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Case Report

Uncommon Human Urinary Tract Myiasis Due to *Psychoda* Sp. Larvae, Kashan, Iran: A Case Report

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Abstract

Contamination of human and animal body tissues with flies' larvae and diptera cause myiasis. A 26 yr old female patient refers to Kashan Shahid Beheshti Hospital, central Iran because of urogenital infection, pain in the right part of stomach, smelly and reddish vaginal discharge and frequent urination. In the first checking, urine sample was taken. In the sample, active and alive larvae were seen. The live samples were taken to the Environmental Health Department Lab of Kashan University of Medical Sciences in clean glass jars. In the morphological survey, *Psychoda* sp larvae were identified. In Iran, this study is the first report of this species of larva that causes urinary myiasis. This fly larva is not carnivore or bloodsucker and feeds on bacterial agents. Observance of personal hygiene especially during defecation and urination is essential to prevent contamination of this type of myiasis.

Introduction

Myiasis is rooted from a Greek word "myia" which means initial stage of files' life. It was first used by Hope in 1840 (1). Human Myiasis refers to the contamination and attack of dipterous larvae to human living tissues (2). One of the proper places for growth and reproduction of flies' larvae is hay and straw barn during winter (3). Flies' eggs are usually in less than 20 numbers in each group, but sometimes they are increased to 50 or 100 numbers. Female flies lay their eggs on decaying plants, greenhouses, mixed and wet hay and straw. On proper conditions, larval stage is 6 to 8 days but in colder

weather or food, shortage it may takes 4 to 5 weeks or more (4). Myiasis is classified as dermal, respiratory system, nasopharyngeal, ophthalmic, auricular, gastric, rectal, intestinal and finally urinary myiasis which is the most uncommon type in human, because cloth protection and inaccessibility of genital area to flies prevents them from laying eggs (2,5). Myiasis can be described as obligatory, opportunistic or pseudo. In obligatory myiasis, it is essential that larva feed on living tissues. In opportunistic type, larva may attack a corpse. Myiasis of gastrointestinal system in human does not occur but accidental swallowing of eggs or larvae of flies with food, can cause gastrointestinal myiasis (pseudo myiasis) (6). If this larva causes illness, it is called myiasis (4). Myiasis is formed in the body tissues because *Cyclorrhapha* suborder of flies laid eggs and larvae and subsequently they grow. Flies' larvae feed on living and dead tissues and in the case of gastrointestinal myaisis, they feed on host's food and this causes serious damages to the mentioned tissues. Ulcer myiasis is common in unsanitary places and especially if it is combined with bacterial infection, it becomes problematic. Regarding the life cycle, need of favorable environmental conditions and meeting the thermal needs, the spread of myiasis producing flies mostly occurs in the warm and hot seasons. Therefore, these flies are mostly spread in tropical areas and their spread is universal. In the world, more consideration is given to myiasis contamination specially in livestock because in addition to economic loss and decrease of ranchers' income, subsequently there is risk of human ulcers and skin contamination that threatens human health(6). As mentioned and according to reports, in most parts of the world , miyasis agents cause many economic damage and loss but what is significant is the adverse impact on society's health and subsequently each individual (7).

Human myiasisis cases have been reported in different areas of the world in different organs like eye, skin, mouth, ear, and children's genitals. Badry et al. reported *Clogmia albipunctata* Williston larva in their patient's urine in Egypt (8), Güven at al. recognized *Psychoda albipennis* larva as the cause of urinary myiasis in a 50 yr old female patient (9). Also in Iran, Ghavami and Jalilvand reported the existence of the *Megaselia scalaris* larva in 18 yr old boy is urine in Zanjan in 2014 for the first time (10). Özkol and Çalka extracted a Furuncular larva from the head of a 12 yr old boy in Turkey in 2013(11). Ayatollahi et al. reported some cases of *Oestrus ovis*, eye myiasis, in four male patients with average age of 34 yr in Yazd province in 1992 (12). Ghafori et al. reported Nazopharengial myiasis in the nose of a 52 yr old female hospitalized in I.C.U. in 2011 (13). Salimi et al. found *Lucilia sericata* larva from an 86 yr old Araki male's urine in 2010(14). In addition, Talari et al. took out *Chrysomya bezziana* species from the middle ear for the first time in Kashan, Iran (15). *Lucilia sericata* species were taken out from a 36 yr olds' arm (16). Many fly species can cause urinary myiasis but *Fannia scalaris* larva is the most common cause of it (17). Other fly species in the world related to urine are *Musca, Sarcophaga, Lucilia, Wohlfahrtia* and *Calliphora* (14).

In addition, there are few reports of urinary myiasis caused by *Eristalis* (18, 19), *Psychoda* (9), Megaselia (20) and *Clogmia albipunctata* (21) larvae in the world. However, until now in Iran there has been no report of *Psychoda* larva's myiasis. We can say that this study is the first report of *Psychoda*s' larvae as the cause of Urinary or urogenital pseudomyiasis in Iran.

Case report

A 26 yr old female patient living in Kashan referred to Kashan Shahid Beheshti Hospital because of urogenital infection. She complained of pain in the right part of stomach, stomach pain and cramps, nausea, loss of weight, smelly and reddish vaginal discharge and frequent urination for 6 months. Holding the urine was very difficult and painful for the patient. She lived in the basement of a greenhouse and when the place was visited, many

flies were seen. The place was also humid. At first, blood and urine tests were taken. Reports showed that everything was normal. However, in the patient's urine test, alive and active larvae were seen. According to the patient, six larvae have got out of her body in 2 days. The live samples were taken to the lab of environmental health department of Kashan University of Medical Sciences in glass jars. In morphological survey, *Psychoda* sp was identified by microscope and the use of identification keys (2) (Fig. 1, 2).

Fig. 1: *Psychoda* larvae collected from patients' urogenital tract

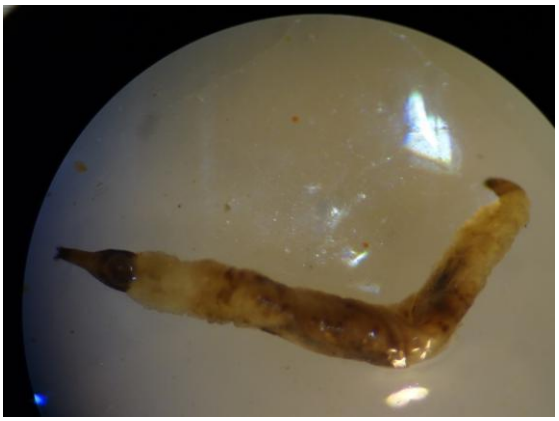

Fig. 2: *Psychoda* larvae collected from patients' urogenital tract

Discussion

Myiasis is an illness caused by infection of vertebrates tissues by Dipterans larvae. This illness is often seen in domestic and wild mammals all over the world. It is also mostly seen in humans who live in rural areas and have close connection with animals (22). Psychodidae family includes six subfamilies, which only two of them have hygienic and medical importance. Blood sucker sand flies, which are leishmaniasis vectors and their *Psychoda* larva, cause accidental myiasis that results in vomiting, faeces, urine, and menstruation, and this is because of insufficient hygiene in patients and bacterial agents existence (23, 24). Myiasis has become epidemic in all the tropical areas but it is mostly reported in the warm and humid areas. Reported cases during the year, is generally limited to summer months (25).

Urinary myiasis, in addition to clinical symptoms like itching and burning in genital area, causes infertility (26) and vaginal disfiguration in females which has a negative effect on their positive attitude toward marriage (27). In recent years, Doa et al. studied 5 different species of *Psychoda* larvae in urine from the physiological point of view. Urinary myiasis is very rare in human and one must be more suspicious of this larva in patients with urinary problems (28).

Less than 38 reports have been published on different types of urinary myiasis, such as *Dermatobia hominis* urinary myiasis in The United States (29), *Chryzomya bezziana* in Iran (30) and India (31), *Lucilia sericata* in Slovakia (32), *Eristalis tenax* in Spain (33) and Nigeria (34) and *M. scalaris* myiasis in Saudi Arabia (20). Only in 5 cases of 38 reports, *P. albipennis* is the main cause of urinary myiasisis (9, 35-38). However, this report is the first rare case based on observation of this larva in Iran. In our study, cause of the patient's illness to *Psychoda* larva urinary myiasisis is not clearly defined yet but it may have happened while using the toilet, and because of the genitourinary infection of the patient, it has attracted this type of pseudomyiasisis agent. These species of larvae feed on bacteria. Their natural place

of living where humans are is toilet, which is rich with bacteria agents.

In case of human contamination or infection, insufficient sanitation in restrooms can be the cause the individual's contamination (14, 24). This larva can be active in places where proper conditions such as latrine, for laying eggs are provided and also favorable foods for larva is available. Therefore, if female genital is infected, it will be full of bacteria, which provide proper food for larvae. Because of the continuous discharge of patient's vagina and hard itching of that area, suitable humidity for larvae growing is provided. Often, this type of myiasis is more available in the villages, which have lower level of hygiene. In rural areas and the suburbs may be used Unsanitary toilet (without cover) and this problem can cause infection.

This report is from the suburb of Kashan that its toilets' condition is similar to rural areas. Use of disinfectant and insecticides, installing fine window nets to prevent insects entrance into living areas, regularly washing clothes and drying them under the sunlight, proper covering of genital area specially in warm seasons and observance of hygiene in working areas are very important. Also training the healthcare providers and familiarity with these illness especially in areas where outbreak of this illness is high can cause reduction of this type of contamination.

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