Original Article

Increasing Trend of Pediculosis (*Pediculus Humanus Capitis*) in Lamerd, Farashband, and Marvdasht Cities, Southern Iran

Zahra Soltani[1], Davood Keshavarzi[2]

[1]Communicable Disease Unit, Faculty of Health, Shiraz University of Medical Sciences, Shiraz, [2]Department of Medical Entomology and Vector Control, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Aim: The aim of this study was to report the trend of pediculosis among people in Lamerd, Farashband, and Marvdasht cities, Southern Iran. **Materials and Methods:** This study was a retrospective study of patients with a definite diagnosis of *Pediculus humanus capitis* in 2012–2015. Information recorded for each patient included the gender, age, residence, and the season of diagnosis. **Results:** In Lamerd, Marvdasht, and Farashband, the total numbers of pediculosis cases were 1675, 954, and 509 cases, respectively. In those three cities, the highest number of cases was found in the year 2015 (1568 n) and lowest was in 2012 (431 n). This difference was statistically significant ($P < 0.05$). In all cities, the number of females (2921 n) was higher than males (217 n) ($P < 0.05$). The highest prevalence of disease was seen in female children between the ages of 6–12 years (1787 n) while the lowest prevalence was seen in male children <6 years old (8 n). Considering the residence, the majority of cases in Marvdasht (549 n) and Farashband (401 n) were from urban areas, and the difference was statistically significant only in the city of Farashband. In those cities, totally, the highest and lowest number of cases was observed in the autumn and summer, respectively. **Conclusions:** The results showed that the disease trend is increasing in recent years. Advance in socioeconomic conditions and also implementing health education programs for kids, parents, and sick people may help in controlling this disease.

Keywords: Epidemiology, Fars, Iran, pediculosis

Introduction

Sucking lice (Phthiraptera: Anoplura) is found as permanent blood-feeding parasites on approximately 20% of all mammalian species.[1] Lice are small, wingless insects and the three kinds of these ectoparasites that infest humans are head lice, body lice, and pubic lice.[2]

Head lice infestation causes a high level of anxiety among parents of children.[3] It is easily spread by direct contact, particularly in crowded environments.[4] The individuals with head lice infestation are susceptible to secondary bacterial infections.[3,4] Body louse is often found on the persons who are infected by head louse. It can migrate between the different body areas.[5] It causes a severe public health problem as they are vectors of the pathogens *Rickettsia prowazekii* (causing epidemic typhus) *Bartonella quintana* (causing trench fever), and *Borrelia recurrentis* (causing relapsing fever).[6] However, head lice infestation is more common worldwide as a major health problem in poor, developing, and developed countries.[7] Some factors are effective for the head lice prevalence that related to the host such as sex, age group, race, and type of hair.[8] Studies carried out in different parts of the world have reported different prevalence for head lice in children. For example, the rate of infestation has been estimated to be 5.5% in Egypt, 8.9% in Belgium, and 14% in Czech Republic.[9-11] Various reports have been published on the percentage of infestation in Iran.[12-16] Lice is an important public health problem in Iran, same as in other countries in the world. For example, 27% of urban primary schools in Iranshahr area (Southeast of Iran) were found infested; also, the head lice infestation in school children of Tabriz City (Northwest of Iran) was 3.64% and the prevalence of head lice was 1% in Fars province.[17,18] In Khorasan-e-Razavi province, 36.4% infested cases with *Pediculus humanus capitis* and *Pediculus*

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Address for correspondence: Dr. Davood Keshavarzi, Department of Medical Entomology and Vector Control, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: keshavarzd25@gmail.com

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corporis were found in rural and 63.6% in urban areas.[8] In the present study, unlike previous studies that were limited to children, individuals with different age groups were studied.

Actually, the present study was conducted to survey the prevalence of head lice infestation rate in three cities of Fars province in Southwest of Iran in order to complete existing information and previous studies. The information provided in the present paper can help health authorities and researchers for investigating ways to reduce the incidence of disease in cities where the infestation rate is high.

Materials and Methods

This retrospective study was conducted during 4 years (2012–2015) in Lamerd, Farashband, and Marvdasht cities, Fars Provinces, Southern Iran.

Fars Provinces is located in the southern part of Iran (29.62° N, 52.53° E). The following information was obtained for each patient: age, gender, season of admission, and residence enrolled in the study. The diagnosis was established on the basis of clinical and entomological investigations. A case was considered as being infested by the existence of either live or dead lice or nits. The data were analyzed using SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. (Chicago: SPSS Inc.). Differences were considered significant at $P < 0.05$.

Results

In Lamerd, Marvdasht, and Farashband, the total numbers of pediculosis cases were 1675, 954, and 509 cases, respectively. In those three cities, the highest number of cases was found in the year 2015 (1568 n) and lowest was in 2012 (431 n) [Table 1]. This difference was statistically significant ($P < 0.05$). In all cities, the number of females (2921 n) was higher than males (217 n) ($P < 0.05$). The highest prevalence of disease was seen in female children between the ages of 6–12 years (1787 n) while the lowest prevalence was seen in male children < 6 years old (8 n) [Table 1]. Considering the residence, the majority of cases in Marvdasht (549 n) and Farashband (401 n) were from urban areas and the difference was statistically significant only in the city of Farashband. In Lamerd, the number of cases in rural area was slightly higher [Table 1], and this difference was not significant. Totally, the highest and lowest number of cases was observed in the autumn and summer, respectively. In Marvdasht, the infestation was higher in winter (39 n) than autumn (30 n). Tables 2-4 summarize the details of each city.

Discussion

In previous studies in Fars province, the prevalence was reported 0.2% and 0.11% in spring and 0.23% and 0.49% in autumn.[12,13]

In Iran, the disease is more common in cold cities. For example, in a study in Sanandaj City, Kurdistan Province, the total prevalence was 4.7% in children,[14] and in other studies in Hamadan and East Azerbaijan, the prevalence was 6.8% and 4.8%, respectively.[15,16] Therefore, the prevalence is affected by the weather.

The present study shows that the pediculosis was more prevalent in females than males. This report is similar to many previous reports in Iran and other parts of the world.[8,12,19,20] This could be due to that the school girls often formed close groups while talking and playing. Short hair in boys can be another reason because short hair hinder detection of an infestation.[21]

The lice are spread by towels, hats, upholstery, headphones, air movement, and combs. Females can oviposit on a variety of substrates such as denim, human hair, wad, or faux fur. Adult lice are the most mobile than nymph, and they are most likely to initiate new infestations and control measures should emphasis on this stage.[22] Blood-borne factors could affect the ability of lice to increase on some hosts more than others.[23] The frequency of lice infestation in one gender to another is probably more related to social behavior than blood factors.[22]

In accordance with Khokhar,[24] in our study, children in the age group 6–12 years are at the maximum risk for head lice infestation. This could be due to the presence of children in friendly relationships at school. Study on head lice infestation in schoolchildren of Mafraq governorate, Jordan showed a higher infestation rate in younger children (<9 years).[21]

Pediculosis prevalence is affected by a variety of factors such as educational levels of parents, the number of rooms in the house, the number of family members, family income, and health conditions.[21,25] Higher rates of pediculosis were reported in an urban area in Nigeria,[26] as well as the present study for Marvdasht (549 n) and Farashband (401 n) cities. This may be due to the fact that people living in the city have more access to health centers. The higher rates of

Table 1: Total numbers of head lice infestation according to residence, age, and gender in Lamerd, Marvdasht, and Farashband cities-Fars province, Iran

City	Total (*n*)	Residence		Female				Male		
		Rural	Urban	<6	Between 6 and 10	Between 11 and 17	>17	<6	Between 11 and 17	>17
Lamerd	1675	865	810	35	1021	396	17	8	136	62
Marvdasht	954	405	549	53	447	249	198	0	7	0
Farashband	509	108	401	32	319	108	46	0	4	0
Total	3138	1378	1760	120	1787	753	261	8	147	62

Table 2: Head lice among individuals according to residence, age, and gender in different seasons, Lamerd city-Fars province, Iran

Year	Total (*n*)	Residence		Age group (year)						
				Female				Male		
		Rural	Urban	<6	Between 6 and 10	Between 11 and 17	>17	<6	Between 11 and 17	>17
2012	220	99	121	7	126	58	5	2	16	6
Spring	32	10	22	5	9	8	4	1	3	0
Summer	0	0	0	0	0	2	0	0	0	0
Autumn	105	44	61	0	84	21	0	0	0	0
Winter	83	45	38	2	33	27	1	1	13	6
2013	294	196	98	5	183	80	2	1	21	2
Spring	26	21	5	5	10	3	2	1	5	0
Summer	0	0	0	0	0	0	0	0	0	0
Autumn	239	160	79	0	155	69	0	0	15	0
Winter	29	15	14	0	18	8	0	0	1	2
2014	277	171	106	12	160	84	7	2	9	3
Spring	10	9	1	0	9	0	0	0	1	0
Summer	20	11	9	2	9	4	1	0	3	0
Autumn	124	88	36	7	78	33	3	1	3	2
Winter	123	63	60	3	64	47	3	1	2	1
2015	884	399	485	11	552	174	3	3	90	51
Spring	70	50	20	0	47	16	0	0	6	1
Summer	69	25	44	11	24	9	3	3	13	6
Autumn	566	250	316	0	373	125	0	0	46	22
Winter	179	74	105	0	108	24	0	0	25	22

Table 3: Head lice among individuals according to residence, age, and gender in different seasons, Marvdasht city-Fars province, Iran

Year	Total (*n*)	Residence		Age group (year)						
				Female				Male		
		Rural	Urban	<6	Between 6 and 10	Between 11 and 17	>17	<6	Between 11 and 17	>17
2012	120	95	25	4	91	16	5	0	4	0
Spring	35	29	6	2	18	7	4	0	4	0
Summer	16	16	0	1	14	0	1	0	0	0
Autumn	30	25	5	1	27	2	0	0	0	0
Winter	39	25	14	0	32	7	0	0	0	0
2013	124	59	65	3	66	25	28	0	2	0
Spring	9	7	3	1	4	2	0	0	1	0
Summer	25	12	7	2	5	5	2	0	1	0
Autumn	59	26	39	0	46	8	26	0	0	0
Winter	31	14	16	0	11	10	0	0	0	0
2014	210	35	175	22	70	95	22	0	1	0
Spring	7	4	3	0	4	3	0	0	0	0
Summer	5	5	0	2	0	1	2	0	0	0
Autumn	125	13	112	0	50	74	0	0	1	0
Winter	73	13	60	20	16	17	20	0	0	0
2015	500	216	284	24	220	113	143	0	0	0
Spring	74	45	29	4	30	20	20	0	0	0
Summer	40	19	21	5	15	15	5	0	0	0
Autumn	279	98	181	7	144	43	85	0	0	0
Winter	107	54	53	8	31	35	33	0	0	0

head lice infestation in Poland and Turkey were reported in rural areas.[19,25] In the present study, the number of cases in rural areas was higher than urban areas for Lamerd city. Consideration of control and prevention methods in the above

Table 4: Head lice among individuals according to residence, age, and gender in different seasons, Farashband city-Fars province, Iran

Year	Total (*n*)	Residence		Age group (year)						
				Female				Male		
		Rural	Urban	<6	Between 6 and 10	Between 11 and 17	>17	<6	Between 11 and 17	>17
2012	91	7	84	0	29	43	19	0	0	0
Spring	13	2	11	0	5	6	2	0	0	0
Summer	3	0	3	0	3	0	0	0	0	0
Autumn	26	3	23	0	3	23	0	0	0	0
Winter	49	2	47	0	18	14	17	0	0	0
2013	94	27	67	3	66	18	5	0	2	0
Spring	9	5	4	0	7	2	0	0	0	0
Summer	5	4	1	0	4	1	0	0	0	0
Autumn	67	15	52	2	48	13	3	0	1	0
Winter	13	3	10	1	7	2	2	0	1	0
2014	140	13	127	16	93	14	16	0	1	0
Spring	17	3	14	2	11	2	2	0	0	0
Summer	6	0	6	4	1	0	1	0	0	0
Autumn	66	9	57	5	49	2	9	0	1	0
Winter	51	1	50	5	32	10	4	0	0	0
2015	184	61	123	13	131	33	6	0	1	0
Spring	25	1	22	6	14	3	2	0	0	0
Summer	28	3	26	7	15	2	4	0	0	0
Autumn	92	51	42	0	75	16	0	0	1	0
Winter	39	6	33	0	27	12	0	0	0	0

counties is essential. Louse prevention and control methods could include use of a louse comb, because it is more effective than visual inspection for removal, examine all other family members and friends within an infested person's immediate circle of contact, laundering of infested clothes and bedding using the hot water or isolating of such items for ≥ 18 days, and thorough cleaning of car seats, carpets, and upholstered furniture with a standard vacuum cleaner.[22]

Conclusions

Our study exposed that female children between the ages of 6–12 years are more vulnerable to head lice infestation, and the prevalence of pediculosis is high in both urban and rural areas. The disease trend is increasing in recent years. Hence, improvements in socioeconomic conditions and also implementing health education programs for students' parents and teachers may help in controlling this disease.

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Conflicts of interest

There are no conflicts of interest.

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