

Epidemiology and Morbidity of Head Lice Infestation in Khorram-shahr County, Iran (2006-2009)

Hamid Kassiri¹, Ali Kasiri²,
Niusha Kasiri², Fahimeh
Moeininejad¹

¹Health Faculty, Ahvaz Jundishapur
University of Medical Sciences, Ahvaz,
Iran;

²Medicine Faculty, Ahvaz Jundishapur
University of Medical Sciences, Ahvaz,
Iran

Correspondence:

Hamid Kassiri, PhD;
Health Faculty,
Ahvaz Jundishapur University of Medical
Sciences,
Ahvaz, Iran

Tel: +98 611 33738269

Fax: +98 611 33738282

Email: Hamid.Kassiri@yahoo.com

Received: 4 November 2014

Revised: 15 January 2015

Accepted: 13 February 2015

Abstract

Background: Pediculosis capitis is a continuous common health problem worldwide. *Pediculus capitis* distributes quickly in overcrowded regions. The goal of the present research was to determine some epidemiological features of head lice infestation in Khorram-shahr County, southwestern Iran.

Methods: This descriptive cross-sectional study was conducted on the patients with head lice infestation who referred to the Khorram-shahr Health Center during 2006 to 2009. The gold standard in the diagnosis of infestation was the detection of living nymphs, adults and/or nits on the scalp and hair. After the visual inspections with using a lens and the aid of an ordinary comb, cases were asked to complete a data gathering form containing some questions about demographic and epidemiologic features. The collected information was evaluated using SPSS software, version 11.5.

Results: Totally, 1091 patients were infested with pediculosis capitis. The overall prevalence of head lice infestation during the four- year period was 0.73%. Girls were significantly more infested (87.2%) than boys (12.8%). Pediculosis capitis infestations were highest (46.2%) in subjects aged 6-10 and lowest in those aged less than six (6.4%). The majority of cases lived in the rural areas. The percentage of infestation in rural and urban patients was 59.2% and 40.8%, respectively. Nearly, 11.8% of the patients with head lice had a history of infestation. Most of the cases were found in the Autumn (35.8%).

Conclusion: Girls were more frequently infested with *Pediculus capitis* than boys. It can also be concluded that head lice infestation is not highly prevalent in Khorram-shahr.

Please cite this article as: Kassiri H, Kasiri A, Kasiri N, Moeininejad F. Epidemiology and Morbidity of Head Lice Infestation in Khorram-shahr County, Iran (2006-2009). *J Health Sci Surveillance Sys*. 2015;3(2):83-87.

Keywords: *Pediculus capitis*, Epidemiology, Morbidity, Iran

Introduction

Human head louse, *Pediculus capitis* (Anoplura: Pediculidae) is a serious health challenge in many parts of the world. Head lice gives rise to important public health problems in various societies, mainly among the school aged children (5-14 years). Head louse is an important infestation related to the societies with poor hygiene. Pediculosis capitis commonly infests people with low health condition, and this is a significant problem among the homeless people and in refugee campsites.¹⁻⁴

Head louse is an obligate ectoparasite which is detected on the scalp and hair and transferred mainly via direct contact with the hair of an infested person.⁵ The most prevalent method of getting this infestation is head-to-head contact with an individual who formerly has *Pediculus capitis*. These insects are not confirmed to transmit any disease, but secondary bacterial infection of the skin resulting from scraping can occur with any type of lice (such as head louse, body louse, and pubic louse).⁶ Head lice infestation is frequently recognized by seeing adult/nymph lice,

annoyance, inflammation, pruritus, and also detection of nits attached to hairs. Moreover, *P. capitis* gives rise to both psychological pressure and physical symptoms.⁷ However, body lice (*Pediculus humanus*) are vectors of diseases such as epidemic relapsing fever, trench fever, and epidemic typhus.⁸

It is estimated that about 6-12 million infestations are found among children 3-11 years old in the United States every year. Research has proposed that girls acquire head lice more frequently than boys, probably because of more repeated head-to-head contact.⁶ In addition, the great rate of infestations has been found throughout the world, ranging from 1.6% to 87%.⁹ A study carried out among school children aged 8-16 years in Peshawar, Pakistan in 1986 showed an overall prevalence of 46%, with girls having a higher prevalence rate (49%) than boys (40%).¹⁰ A survey conducted from November 2002 to May 2003 among the girls in primary schools of Iranshahr, southeastern Iran, showed the prevalence rate to be 27.1%.¹¹ A similar study in the Aran and Bidgol of Isfahan Province, Iran, showed that the infestation rate was 0.47% during 2008.¹²

Objective

Since no study has been conducted on the prevalence of head lice infestation in Khorram-shahr, this study was done. The aim of the present research was to determine some epidemiological features of pediculosis capitis in this part of Iran.

Methods

This descriptive cross-sectional research was done in Khorram-shahr, Khuzestan Province, Iran during 2006-2009. This research was discussed in research committee of medical entomology department and after making the required modifications, it was approved. The subject's scalp and hair were inspected by some trained health workers under the supervision of a medical entomologist. The existence of *P. capitis* infestation was confirmed by

careful clinical visual examination of the hair and scalp using a hand held magnifying glass, after parting the hair with the aid of an ordinary plastic comb; for the presence of nits and living adult or nymph lice, behind the ears and the back of the neck were particularly considered. The hair and scalp of each subject were inspected for a minimum of five minutes using a comb (about 0.5 mm of distance between the teeth). The gathered lice and hair with nits, from the infested person's hair, were preserved in 70% ethyl alcohol and then transferred to the laboratory for observation under a light microscope.

In addition, a data gathering form was used including questions on age, sex, year, month, season, geographical region, type of lice, and infestation history. The form focusing on epidemiologic and demographic data of head lice infestation was filled out by face to face interview. The data were analyzed using Statistical Package for Social Science (SPSS), version 11.5, for Windows 14 program.

Results

Over a four years period, 1091 infected patients were seen after inspecting their heads in this study. The maximum prevalence of head lice infestation in this study was in 2007. The highest frequency of the disease with head lice was documented for 2007 with 31.8%. The results also indicated that of the 1091 patients, there were 951 females (87.2%) and 140 males, (12.8%). Cases aged 6-10 years constituted the highest infestation rate (46.2%) and those aged less than six years showed the lowest infestation rate (6.4%). In the rural region, more cases had lice infestation (59.2%) as compared to 40.8% in urban areas. Furthermore, the results of this study indicated that the infestation rate in 11-17 year-old patients was 32.6% (Table 1). All the infested patients were treated once with 1% Permethrin shampoo.

Considering the type of lice, head lice infestation was more common than body lice infestation. Head lice and body lice infestations were estimated to be 99.8% and 0.2%, respectively. These two species are morphologically very similar and adapted to living on

Table 1: Frequency distribution and prevalence rate of head lice infestation in Khorram-shahr County according to sex, geographical area and age group, Khuzestan province, Iran (2006-2009)

Year	Frequency No. (%)	Prevalence /1000 People	Sex		Geographical area		Age group			
			Male No. (%)	Female No. (%)	Rural area No. (%)	Urban area No. (%)	< 6 No. (%)	6-10 No. (%)	11-17 No. (%)	≥18 No. (%)
2006	287 (26.3)	1.8	12 (4.2)	275 (95.8)	226 (78.7)	61 (21.3)	15 (5.2)	92 (32)	106 (36.9)	74 (25.8)
2007	347 (31.8)	2.2	21 (6.1)	326 (93.9)	173 (49.9)	174 (50.1)	10 (2.9)	215 (61.9)	98 (28.2)	24 (6.9)
2008	215 (19.7)	1.4	68 (31.6)	147 (68.4)	174 (50.1)	79 (36.7)	18 (8.9)	88 (40.9)	67 (31.2)	42 (19.5)
2009	242 (22.2)	1.5	39 (16.1)	203 (83.9)	111 (45.9)	131 (50.1)	27 (11.2)	109 (45)	85 (35.1)	21 (8.7)
Total	1091 (100)		140 (12.8)	951 (87.2)	646 (59.2)	445 (40.8)	70 (6.4)	504 (46.2)	356 (32.6)	1611 (14.8)

the head and body, respectively. The patients with head lice could be found in all months. Approximately, 23.4% of the cases with head lice were detected in December (Table 2).

The infestations mainly occurred in the Autumn (35.8%) and winter (26.2%), respectively. Nearly, 11.8% of the patients with head lice were infested for the second or the third time (Table 3).

Table 2: Frequency distribution of head lice infestation in Khorram-shahr County according to month, Khuzestan province, Iran (2006- 2009)

Month	Year 2006		2007		2008		2009		2006-2009	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
April	23	(8)	11	(3.2)	18	(8.4)	18	(7.4)	70	(6.4)
May	20	(7)	10	(2.9)	22	(10.2)	21	(8.7)	73	(6.7)
June	23	(8)	8	(2.3)	14	(6.5)	17	(7)	62	(5.7)
July	26	(9)	17	(4.9)	18	(8.4)	15	(6.2)	76	(7)
August	23	(8)	7	(2)	5	(2.3)	26	(10.7)	61	(5.6)
September	28	(9.7)	21	(6)	7	(3.2)	16	(6.6)	72	(6.6)
October	6	(2.1)	7	(2)	9	(4.2)	8	(3.3)	30	(2.7)
November	33	(11.5)	2	(0.6)	23	(10.7)	48	(19.8)	106	(9.7)
December	17	(5.9)	202	(58.2)	17	(8)	19	(7.9)	255	(23.4)
January	18	(6.3)	9	(2.6)	39	(18.1)	28	(11.6)	94	(8.6)
February	53	(18.5)	14	(4)	18	(8.4)	12	(5)	97	(8.9)
March	17	(5.9)	39	(11.2)	25	(11.6)	14	(5.8)	95	(8.7)
Total	287	(100)	347	(100)	215	(100)	242	(100)	1091	(100)

Table 3: Frequency distribution of head lice infestation in Khorram-shahr County according to infestation history and seasons, Khuzestan province, Iran (2006- 2009)

Year	Infestation history		Seasons			
	Yes No.	No No.	Spring No.	Summer No.	Autumn No.	Winter No.
2006	3 (1.1)	284 (98.9)	66 (23)	77 (26.8)	56 (19.5)	88 (30.7)
2007	44 (12.7)	303 (87.3)	29 (8.3)	45 (13)	211 (60.8)	62 (17.9)
2008	15 (7)	200 (93)	54 (25.1)	30 (14)	49 (22.8)	82 (38.1)
2009	67 (27.7)	175 (72.3)	56 (23.1)	57 (23.6)	75 (31)	54 (22.3)
Total	129 (11.8)	926 (88.2)	205 (18.8)	209 (19.2)	391 (35.8)	286 (26.2)

Discussion

In this study, the infestation rates of 0.19%, 0.23%, 0.14%, and 0.16% were found in the years of 2006-2009, respectively. According to the results of this study, the overall prevalence of infestation with head louse in Khorram-shahr was nearly 1.7/1000/4 years, which is lower than other studies in Iran; this indicates the role and efficiency of health services center in preventing the disease. Mohammadi-Azni found out the infestation rate as 3.6% at the primary schools in Damghan, Iran.⁷ Shahraki and colleagues in their study on the elementary pupils of Yasouj city and Rafiei and colleagues on the elementary girls' schools of Ahvaz found out the infestation rate as 21.8% and 11%, respectively.^{2,13} The prevalence of pediculosis capitis infestation was 8% among primary school pupils in Paveh city, Kermanshah province, Iran, in the years of 2009 to 2010. In addition, the rates of head lice infestation among school pupils in other countries in the world have revealed a wide range of variation of nearly 5%- 78% since 1965.¹⁴

Individuals aged 6-10 years old were most often infested with pediculosis capitis, which could be due

to their head to head contact and their age.^{15,16} It seems that those younger people are dependent on parents for washing and cleaning or combing their hairs. This assists quick detection of head lice infestation before its establishment. In the present study, girls were 6.8 times more likely to have head lice infestation than boys. Our findings are similar to some research showing the higher prevalence of head lice infestation among women.¹⁷⁻¹⁹

The total prevalence of *P. capitis* infestation was 35.8% in the Autumn, 26.2% in the Winter, and 19.2% in the Summer. The cold weather necessitates warmer clothing that might enhance the risk of head lice infestation. Persons infested in the past (11.8%) were less than those who had not been infested (88.2%). In a study in Turkey, infestation of patients with head lice in the past was more common compared with those who had never had head lice.²⁰

This survey had two limitations. First, since detection of infestation was made by visual screening, several people with low level of head lice infestation might have been missed. Some researchers have shown that visual examination is less accurate than applying

a louse comb, and may underestimate the accurate prevalence of pediculosis capitis infestation.²¹⁻²³ Second, the type of data gathering form we used was unable to assess the occupation, using common items, family size, parents' education, number of hair washing per week, number of hair brushing per day and so on. A strong point of this study was to use two methods (visual screening and head lice comb) to detect the infestation.

Conclusion

It can be concluded that head lice infestation is not highly prevalent in Khorram-shahr. The controlling program must be performed more efficiently to prevent the prevalence of pediculosis capitis. It is suggested that the people's knowledge and attitude about biology, clinical presentation, prevention, and treatment strategies of head lice infestation should be improved. Further epidemiological investigations are required to obtain more information on pediculosis in Khorram-shahr. Also, we emphasize the active and major role of health education for teachers and schools in order to prevent and manage head lice.

Acknowledgements

The authors would like to thank the Office of Vice Chancellor of Health Affairs for their cooperation to perform this study. We thank the health center staff of Khorram-shahr especially Mrs. Shahnaz Kazemi, who so willingly agreed to participate in this research. This study was financially supported by Ahvaz Jundishapur University of Medical Sciences (Project No. 89S90).

Conflict of Interest: None declared.

References

- 1 Kasiri H, Amani H. An epidemiological study of pediculus capitis infestation in the cases of attending to the Azna health centers, Lorestan province, Iran (2007). *Health Sci J* 2000; 2(3): 57-65. [Abstract in English].
- 2 Rafie A, Kasiri H, Mohammadi Z, Haghhighizade M. Pediculosis capitis and its associated factors in girl primary school children in Ahvaz City in 2005-2006. *Iran J Infect Dis Trop Med* 2009; 45: 41-5. [Abstract in English].
- 3 Shayeghi M, Paksa A, Salimabadi Y, Saneidehkoordi A, Ahmadi A, Eshaghi M, et al. Epidemiology of head lice infestation in primary school pupils, in Khajeh City, East Azerbaijan Province, Iran. *Iranian J Arthropod-Borne Dis* 2010; 4(1): 42-6.
- 4 Bibi F, Tasawar Z, Ali Z. The prevalence of human pediculosis in Kot Addu District Muzaffargarh (Punjab) Pakistan. *J Anim Plant Sci* 2011; 21(2 Suppl): 364-7.
- 5 Yousefi S, Shamsipoor F, Salim-Abadi Y. Epidemiological study of head louse (*Pediculus humanus capitis*) infestation among primary school students in rural areas of Sirjan County, South of Iran. *Thrita J Med Sci* 2012; 1(2): 53-6.
- 6 Centers for Disease Control and prevention. [Cited: 2013 24 September]. Available from: <http://www.cdc.gov/parasites/lice/head/epi.html>.
- 7 Rassami W, Soonwera M. Epidemiology of pediculosis capitis among schoolchildren in the eastern area of Bangkok, Thailand. *Asian Pac J Trop Biomed* 2012; 2(11): 901-4.
- 8 Mohammadi-Azni S. Prevalence of head lice at the primary schools in Damghan. *Zahedan J Res Med Sci* 2014; 16(11): 47-9.
- 9 Falagas ME, Mathiou DK, Rafailidis PI, Panos G, Pappas Q. Worldwide prevalence of head lice. *Emerg Infect Dis* 2008; 14(9): 1493-4.
- 10 Mahmud S, Gregory Pappas G, Wilbur C, Hadden W. Prevalence of head lice and hygiene practices among women over twelve years of age in Sindh, Balochistan, and North West Frontier Province: National Health Survey of Pakistan, 1990-1994. *Parasit Vectors* 2011; 4(11): 1-10.
- 11 Alempour Salemi J, Shayeghi N, Zeraati H, Akbarzadeh K, Basseri H, Ebrahimi B, et al. Some aspects of head lice infestation in Iranshahr Area (Southeast of Iran). *Iranian J Publ Health* 2003; 32(3): 60-3.
- 12 Doroodgar A, Sadr F, Doroodgar M, Doroodgar M, Sayyah M. Examining the prevalence rate of *Pediculus capitis* infestation according to sex and social factors in primary school children. *Asian Pac J Trop Dis* 2014; 4(1): 25-9.
- 13 Shahraki GH, Azizi K, Yousefi A, Fararue M. Head louse infestation rate of primary school students in Yasuj city. *J Yasuj Univ Med Sci* 2001; 6(21, 22): 22-3. [Abstract in English].
- 14 Vahabi B, Vahabi A, Gharib A, Sayyad M, Sayyad S. Prevalence of head louse infestations and factors affecting the rate of infestation among primary schoolchildren in Paveh City, Kermanshah Province, Iran in the years 2009 to 2010. *Life Sci J* 2013; 10(12s): 360-4.
- 15 Vahabi A, Shemshad K, Sayyad M, Biglarian A, Vahabi B, Sayyad S, et al. Prevalence and risk factors of *Pediculus (humanus) capitis* (Anoplura: Pediculidae), in primary schools in Sanandaj City, Kurdistan Province, Iran. *Trop Biomed* 2012; 29(2): 207-11.
- 16 AL-Shawa RM. *Pediculus capitis*, infestation according to sex and social factors in Gaza Governorate. *The Islamic University Journal (Series of Natural Studies and Engineering)* 2008; 16(1): 75-83.
- 17 Balcioglu C, Kurt O, Emin Limoncu M, Dinc G, Gumus M, Kilimcioglu AA, et al. Rural life, lower socioeconomic status and parasitic infection. *Parasitol Int* 2007; 56: 129-33.
- 18 Catala S, Junco L, Vaporaky R. Pediculosis capitis infestation according to sex and social factors in

- Argentina. Rev Saude Publica 2005; 39: 438-43.
- 19 Davarpanah MA, Mehrabani D, Khademolhosseini F, Mokhtari A, Bakhtiari H, Neirami R. The prevalence of *Pediculus capitis* among school children in Fars Province, Southern Iran. Iranian J Parasitol 2009; 4(2): 48-53.
- 20 Değerli S, Malatyal E, Mumcuoğlu KY. Head lice prevalence and associated factors in two boarding schools in Sivas. Turkiye Parazitol Derg 2013; 37: 32-5.
- 21 Jahnke C, Bauer E, Hengge UR, Feldmeier H. Accuracy of diagnosis of *Pediculosis capitis*: Visual inspection vs. wet combing. Arch Dermatol 2009; 145: 309-13.
- 22 Mumcuoglu KY, Friger M, Ioffe-Uspenky I, Ben-Ishai F, Miller J. Louse comb versus direct visual examination for the diagnosis of head louse infestations. Pediatr Dermatol 2001; 18: 19-21.
- 23 Magalhães P, V. Figueiredo E, P. Capingana D. Head lice among primary school children in Viana, Angola: Prevalence and relevant teachers' knowledge. Human Parasitic Diseases 2011; 3: 11-18.