

Case Report

Human Infestation with *Dermanyssus gallinae* (Acari: Dermanyssidae) in a Family Referred with Pruritus and Skin Lesions

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Abstract

The poultry red mite, *Dermanyssus gallinae* is one of the most economically important ectoparasites in hens and some species of mammals worldwide. Cases of human infestation have been reported worldwide. In this study we report infestation in three members of a family referred with pruritus and allergic dermatitis rash. They have collected very small animals and carried them to the laboratory which later was confirmed as *D. gallinae*. They claimed that they had been bitten with this ectoparasite. This is the first case report of human infestation owing to *D. gallinae* from Iran.

Keywords: *Dermanyssus gallinae*, Infestation, Human

Introduction

The poultry red mite, *Dermanyssus gallinae* is one of the most economically deleterious ectoparasite of laying hens and sometimes in broiler birds worldwide. Recent surveys and sample collection from Norway have confirmed the enzootic nature of *D. gallinae* in poultry farming worldwide (Sparagano et al. 2009). The parasite infestation already existed in the farm. *Dermanyssus* mites are blood feeders and are responsible for anemia and welfare problems in birds, dermatitis in humans and egg downgrading as well as blood spotting which imply a huge economic, welfare, epizootic and epidemiological problems for birds and human populations.

On average the *Dermanyssus* infestation rate was between 60% and 65% for cage, free-range and organic systems while it was around 54% for barn production systems (Sparagano et al. 2009). *Dermanyssus gallinae* can also feed on some species of mammals, including humans, causing dermatitis and skin lesions. Ectoparasitic diseases have been re-

ported in travelers returning from both developed and developing nations. Ectoparasitic diseases afflict the skin and its appendages and orifices, especially the scalp, facial, and pubic hairs, external ears, nares, orbits and eyelids, and genitourinary and rectal orifices. The red chicken mite can also cause pruritic dermatitis usually on the back of the hands and forearms in poultry workers and can transmit both St. Louis encephalitis and western equine encephalitis (James et al. 2006).

Case Report

Three members of a family referred to Parasitology Department of Razi Institute complaining pruritus, reported itching all over their body with intensified itching of hands, forearms, back of neck, and chest intensifying particularly at evening hours.

In physical examination common findings of usual pruritus dermatitis such as erythematous maculopapular rash covered with bloody

crust due to violent itching have been noted (Fig. 1, 2).

Other than above mentioned signs of infestation, they physically appeared normal and no other medical examinations or tests were done.

Their medical history and records showed no chronic condition. The specimens were identified through microscopic examination in the Parasitology Department of Razi Ins. as *D. gallinae* (Fig. 3, 4). *D. gallinae* is characterized by long styliform chelicerae, tibia II–IV with one seta and was discriminated from a near member (*Ornithonyssus silviarum*) (Di-Palma et al. 2012).

The family members were informed of the findings and control measures to protect themselves from additional infestations and to protect relation of birds or birds' nests was emphasized.



Fig. 1. Skin rashes over forearm of (mother) due to infestation by *Dermanyssus gallinae* (Original)



Fig. 2. Erythematous maculopapular rash were covered with bloody crust due to violent itching on the back of neck (Son), due to infestation by *Dermanyssus gallinae* (Original)



Fig. 3. *Dermanyssus gallinae* (female) Characterized by long styliform chelicerae (arrow, very thin elements) (Original)



Fig. 4. *Dermanyssus gallinae* (female) Characterized by long styliform chelicerae (arrow, very thin elements) (genitoventral shield), (Anal shield) and mesostigmatal pore between coxa 3 and coxa 4 (Original)

Discussion

Three members of a family referred to Parasitology Department of Razi Institute due to suffering from pruritus dermatitis. They carried few samples of ectoparasites with themselves. On the basis on medical and physical examination, history of medical illness, parasitological studies on the samples, form of skin rashes and rolling out of other differential diagnosis such as pediculosis and scabies, *D. gallinae* infestation was confirmed. All family members were infested.

This co-infestation has been reported by other studies. For example Akdemir et al. showed that similar signs had been seen in all members of the infested household (Akdemir 2009).

The referred cases had skin rashes over

forearm (mother), chest and back of neck (son). Erythematous maculopapular rash was covered with bloody crust due to violent itching specially in forearm of mother. Other studies have showed that *D. gallinae* infestations afflict the skin (causing intensified itching of body (Akdemir 2009) and finally pruritic dermatitis usually on the backs of the hands and forearms (Neva et al. 1994). Scalp (causing scalp pruritus), face, pubic hairs, external ears (causing otitis externa (Rossiter 1997), nares, orbits and eyelids, and genitourinary and rectal orifices (James et al. 2006).

Dermanyssus gallinae was first identified by De Geer in 1778, and first report of human infestation was reported by Willian in 1809. In 1828, Saint-Vincent spotted this parasite on the skin of a human, but first observation of its feeding on human blood was published by Williams in 1958. Now it seems that human *D. gallinae* is a worldwide infestation. Cases of human *D. gallinae* infestation have been reported from Denmark, France, Japan, Montenegro, Morocco, Norway, Serbia, the Netherlands, UK, Egypt, Turkey etc. (Dogramaci et al. 2010). This is the first reported case of *D. gallinae* infestation from human in Iran.

These cases are of significance because most dermatologists have difficulty identifying ectoparasitosis, such as those that arise within new or atypical conditions. These cases may be misdiagnosed with other pruritus and treated with antihistamines and topical corticosteroids with temporary relief of the symptoms for long time (Dogramaci et al. 2010).

D. gallinae has role as vectors for some bacteria such as *Salmonella*, *Spirocheta*, *Rickettsia*, *Pasteurella* besides being ectoparasitic activities (Vaiente et al. 2007).

Otitis externa is only occasionally occurred occupational in origin and infestations of the ear are even less common. Two cases of occupational otitis externa due to infestation with *D. gallinae*, the red poultry mite, are

reported occurring in poultry workers (Rossiter 1997).

Although a marked clinical dermatitis is common in some individuals that become closely associated with the bird mite, *D. gallinae*, the literature presents little evidence that this mite will ingest human blood and many investigators think this species will never ingest it. The invasion of a New York (Williams 1958) City apartment by these mites resulting in attacks on the occupants was described in a famous study. The finding of mammalian erythrocytes in the digestive tract of mites collected from that apartment (Williams 1958), some of which were taken from the bed of the occupants, as well as the appearance of fresh blood splotches on the bed sheets resulting from crushed mites which had recently fed, offer some factual evidence that *D. gallinae* may, on occasion at least, partake of human blood. An older research article (Williams 1958), had clearly documented human blood was ingested by *D. Gallinae*, which was contrary to what many had previously thought, the bird mites do not feed on humans, but only on birds.

Cutaneous manifestations of avian mite bites are not well recognized by physicians or patients. Clinical signs and symptoms are usually caused by bites from avian mites that have infested domestic poultry or birds nesting in or near human habitation. Pruritic dermatitis visible with papules and vesicles which sometimes is mistaken for scabies or pediculosis may be chronic or recurrent with erythematous maculopapular or papulovesicular lesions (Personal communication). In the present case physical examination common findings of usual pruritus dermatitis such as erythematous maculopapular rash covered with bloody crust due to violent itching have been noted.

Treatment of bird mite infestation consists of removing the old nests. Treatment of

the patients is symptomatic. Epizoonosis belongs in the differential diagnosis of pruritus, infestation with bird or chicken mites is one of the possibilities (Prins et al. 1996).

Human costs are difficult to establish but cases of dermatitis related to *D. gallinae* are now more and more obvious while workers in some countries had to be paid 3 times more in recent years to work with *D. gallinae* infested birds (Sahibi et al. 2008).

Keeping pigeons, love birds and other birds is common in Iran. Besides, the poultry sector in Iran is much expanded and still developing. An important part of hens is still kept by small holders, so, it seems that many people may expose to poultry ectoparasites like *D. gallinae*. More studies on epidemiology of this ectoparasite in different exposed groups are suggested.

Pruritic dermatitis cases would be more frequent than the reports made to medical centers as in this case, and cutaneous reactions resulting from avian mites are generally gone unnoticed. It may be necessary to collect a detailed surveillance on referred patients to hospitals upon such symptoms. It is also concluded that existence of birds inside or nearby human inhabited places should be questioned.

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