Pakistan Entomologist

Journal homepage: www.pakentomol.com

PREVALENCE OF SOME MEDICAL INSECTS AND ARACHNIDS (LICE AND SCABIES) DEPENDING ON RECORDS FROM THE MINISTRY OF HEALTH IN KURDISTAN REGION, IRAQ

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ARTICLE INFORMATION

Received: November 7, 2013
Received in revised form: December 12, 2013
Accepted: December 18, 2013

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ABSTRACT

Health records from three governorates (Erbil, Sulaymaniyah and Dohuk) in Kurdistan region-Iraq were used to obtain the required data for pediculosis and scabies during 2009 from 86076 patients in which a total 5995 (6.9%) and 9828 (11.4%) patients were infected with pediculosis and scabies, respectively. The overall prevalence with pediculosis and scabies in Erbil, Sulaymaniyah and Dohuk governorates were 14.3% and 14.7, 2.0% and 2.1% and 1.5% and 20.9%, respectively. The infestation with *Pediculus humanus capitis* and *Sarcoptes scabies* showed monthly fluctuations. In Erbil governorate, the ectoparasite *P. humanus* infestation appeared in most months of the year and ranged between 9.0% to 16.9% during May and December, respectively, while the rates of infestation with the *S. scabies* ranged between16.4% to 11.3% during March and April, respectively.

Keywords: Iraq, Kurdistan region, Prevalence, *Pediculus humanus capitis*, *Sarcoptes scabies*

INTRODUCTION

Pediculosis and scabies are common parasitic skin disease, ubiquitous, contagious and debilitating parasitic dermatoses, especially in poor populations throughout the world and are associated with considerable morbidity. Pediculosis is a very common infestation. The prevalence of head lice differs from country to country and depends on the diagnostic criteria and methods used (Vander *et al.*, 2002; Willems *et al.*, 2005). Pediculosis is caused by *Pediculus humanis capitis*, the human head louse. *P. humanus capitis* belongs to the order Phthiraptera, sub-order Anoplura or sucking lice. Head lice are usually found on the scalp, the back of neck and post auricular areas. The adult head lice are about 3 mm long; males are slightly smaller than females. They are dorsoventrally flattened insect with six legs. The legs end in a claw which is specially adapted to grasp a hair. Lice have no wings and cannot fly or jump (Burgess, 2004). Adult lice crawl at a speed of approximately 12 cm/min. Younger stages are slower with first instars crawling at a speed of 6 cm/min (Takano-Lee *et al.*, 2005). Lice are host specific, meaning that human lice can only live and reproduce on humans (Ibarra, 1993; Ellis *et al.*, 2004). There is a lot of controversy in the scientific literature on the transmission of head lice. It is generally agreed on that head-to-head contact is a definite mode of transmission but there is no consensus on the intensity or frequency of the contact needed for transmission. Opinions also differ on the importance of the transmission via inanimate objects, so called fomites (Chunge *et al.*, 1991; Burkhart, 2003; Ko and Elston, 2004). Scabies is not a life threatening condition but nevertheless it is a nuisance for the affected individual because of the rash and the intense and persistent pruritus that can be depressing and severely debilitating (Green, 1989). However, scabies has a large impact on public health. It is estimated that 300 million new cases of scabies occur worldwide every year (Chosidow, 2006). Scabies is endemic in many resource poor communities. Since ancient times, it has been known that scabies is caused by a tiny organism (Orkin and Maibach, 1985). It is said that scabies is the first disease for which a cause was found (Walton *et al.*, 2004). The human scab mite, *Sarcoptes scabiei* var. *hominis*, is an obligate parasite of human skin (Burkhart *et al.*, 2000). Female mites are about 400 µm long and 300 µm wide and are twice the size of males. On microscopic examination, the mouth parts and four pairs of legs are usually distinguishable. Scabies mites are very host

Cite this article as: Ali, W.K., Q.M.K. Koyee, R.K. Ahmed and S.M.A. Abdullah, 2013. Prevalence of some medical insects and arachnids (lice and scabies) depending on records from the ministry of health in Kurdistan region, Iraq. Pak. Entomol., 35(2): 89-93.

specific, meaning that they do not readily infest other hosts. However, cross-infestations are possible but do not frequently occur and are probably self-limiting (Arlian, 1989).

The female mite digs burrows in the stratum corneum and granulosum of the epidermis (Burkhart *et al.*, 2000). In these burrows the female lays 2 to 3 eggs per day which need 2 to 3 days to hatch (Meinking, 1999; Walton *et al.*, 2004).The larva, burrows and moults passing through a 6 legged nymphal stage before becoming adult (Meinking, 1999; Chouela *et al.*, 2002). It takes 10 to 14 days for an egg to develop into an adult stage. The mites feed on the lymph and lysed tissue of their host (Arlian, 1989). The survival of scabies mites off the host is limited. During an *in-vitro* experiment at room temperature, mites were found to survive 24 to 36 hours off the host while keeping their infestive capacity to re-establish on a host (Arlian *et al.*, 1984). It is generally accepted that close physical contact is a common mode of transmission (Meinking, 1999; Burkhart *et al.*, 2000; Chouela *et al.*, 2002).There is, however, much controversy over the role of fomites, inanimate objects temporarily carrying mites in the transmission of scabies. Some experts believe that transmission through fomites could even be more important than physical contact, while others believe that this mode is of minor importance (Orkin and Maibach, 1985).

It cannot be denied that living and infestive mites capable of re-infestation can be present on objects that are in close contact with a scabies patient (Arlian *et al.*, 1988).The aim of the study was to identify the epidemic state of pediculosis and scabies in Kurdistan Region, Iraq.

MATERIALS AND METHODS

Health records from the Ministry of Health in Kurdistan region of the selected governorates (Erbil, Sulaymaniyah and Dohuk) of Iraq were used to obtain the required data for pediculosis and scabies during 2009 from 86076 patients for detection of any possible infestations.

RESULTS AND DISCUSSION

A total 5995 (6.9%) and 9828 (11.4%) of 86076 examined patients were infected with pediculosis and scabies, respectively in the year 2009 in Kurdistan region governorates (Erbil , Sulaymaniyah and Dohuk). The overall prevalence with pediculosis and scabies in Erbil, Sulaymaniyah and Dohuk governorates were14.3% and 14.7%), 2.0% and 2.1% and 1.5% and 20.9%, respectively (Table 1).

Variability was noted in the prevalence of pediculosis and scabies along the months of the study. The infestation with *Pediculus humanus capitis* and *Sarcoptes scabies* showed monthly fluctuations. The infestation of former ectoparasite appeared in most months of the year with minimum infestation (9.0%) during May and maximum (16.9%) during December. The lower rates of infestation with the later ectoparasite was reported in April (11.3%) and the higher rate of infestation was 16.4% in March (Table 2). The ectoparasites recorded in Erbil governorate, were also found in Sulaimaniya governorate exhibiting their prevalence comparable to some extent (Table 3). The highest infestations rate with pediculosis and scabies were 5.9% in October and 3.5% in December, respectively; while there was no record of positive cases in April for both ectoparasites.

In Dohuk governorate, the infestation rate with scabies was very high (43.8%) during August in comparison with its rate in the other mentioned governorates (Erbil and Sulaimaniya), whereas the highest rate of infestation with pediculosis was 6.9% in March. No positive cases were reported in February for both ectoparasites (Table 4).

Numerous reports on the epidemiology of pediculosis have been published. These reports generally describe local prevalence rates of pediculosis in school children. These data are nevertheless important to detect seasonal trends or the influence of community hygiene conditions of three different governorates in Kurdistan Region. In Erbil governorate, the prevalence of pediculosis was 9.1% during 2005 (Ali, 2005), which is more than that documented by school health service of Erbil (5.8%) (W.H.O., 2005). This may be due to under diagnosis by untrained paramedical staff. The lower infestation rates in Mosul during 1994 (16.6-28.0%) (Al-Khaffaf, 1994) may be due to the bad effects of embargo in Iraq on all the aspects of life including health status. While the prevalence in Ninevah during 2002 was 1.52% among the children aged 5-14 years (Abdul-Majeed, 2002), which is much less than that recorded in present study. This may be due to the time factors during examinations of the children and also the study is not specific for this age group and the school. Rate of infestation documented by Ali (2005) was higher than that recorded by Al-khafagi (1989) in Baghdad within children aged 0-15 years (5.6%). The reason of this variation may be attributed to the fact that the disease is uncommon in children of less than 4 years age which is included in his study. This rate is near to the rate in Amman, Jordan 11.0% (Shakkoury and Abu-Wandy, 1999) and in Turkey 9.4% (Inanir *et al.*, 2005). A rate of infestation by Ali (2005) was lower than that reported in the following studies (Suleman and Jabeen, 1989; Valia and Pandey, 1991; Abdel-Hafez *et al.*, 2003; Heukelbach *et al.*, 2005). This reflects the effects of low socio-economic status on the distribution of the disease, in spite of the facts that the disease still is common in some

Table 1
Prevalence of lice and scabies in governorates of Kurdistan region during 2009.

Location	Number of specimens examined	Number of specimens infected with lice (%)	Number of specimens infected with scabies (%)
Erbil governorate	35555	5078 (14.3)	5213 (14.7)
Sulaymaniyah governorate	31726	639 (2.0)	679 (2.1)
Dohuk governorate	18795	278 (1.5)	3936 (20.9)
Total	86076	5995 (6.9)	9828 (11.4)

Table 2
Seasonal prevalence of lice and scabies in Erbil governorate during 2009.

Months	Number of specimens examined	Number (%) of specimens infected	
		Lice	Scabies
January	2667	410 (15.4)	400 (14.9)
February	2865	341 (11.9)	361 (12.6)
March	1932	259 (13.4)	317 (16.4)
April	3244	384 (11.8)	367 (11.3)
May	2980	469 (9.0)	395 (13,6)
June	3798	477 (12.6)	632 (15.6)
July	3578	544 (15.2)	550 (15.6)
August	3317	527 (15.9)	524 (15.8)
September	2323	354 (15.2)	355 (15.3)
October	3359	462 (13.7)	517 (15.4)
November	3114	349 (11.2)	425 (13.6)
December	2378	402 (16.9)	370 (15.6)
Total	35555	5078 (14.3)	5213 (14.7)

Table 3
Seasonal prevalence of lice and scabies in Sulaimaniya governorate during 2009.

Months	Number of specimens examined	Number (%) of specimens infected	
		Lice	Scabies
January	3168	46 (1.5)	81 (2.6)
February	3525	60 (1.7)	55 (1.6)
March	1937	32 (1.7)	55 (2.8)
April	1770	0 (0.0)	0 (0.0)
May	3990	79 (1.9)	39 (0.9)
June	2791	40 (1.4)	73 (2.6)
July	3083	19 (0.6)	42 (1.4)
August	1697	9 (0.5)	10 (0.1)
September	1376	23 (1.8)	48 (3.5)
October	2114	124 (5.9)	72 (3.4)
November	3680	153 (4.2)	113 (3.1)
December	2595	44 (1.7)	91 (3.5)
Total	31726	639 (2.0)	679 (2.1)

Table 4
Seasonal prevalence of lice and scabies in Duhok governorate during 2009.

Months	Number of specimens examined	Number (%) of specimens infected	
		Lice	Scabies
January	1231	47 (3.8)	427 (34.7)
February	702	0 (0.0)	0 (0.0)
March	969	67 (6.9)	293 (30.2)
April	1058	24 (2.3)	64 (6.0)
May	1927	28 (1.5)	661 (34.3)
June	2466	50 (2.0)	633 (25.7)
July	2037	9 (0.4)	142 (6. 9)
August	1040	5 (0.5)	456 (43.8)
September	1589	7 (0.4)	329 (20.7)
October	2230	25 (1.1)	463 (20.8)
November	2058	18 (0.9)	453 (22.0)
December	1488	45 (3.0)	442 (29.8)
Total	18795	278 (1.4)	3936 (20.9)

developed countries as a study done in UK showed that one in five children are affected in same schools (Downs *et al.*, 1999). In addition to that, no recent published prevalence data is available from developed countries. Ali (2005) reported that *Pediculus capitis* started to increase from 6.7% in the month of academic year (September) to 10.0% in October and to 14.8% in November then declined in the following months. The reason of this fluctuation can be explained that the children with already infestation of the disease transmit the disease to non-infested pupils through direct contact or uncommonly through the articles and act as a source of infection to start a chain of transmission in the school and to their relatives in their family. and the decline in the prevalence from the December and the following months is a result of a campaign of mass therapy of the infested pupils by pediculocide shampoos through the school health service, whereas the re-rising of rate after February month is due to the absence of follow up. It is a common event in more than a country that when the schools back, the head lice back. This in noted by the National Pediculosis Association (NPA) and September was established as the national pediculosis prevention month in 1985 (Richard, 2003). In a study done by Ahmed (2006) reported that 185 (10.2%) of 1809 examined children were infested in Erbil city. In a study done in Mosul by Saed (1998) reported that 22.3% of different school pupils were infested with pediculosis from the total 1155 examined children. Mustafa (2004) reported 382 out of 682 prisoners (56%) were infested in Erbil city with head lice and the high incidence among prisoners was observed during cold months as compared to hot months, while 346 (50.7%) of them were infested with Scabies. There is little information on the incidence of scabies because only a few countries have a systematic nationwide reporting system (Green, 1989; Lonc and Okulewicz, 2000; Kansky *et al.*, 2000). The incidence of scabies shows a variation over time in different governorates. Some hypothesis shows that some populations act as reservoirs. Fluctuations in the incidence can be caused by population movements such as war or massive tourism (Downs *et al.*, 1999). Most surveys indicate a seasonal variation with higher incidences during autumn and winter than in spring and summer(Tuzun *et al.*, 1980; Pannell *et al.*, 2005). It is hypothesized that conditions for survival away from the host are more favorable in winter than in summer. Mites survive longer in cold and humid environments that particularly occur in winter (Downs *et al.*, 1999; Buczek *et al.*, 2005). It has been postulated that cold weather encourages crowding, leading to more favorable circumstances for transmission (Pannell *et al.*, 2005). There has been little research on the influence of socio-economic factors on the incidence of scabies. One study indicated that a greater rate of infestations in rural areas was caused by the lower socio-economic profile of this population. A hampered access to medical services was also suggested as a contributing factor (Buczek *et al.*, 2005).There is no clear distribution of scabies according to sex or age. In Denmark, a higher incidence was observed in girls than in boys from birth up to puberty. The difference disappeared from early adulthood on (Christophersen, 1978). In a survey from Tunisia and UK. a higher incidence was found in females (Mebazaa *et al.*, 2003; Pannell *et al.*, 2005). In the Polish survey, more females than males were affected but the difference was not statistical significant (Buczek *et al.*, 2005). No sex difference was found in an endemic area in Brazil (Buczek *et al.*, 2005). It is not possible to make a definite conclusion on a possible sex difference based on the available literature. A complex analysis of accurate data, taking multiple risk factors into account, is needed but is hard to achieve. In most reports, scabies is most common in children and young adults and less frequent in the elderly (Tuzun *et al.*, 1980; Buczek *et al.*, 2005). However, one recent report indicated a higher incidence in persons over 75 years, which might indicate a spread of scabies in institutions (Pannell *et al.*, 2005). The global incidence of scabies in 2004 in Ghent was 28 per 100.000 inhabitants per year and was the same in men and women. The incidence was almost 4 times higher in immigrants than in persons with a Belgian nationality. The highest incidence rates were found in children under 4 years of age (50 per 100.000), in young adults between 15 and 24 tears of age (35 per 100.000) and in the elderly over 75 years of age (51 per 100.000 in persons).

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