)	148 (24.7)	0.776
	> Once a week	11 (2.4)	441 (97.6)	452 (75.3)	
Father's profession	Unemployed	2 (3.3)	59 (96.7)	61 (10.2)	0.229
	Businessmen	7 (1.7)	414 (98.3)	421 (70.2)	
	Government	5 (4.2)	113 (95.8)	118 (19.6)	
Mother's profession	Housewife	13 (2.4)	521 (97.6)	534 (98.0)	0.691
	Businessmen	0 (0.0)	29 (100.0)	29 (4.8)	
	Government	1 (2.7)	36 (97.3)	37 (6.2)	
Father's education	Illiterate	3 (7.0)	40 (93.0)	43 (7.2)	0.054
	Initial education	7 (1.6)	435 (98.4)	442 (73.7)	
	University education	4 (3.5)	111 (96.5)	115 (19.2)	
Mother's education	Illiterate	2 (2.4)	82 (97.6)	84 (14.0)	0.917
	Initial education	11 (2.4)	442 (97.6)	453 (75.5)	
	University education	1 (1.6)	62 (98.4)	63 (10.5)	
Hair shape	Straight	10 (1.9)	517 (98.1)	527 (78.8)	0.023
	Curly	4 (5.5)	69 (94.5)	73 (12.2)	

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