Original Article

Epidemiology of Head Lice Infestation in Primary School Pupils, in Khajeh City, East Azerbaijan Province, Iran

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(Received 19 Dec 2009; accepted 7 Apr 2010)

Abstract

Background: Pediculus capitis (Anoplura: Pediculidae) or head louse is an obligate ectoparasite transmitted mainly through physical contact. This study was conducted to survey the prevalence of head lice infestation rate and some risk factors in Primary School pupils, in Khajeh City East Azerbaijan Province, Iran

Methods: We selected 20 primary schools of Khajeh City during 2008 and 2009. Totally 500 pupils including 200 boys and 300 girls from all grade 1-5 were selected by multistage, systematic random sampling in rural areas of Khajeh City and were examined for lice. In addition, a standard questionnaire recorded information about demographic features of each pupil. Results were analyzed by SPSS software.

Results: The total prevalence of head lice infestation in this study was 4.8%, and the prevalence rate was significantly higher in girls (6.66%) than in boys (2%). Epidemiological factors such as: sex, school grade, family size, parent's education, type of house, hair washing (per week), number of using comb per day, were evaluated and results showed significant difference in head lice infestation and sex, school grade, family size, father education, and type of house (P< 0.05).

Conclusion: Pediculosis is a public health problem in many parts of the world, and due to the higher prevalence of pediculosis in crowded families, family by lower levels of father's education and socioeconomic status in our study and rural area, it is necessary to give health education for families to prevent of pediculosis in this area.

Keywords: Head louse, Pediculus capitis, Epidemiology, Iran

Introduction

Pediculus capitis (De Geer, 1778) (Anoplura: Pediculidae) or head louse is an obligate ectoparasite transmitted mainly through physical contact (Linardi et al. 1988). Because of head louse feeding of blood it leads to anemia and in the scratch sites can lead to secondary infection (Slonka et al. 1976). Head louse is one of the health problems in many parts of the world (Ewasechko 1981, Kwaku-Kpikpi 1982). Head louse prevalence in school-age children is more common for example, 27% of urban primary schools in Iranshahr area (Southeast of Iran) were found infested (Alempour Salemi et al. 2003). Hodjati et al studied the head lice infestation in school children of Tabriz City and the infestation rate was 3.64% (Hodjati et al. 2008). The prevalence of head lice was 1% in Fars (Davarpahan et al. 2009), and 1.3% in Bahar (Moradi et al. 2009).

Some factors are effective for the head lice prevalence, that related to the host such
as: sex, age group, race, type of hair and in recently years resistance to insecticides have contributed to the increase of head lice prevalence (Nazari et al. 2006).

This study was conducted to survey the prevalence of head lice infestation rate and some risk factors in primary school pupils, in Khajeh City, East Azerbaijan Province, Iran.

Materials and Methods

This Primary school-based, cross-sectional study was conducted at 20 primary schools of Khajeh City (Haris township, East Azerbaijan Province, Iran) during 2008 and 2009. Totally 500 pupils including 200 boys and 300 girls from all grade 1-5 were selected by multistage, systematic random sampling in rural areas of the Khajeh City then were examined for the presence of one of life stages of lice, including eggs and nymph or adult.

A team including health workers of study area, school health nurses and a medical entomologist, skilled in the detection of head lice examined the pupils’ hair and scalps for lice. Screening was carried by visual inspection of the head and scalp under the light of a reading lamp about 3-5 min. Pupils suspected of having lice were subjected to comb with a fine-toothed comb for about 7 minutes over a white paper of 60×75 cm size. The removed lice were observed, collected by sellotape. Pupils, whose hair had at least one of the developing stages of parasite including only nits located ¼ inch from the scalp were considered positive (Alempour Salemi et al. 2003).

Also we used a standard questionnaire to record information about sex, school grade, family size, parent's education, type of house (muddy, woody, brick built), hair washing (per week), availability to safe water and number of lice recovered.

The chi-square test (SPSS software, version 11.5) was used to compare categorical variables. For all statistical analyses, a significance level of $P< 0.05$ was adopted.

Results

The total prevalence of head lice infestation was 4.8%. The difference between lice prevalence was significant regarding the gender, which was higher in girls (6.66%) than in boys (2%) ($P< 0.05$) (Table 1). Table 2 shows the prevalence of head lice infestation in primary school pupils, which was stratified by social factors. The prevalence of head lice infestation by frequency of hair washing was 8.66%, and 3.7%, for once in two week, once a week respectively and twice or more a week had not any lice. The difference between twice or more of hair washing in a week and infestation rate was highly significant ($P< 0.05$) in comparison to once in two week and once in a week. All of the head lice infestations were in family, which had more than 3 members. The prevalence of head lice infestation was significantly according to school grade ($P< 0.05$). The most frequent group was first grade (13.54%) (Table 2). The prevalence of head lice in relation to type of house was statistically significant ($P< 0.005$) and in muddy house was 10.1%, woody house 5.73 and the pupils who lived in brick built homes had not any infestation (Table 2).

The results of this survey showed that infestation rate in the pupils who did not use of comb were 6.81%, once use in day 5.94%, and twice use were 2.85%. There was no statistical difference found between the number use of comb and infestation rate. The prevalence of head lice infestation by parents' literacy is presented in Table 3. This results show that there was a negative correlation between father’s education and infestation rate ($P< 0.05$). There was not any significant difference between mother's education and infestation.
Table 1. Prevalence of the head lice infestation in primary School pupils by sex in Khajeh, Iran

| Sex       | No. of Examination | No. of infestations | Prevalence (%) |
|-----------|--------------------|---------------------|----------------|
| Male      | 200                | 4                   | 2              |
| Female    | 300                | 20                  | 6.66           |
| Total     | 500                | 24                  | 4.8            |

Table 2. Prevalence of the head lice infestation in primary school pupils by social factors in Khajeh, Iran

| Characteristics          | No. of Examination | No. of infestations | Prevalence (%) |
|--------------------------|--------------------|---------------------|----------------|
| Frequency of hair washing|                    |                     |                |
| Once two week            | 150                | 13                  | 8.66           |
| Once a week              | 297                | 11                  | 3.7            |
| twice or more a week     | 36                 | 0                   | 0              |
| Family size              |                    |                     |                |
| ≤3                       | 20                 | 0                   | 0              |
| >3                       | 480                | 24                  | 5              |
| Type of House            |                    |                     |                |
| Muddy                    | 99                 | 10                  | 10.1           |
| Woody                    | 244                | 14                  | 5.73           |
| Brick built              | 157                | 0                   | 0              |
| School grade             |                    |                     |                |
| I                        | 96                 | 13                  | 13.54          |
| II                       | 113                | 5                   | 4.42           |
| III                      | 105                | 3                   | 2.85           |
| IV                       | 87                 | 2                   | 2.29           |
| V                        | 99                 | 1                   | 1.01           |
| Number use of comb in day|                    |                     |                |
| Not use                  | 88                 | 6                   | 6.81           |
| Once a day               | 202                | 12                  | 5.94           |
| Twice a day              | 210                | 6                   | 2.85           |

Table 3. Prevalance of the head lice infestation in primary school pupils according to parents' literacy in Khajeh, Iran

| Characteristics          | No. of Examination | No. of infestations | Prevalence (%) |
|--------------------------|--------------------|---------------------|----------------|
| Father's education       |                    |                     |                |
| Uneducated               | 65                 | 8                   | 12.3           |
| Primary                  | 313                | 14                  | 4.47           |
| guidance school          | 115                | 2                   | 1.73           |
| High school and upper    | 7                  | 0                   | 0              |
| Mother's education       |                    |                     |                |
| Uneducated               | 364                | 22                  | 6.04           |
| Primary                  | 104                | 2                   | 1.92           |
| guidance school          | 31                 | 0                   | 0              |
| High school and upper    | 1                  | 0                   | 0              |
Discussion

The total prevalence of head lice infestation among primary school pupils was 4.8%. The prevalence rate from different parts of Iran, mostly in primary school pupils reported lower 1% in Fars (Davarpanah et al. 2009), 1.3% in Hamedan (Moradi et al. 2009), 3.64% in Tabriz (Hodjati et al. 2008), 3.8% in Kerman (Kamiabi et al. 2005), 27% in Iranshahr (Alempour Salemi et al. 2003) and 28.5% in Ardabil (Edalatkhah et al. 2005). Also infestation rate among school pupils in some parts of the world was 33% in Australia (Speare et al. 1991), 35% in Brazil (Borges et al. 2002), 48.7% in France (Courtaiaide et al. 1993) and 49.7% in Ghana (Kwaku 1982). Almost in all this studies in Iran and other parts of the world, the prevalence of head lice infestation in female pupils was more than the prevalence of the infestation in male pupils. Difference in behavior patterns between boys and girls might have affected transmission rates and susceptibility to head lice infestation (Moradi et al. 2009). We found that P. capitis was more prevalent in crowded families, muddy house, family by lower levels of father's education and socioeconomic status, little frequency of hair washing in a week which are all associated with pediculosis (Akisu et al. 2003, Balcioglu et al. 2007) are more frequent in rural regions. Because this study was conducted in rural parts of Khajeh City, these results were expected. We also surveyed the prevalence of head lice infestation by school grade and found that the prevalence in first grade was significantly frequent ($P<0.05$). Edalatkhah et al in Ardabil reported that infestation rate in younger group was more than older group, and this was similar to our study (Edalatkhah et al. 2005).

In conclusion, it seems that it is necessary to render health education for families in order to prevent pediculosis in the field. In addition, health professionals should be responsible for treatment and prevention of louse infestation.

Acknowledgements

The authors would like to appreciate very much for kind collaboration of all staff of primary schools of Khajeh City. The study was conducted based of the self-funded design. The authors declare that they have no conflicts of interest.

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