

Case Report

Examining A Case Report of Nasopharyngeal Myiasis Caused by *Lucilia sericata* in Central Iran

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ABSTRACT

Background and Purpose: Myiasis is an infestation of vertebrates caused by the feeding of fly larvae on the living or necrotic tissue of hosts. Human myiasis is more prevalent among people who live in unsanitary conditions or have close contact with domestic animals. In this report, a case of nasopharyngeal myiasis in a 63-year-old patient admitted to the intensive care unit is presented.

Case Presentation: A case of nasopharyngeal myiasis in a 63-year-old man with heart and respiratory failure in a hospital in Tehran City, Iran, is reported. By investigating the morphological characteristics of the isolated larvae and cultivating the pupa, *Lucilia sericata* was identified.

Conclusion: It is recommended that necessary operations be carried out to prevent the entry of insects, including flies, into hospitals and control of them.

Keywords: Calliphoridae, Screw worm infection, Myiasis, Nasopharyngeal

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Introduction

Myiiasis is caused by the laying of eggs of fly larvae on living or dead tissues of the vertebrate hosts. The larvae may attack their hosts through wounds and the natural cavities of the body, including the mouth, ears, eyes, nose, and genitourinary tract [1]. Myiasis is known as a rare human disease and is mainly found in tropical and subtropical areas [2].

Different species of true flies can cause myiasis around the world [3]. The most important flies that cause human myiasis are in four families: Sarcophagidae, Calliphoridae, Muscidae, and Oestridae [4]. In the Calliphoridae family, the genus *Lucilia*, which is the agent of obligatory myiasis in animals and rarely facultative myiasis in humans, is dispersed worldwide [5]. From 1974 to 2018, about 81 cases of various kinds of myiasis, including wound, nasopharyngeal, auricular, oral, ophthalmic, genitourinary, and intestinal have been reported in Iran, due to clinical and anatomical features, most cases were related to oral myiasis [6]. However, nasal myiasis has been often seen in hospitals, usually caused by *Lucilia sericata* [7, 8]. Accordingly, this study reports a nasopharyngeal myiasis case caused by *L. sericata* in a patient with heart and respiratory failure in a hospital in Tehran City, Iran.

Case Presentation

In this study, a 63-year-old man with heart failure and diagnosis of coronary artery and mitral valve replacement referred to a hospital in Tehran. He was treated with long-term antibiotics and steroids for two weeks. The patient was hospitalized for one and a half months in the intensive care unit and had been taken out of the section to get some fresh air during the period of hospitalization. After a while, the physicians noticed the presence of 12 fly larvae in the patient's nasopharyngeal cavity. The symptoms of myiasis were mild in the patient. After removing all the larvae, the nasal and nasopharyngeal wash was performed with normal saline, and consequently, the symptoms of myiasis disappeared after 48 h and the patient returned to a normal state. Nevertheless, the patient died after 8 days due to severe respiratory and heart failure.

The maggots were transferred to the medical Entomology Laboratory of [Tehran University of Medical Sciences](#) for diagnosis and identification. According to the morphological characteristics of the last segment of the larvae body and respiratory organs, the collected

specimens from the patient were identified as *L. sericata* (Figure 1) [9]. The last segment of the body of the *L. sericata* larva has six conical-shaped tubercles around the peritreme and posterior spiracle. The posterior respiratory tract is the most important character for identification of the larvae [9]. The slits which are the entrance holes of the trachea are located obliquely in each spiracle to the center of the larva (Figure 2). Meanwhile, in the Sarcophagidae larvae, the slits are obliquely outwards or downwards, and in the Muscidae larvae, the slits are sinusoidal or S-shaped [9]. Also, a number of the collected larvae were raised in the Insectarium of the [Tehran University of Medical Sciences](#) to become adults, and adult flies were identified as *L. sericata* using morphological features [10]. During the adult stage, *L. sericata* has a bright green metallic thorax, hairless lower calypter on the dorsal surface, bright yellow basiocosta, hairless radius vein on the upper surface, the posterior slope of humeral callus with 6–8 hairs, and dark blue front legs (Figure 3) [10].

Discussion

Nasopharyngeal myiasis is a type of infestation with larvae of various dipterous flies that is often common in tropical and subtropical regions of the world [11]. In the study of Alizadeh et al., the infestation rate for nasal myiasis was reported at around 4% in Iran, most of which were reported from the south of the country, and the proven mortality rate due to nasal myiasis was 1.3% [12]. Due to the lack of a government reporting system for myiasis disease, accurate information on the status of this disease is unavailable in Tehran and most provinces in Iran. Myiasis is classified based on many factors, such as the location of the larva on the host, the causative agents, and the type of host-maggot relationship [1, 13]. Infestation of the host with larvae of dipterous flies occurs once female flies lay their eggs on the necrotic or living tissue of the human or animal body [13]. Various species of flies, such as *Chrysomya bezziana*, *Wohlfahrtia magnifica*, and *Oestrus ovis* which cause human myiasis have been reported in Iran [6, 14–16].

The most important family that causes myiasis is Calliphoridae, which includes the genera *Calliphora*, *Lucilia*, *Chrysomya*, *Cochliomyia*, and *Phormia* [4]. Facultative myiasis agents feed on the living or necrotic tissue of the host body. Flies of the genera *Calliphora*, *Lucilia*, and *Phormia* cause facultative myiasis and their larvae when placed on the open wounds help to create granular tissue, remove bacteria and necrotic tissue, and heal wounds [17]. The agents of obligatory myiasis, such as *Chrysomya* and *Cochliomyia* flies need to lay their eggs



Figure 1. The third instar of *L. sericata* larva isolated from the patient's nasopharyngeal cavity (development of larval age in the laboratory)

or larvae on the living tissue of the host to complete their life cycle. In terms of the location of larvae on the host, myiasis is classified as cutaneous, furuncular, gastrointestinal, genitourinary, nasopharyngeal, oral, nasal, auricular, and ophthalmic. The most common type of myiasis is cutaneous myiasis, which occurs in various forms of wound (traumatic), migratory, furuncular, and nodules [18].

Yassin reported a 62-year-old man with wound myiasis in Iran in which the myiasis agent was the larvae of *L. sericata* as in the present study [19]. Nosocomial myiasis is a rare phenomenon in hospitalized patients [20]. The physical weakness of patients, lack of hygiene, open wounds without dressing, wound bleeding, necrotic tissues, decomposition odor, and inattention to proper nursing care are some predisposing factors for nosocomial myiasis [21]. In patients with myiasis, secondary

bacterial and fungal infections may occur and this can be dangerous in patients with weakened immune systems [22].

Most myiasis, especially nasopharyngeal, oral, and nasal, is due to poor hygiene sleeping with the mouth open, and consequently laying eggs by flies inside the mouth. The most appropriate way to prevent flies is to maintain good personal hygiene, manage food waste, collect and dispose of garbage on time, cover wounds, and use window nets and repellents. Moreover, the use of electric indoor fly traps and bait traps can reduce the population of flies. Also, if the abundance of flies is high, insecticides with knock-down effects, such as resmethrin, can be used in the forms of spraying and fogging. It is recommended that measures be taken to prevent insects including flies from entering hospitals and control them [6, 23, 24]. Ivermectin is also used as a drug

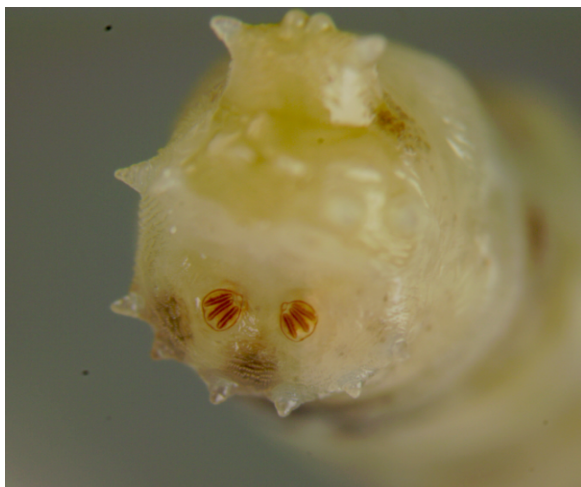


Figure 2. Posterior spiracles of *L. sericata* larva isolated from the patient's nasopharyngeal cavity



Figure 3. Adult stage of *L. sericata* raised in the Insectarium

in veterinary medicine to kill various ectoparasites and endoparasites of livestock [25]. Therefore, ivermectin can be used to destroy fly larvae in livestock and control their population in rural areas.

Conclusion

It is important to educate hospital staff about myiasis and the role of flies in disease transmission, along with planning to design appropriate control measures for flies in the hospital environment.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of [Iranshahr University of Medical Sciences](#) (Code: IR.IRSHUMS.REC.1402.017).

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Authors contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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