Case Report

First Record of Urogenital Myiasis Induced by *Megaselia scalaris* (Diptera: Phoridae) from Iran

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Abstract

Myiasis is the infestation of organs and tissues of human and animals with fly larvae. This article reports an 18 year-old man with urogenital myiasis, the passing of live *Megaselia scalaris* larvae in the urine, from Zanjan City, northwest of Iran. We discourse the importance of diagnosis and management of urogenital myiasis in medicine.

Keywords: Urogenital myiasis, *Megaselia scalar*, Scuttle fly, Phorid larva

Introduction

Myiasis, the infestation of organs and tissues of human and animals with fly larvae, is a common phenomenon especially in people of tropical and subtropical areas. In spite of occasional reports of obligatory myiasis, the majority of reported cases are facultative myiasis and more than a dozen families of flies can cause this form (Gullan and Durden 2009). Phoridae, commonly known as humpback or scuttle flies, is the most important family of dipteran that causes myiasis and various problems for human. In this family genus *Megaselia*, perhaps the largest genera of living organisms, has a wide variety of life styles and polyphagus diet (Disney 2008). Among identified species of this genus, *M. scalaris* is a cosmopolite and synanthropic one. It has been unwittingly carried around the world by human (Disney 2008) and previously has been reported from Alborz Province in Iran (Zamani 2009). Adults of scuttle flies which are very small (2–4 mm in length), can explore a large variety of environmental and ecological habitats. Females of these flies are highly attracted to strong of foul odors and lay their eggs on different decomposing materials such as fruits, stole, meat, excrement and carrions (Disney 2008).

The scuttle flies which are important agent of human facultative myiasis, exhibit a greater diversity of larval habitat than other insects. These flies can explore a large variety of environmental and ecological niches (Disney 2008). In spite of predation and parasitation of some arthropods by this species (Costa et al. 2007), previous studies showed them as a cause of human myiasis (Francesconi Lupi 2012). Moreover, they have already been a polyphagus species and may be harmful to health as they become vector of pathogens (Disney 2008). Several clinical forms of myiasis such as cutaneous (Biery et al. 1978, Carpenter and Chastain 1992, Hira et al. 2004) and intestinal (Kaneko et al. 1975, Sing et al. 1989, Mazayad et al. 2005) myiasis have been induced by *M. scalaris*. However, the urogenital form is rarely seen and all of reported cases are restricted to females. So the study of men clinical manifestation as well as morphology of third instars larvae of these

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flies seems to be important. The aim of this paper is to report a case of man urogenital myiasis involving and to discourse the importance of its diagnosis and management in clinical science.

Case presentation

An 18 year-old man living in Zanjan City, northwest of Iran, presented to Ayatollah Mosavi Hospital at Zanjan University of Medical Sciences with history of difficulty in urination and maggot discharging. He was uncircumcised. For his history of nocturnal enuresis and depression, he was medicated by venlafazine, alpirazolam and nortriptrin. Physical examination and Sonography of cortex of bladder and kidneys were normal. However, small echogenic floating particles were seen in bladder (Fig. 1). He received mebendazole (2 mg tablet) orally and washed his urogenital area with solution of xylocain (2%) and Iodine (1%). After an hour the urine sample was collected in clean container. The urine was yellow in color and laboratory examination showed microhematuria, proteinuria and leukocyturia. Moreover, 2 larvae were found upon collected urine. The larvae were forwarded to the Department of Medical Entomology and Vector Control for further studies. All symptoms disappeared on the next day of specimen collection.

Microscopic examination showed that all larvae were alive, whitish in color and pale intestinal content in the third terminal part (Fig. 2). One larva was preserved in 70 % ethylic alcohol and the other cultured in nutrient rich medium to complete its life cycle but it died after 1 day. The length and width of larvae ranged from 6.8 to 6.9 and 0.68 to 0.69 mm respectively (Fig. 2). Precision microscopic examination of larvae revealed the presence of short spinous (peglike) processes on the integument. The larval head was noncapsulate, being reduced to mouth hooks and supporting cephalopharyngeal skeleton which was developed and supported large areas of the head (Fig. 3). The anterior spiracles were located on each latero-posterior edge of the prothorax each had about 8–10 rays. A pair of posterior spiracles protruded dorsally on the 12th segment each appears with large and slender plate. The spiracle hairs appear centrally, at the area of construction. Dorsal and lateral trunks were present and well developed. In addition to their anterior and posterior union the dorsal and lateral trunks were joined by transverse connectives (Fig. 4).

Based on characters and previous descriptions of researchers (Sukantason et al. 1994, Harison and Cooper 2003, Boonchu et al. 2004, Disney 2008) the larvae were definitely identified as *Megaselia scalaris*, facultative myiasis parasite belonging to the Phoridae family. The voucher specimens were retained in the Department of Entomological Systematics at University of Tarbiat Modarres.

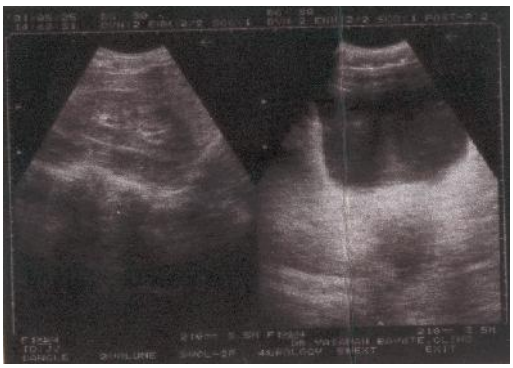

Fig. 1. Sonography of cortex of bladder with, small echogenous floating particles

Fig. 2. Third instars larva of *Megaselia scalaris*

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Fig. 3. Anterior section of third instars larva of *Megaselia scalaris*

Fig. 4. Posterior section of third instars larva of *Megaselia scalaris*

Discussion

Urogenital myiasis, the infestation of genitourinary organs by maggots, based on the anatomical location could be classified as external or internal myiasis. External urogenital myiasis is clinically, epidemiologically, and entomologically similar to wound myiasis but it affects women more commonly. Internal urogenital myiasis is a rare event and occurs when the maggot reaches an internal genitourinary organ. All described cases are considered as accidental cases and uncommon myiasis agents are associated with *M. scalaris*, *Psychoda albipenis* and muscoid flies (Francesconi and Lupi 2012).

Several previous researchers reported cases of wound (Disney 2008), intestinal (Mazyardand Rifaat 2005) and nasocominal myiasis (Hira et al. 2004), due to *M. scalaris.* However, the published cases of genital myiasis are very few in number and these reports refer to patients of various ages. The first report of human urogenital myiasis due to this species was reported in 1978 by Disney and Kurahashi and then other cases were reported (Ramalingam et al. 1980, Cilla et al. 1992, Saleh and el- Sibae 1993, Yildiz et al. 1997, Delir et al. 1999, Perez-Eid C, Mouffok 1999, Rodriguez and, Rashid 2001, Passos et al. 2002).

This is the first report of urogenital myiasis due to *M. scalaris* in Iran. There is a paucity of such information from this country, probably because specimens tend to be discarded without study, due to lack of experience in identifying fly larvae and in the absence of reference center. We hope that our report will stimulate others to present similar clinical findings and to contribute to the pool of knowledge on the subject in Iran. To the best of our knowledge, only one paper documented the distribution of *M. scalaris* in Iran. So we hope that in the coming future special aspects of this species will

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be studied in Iran.

The identification of larvae of *Megaselia* sp posed difficulties here because none could be reared to adult for conformation based on adult morphology. However, the available characteristics were enough to distinguish *M. scalaris* larvae.

The passing of live *M. scalaris* larvae in the urine indicated infestation of the urogenital system. The reported infestations (Pryianond et al. 1973, Biery et al. 1978, Sing et al. 1989) were normally, a secondary consequence of some obstructions to the normal flow of the urine, such as stone formation in the bladder.

Our microscopic examination showed that the larvae were probably mature; at least second to third instars transition, and may have been seeking a place to pupate. It is worth mentioning that identification of the immature larvae of parasite causing myiasis posed difficulties particularly the parasite with little available knowledge. However, the available morphological characters of the larvae especially the cephalopharyngeal skeleton and the structure of spiracles can be used in differentiation of specimens.

Phorid flies basically find in tropical regions. However the global warming and the globalization of commerce have established conditions suitable for expand their wider distribution. The flies infesting the patients probably originated from a natural population near home in the residential area. The present case is probably accidental infestation related to lack of personal hygiene. It's likely that female of *Megaselia* deposited her eggs on the underwear clothing or directly on the urogenital area after being attracted by urine odor.

The rational treatment of genitourinary myiasis is to remove the offending larvae. In many cases when the diagnosis is done the maggot has already been expelled. Several substances such as antiseptic and anesthetic solutions have been used in the form of lavage (Francesconi and Lupi 2012). It seems, in our case, oral administration of 2 mg mebendazole and washing the urogenital area with solution of xylocain (2%) and iodine (1%), cured the myiasis. Since the urogenitoury tract has inaccessible area, removed of maggots is difficult by conventional instruments, to overcome this problem we used urogenital lavage with xylocaine and iodine solution in our patient. Xylocaine causes spastic paralysis in parasites straight muscles and this way the paralyzed larva was easily removed.

Medical personnel should take care of susceptible patients especially those with nocturnal enuresis, need to bear in mind the possibility of infestation with scuttle flies larvae, be able to make a prompt diagnosis of myiasis and implement relevant intervention to prevent tissue infestation. Prevention of this condition is important and involves use of insect repellents and insecticides for control of fly population, adequate protective clothing, good skin and wound hygiene to keep flies from reaching the skin, covering open wounds, change dressing daily, hang clothes to dry in bright sunlight and/or iron them and improve hygiene and sanitation. Because the size of gravid flies is very small, window screening and mosquito nets cannot effect on personal protection. Besides, so much attention is paid to large muscoid flies that may cause myiasis, it is likely that the small phorids are unnoticed or ignored, which may lead to an increase in the occurrence of phorid myiasis. We need to emphasize that this myiasis rarely occurs in healthy individuals and neglected personal hygiene is the single most important factor in human infestation.

Conclusion

Nowadays the global warming and commerce globalization change the geographical map of scuttle flies and observation of the

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scarce case of urogenital myiasis in Iran, represents their wide distribution. Since *M. scalaris* can possess considerable larval habitat, its creation of various clinical forms of myiasis is imminent. Therefore, we hope that our reported case will stimulate researches to present similar findings and we expect several aspects of this species will be studied in future. In addition medical personell should take special attention to susceptible cases and be able to diagnose myiasis as well as implicate relevant interventions to prevent new infections.

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