

First Data on Nosocomial Myiasis caused by *Wohlfahrtia magnifica* in Tunisia

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Rec date: Jun 24, 2015, Acc date: Jul 24, 2015, Pub date: Jul 26, 2015

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Abstract

Myiasis is the infestation of live human and vertebrate with dipterous larvae that feed on the host's tissues. We report a case of a nosocomial oral myiasis in an unconscious patient.

Keywords: Myiasis; *Wohlfahrtia magnifica*; Tunisia

Introduction

The term myiasis (Greek: myi = fly, asis = disease) is used to refer to the infestation of living tissues of human and animals by dipterous larvae [1]. It occurs worldwide, but more often in hot and humid climates. Each fly species has specific geographical distribution. Species causing myiasis can be obligate, facultative, or accidental.

Clinical presentation of myiasis varies according to the causative species involved and the anatomical location of the larvae [2].

Although myiasis is a common phenomenon to be observed in skin in people and animals living in tropical and subtropical areas, it has rarely affected the oral cavity [3,4].

It is important to draw attention to the hazard of myiasis under exceptional conditions. Nosocomial myiasis, first reported in 1980, is a term used when the infestation affects subjects in hospital settings. Unfortunately, it happens particularly in patients with open wounds/sores and areas that are heavily infested with flies.

Sadly, care taker neglect may be a factor in such places as nursing homes or hospices. Here, we report a very rare case of infection in a patient admitted to an urology unit in Sfax, (South of Tunisia).

Case Report

An 85 year-old man was transferred from regional hospital of Jbeniana Sfax on the 13th October 2014, to the urology unit for cystoscopy in order to insert a urethral probe. The patient having a unique left kidney, suffered from pyelonephritis and presented a uremic syndrome thus has had a hemodialysis session.

In the urology unit, due to the worsening of the renal function, the patient has few more hemodialysis sessions. The intervention took place on the 30th October 2014 and led in a circulatory shock. Therefore, the patient was transferred to the surgical intensive care unit (SICU). An intubation was performed, a nasogastric feeding tube was placed, appropriate therapy initiated and the patient was kept sedated.

On the first day of hospitalization, while performing an oropharyngeal aspiration, about 20 maggots were found fortuitously. Maggots were seen on the palate and around the intubation pipe. The

maggots were, then, sent to the parasitology laboratory for identification. The patient died after two days due to a circulatory shock. The larvae showed the typical maggot like body shape and were identified as the third instar of *Wohlfahrtia magnifica*. Identification of larvae by light microscopy was carried out by examination of their size, segmentation, posterior spiracles, cephalo-pharyngeal skeleton and spines.

Before being mounted on slides, the larvae were cleared in a 30% aqueous solution of KOH. Additional maggots were conserved in formol. Species identification was done using the following keys:

- Pictorial keys to arthropods, reptiles, birds and mammals of public health significance.
- Keys for identification of immature insects.
- Laboratory identification of arthropod ectoparasites.

The collected maggots were 10–18 mm in length with a beige coloring (Figure 1).



Figure 1: The larva of *Wohlfahrtia magnifica*.

The peritremal cavity appears as a deep depression. It included the posterior spiracles. The spiracle area was surrounded by 10 to more tubercles symmetrically arranged. The larvae also showed an incomplete peritreme.

The inner slit within the spiracles was directed away from the median line ventrally (Figures 2 and 3). The larvae had as well two thick and long curved hooks (Figure 4), anterior spiracles and spines of third instar larva.



Figure 2: Light microscopic appearance of the posterior spiracles of third instar larva of *Wohlfahrtia magnifica*

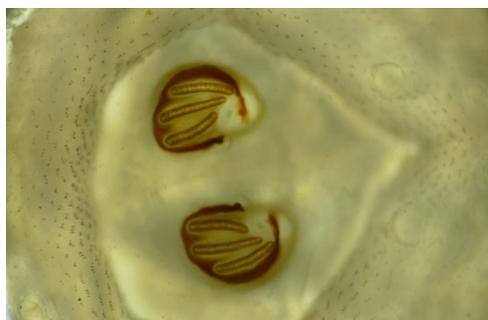


Figure 3: Light microscopic appearance of the posterior spiracles of third instar larva of *Wohlfahrtia magnifica*



Figure 4: Cephalopharyngeal skeleton of third instar larva.

Discussion

In Tunisia, there are few reported studies on human myiasis caused by *Oestrus ovis* [5-9]. This is the first reported case of *Wohlfahrtia magnifica* myiasis in our country. The uniqueness of the present case is that myiasis occurred in a non-ambulatory patient under ventilator with naso-gastric tube and was hospital acquired. We suspected that the present case was a nosocomial infection because the patient had spent 17 days in the urology unit, and the maggots were found on the day of admission to the SICU. It is attributed to poor general hygiene in the hospital facility and reflects a lack of adequate care, especially for patients who need close attention. Flies usually attack patients who

are immobile, injured or severely ill. Oral myiasis might occur in patients whose health conditions are most likely to cause prolonged mouth opening [10], which is the case for this sedated intubated patient. In a study of human myiasis in Hong Kong, the oral cavity was found to be the most affected site with myiasis in non-ambulatory patients with nasogastric feeding tube [11].

Although this form of infestation is considered rare, it may be underreported in developing poor countries. It is estimated to occur in 5% of all acute care hospitalization. Lukin and Sherman reported 5% and 43% of nosocomial infections respectively in Australia and in North America [12,13].

The following species have been recognized as causative agents of nosocomial species: *Lucila sericata*, *Megaselia scalaris*, *Sarcophaga spp.*, *Cochliomyia hominivorax*, *Cochliomyia macellaria*, and *Musca domestica* [2].

Wohlfahrtia magnifica is a frequent fly in countries with high breeding activity: Australia, South Africa or Arab country. The prevalence of wohlfahrtiosis in sheep and goats appears to be higher in Eastern Europe (30%–50%) and lower in the Mediterranean basin countries (0.7%–8.5%) [14].

Frequently, larvae of *W. magnifica* infest natural orifices [15]. The parasitological infestation occurred essentially during the summer, favorable period to the biological evolution of myiasis.

Standard guidelines for treating oral myiasis does not exist. The most followed procedure is the mechanical removal of the larvae. Some authors suggested occlusion to deprive the maggots from oxygen and make them move to the surface. The substances used are paraffin, nail polish, turpentine oil, mineral oil, ethyl chloride and petroleum [14,16]. Recently systemic ivermectin has been tried in many patients with successful results [17]. It is the only antibiotic which has been found to be effective against maggots. Mechanism of action is through blocking nerve impulses on the nerve endings of the larvae through the release of gamma aminobutyric acid (GABA) and linking to the receptors, causing palsy and death [17].

To prevent myiasis, good personal and environmental hygiene is of paramount importance. Regular screening of the dependent's oral cavity, especially on nasogastric tube feeding, is crucial for early detection or infestation and treatment. Fly proofing measures, such as installation of window screening, insect electrocuting devices or fly trap, should be considered [15]. Prevention of nosocomial myiasis could require controlling fly populations in the hospital environment by efficient sanitary and waste disposal, reducing odours of decomposition and more radical approaches such as insecticide sprays.

Knowledge of the distribution and phenology of the species is equally important, yet data are still extremely fragmentary. More in general, accurate and comprehensive information on the distribution of species of medical and veterinary importance is lacking in Tunisia, and making 'infestation maps' available for veterinary interventions as well as for ecological and biological studies should be a priority objective.

Conclusion

Nosocomial oral myiasis is a rare and preventable disease. This paper puts emphasis on the importance of sanitation and hygiene in hospitals for the prevention of myiasis. The disease can be prevented

by adequate control of insects and maintaining a good oral and corporal hygiene of the patient regardless of their consciousness state.

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