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Case Report

Human Extensive Head Skin Myiasis

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Abstract

Chrysomya bezziana Villeneuve is the most important fly, which produces myiasis, exists as an obligate ectoparasite in the animals, and afflicts human. Poor hygiene and working in contaminated areas particularly during warm seasons provide a situation to infest by this parasite. Infestation in human and livestock are often observed in wounds, normal body orifices such as eyes, ears, nose, and mouth. The manifestations include pruritus, pain, inflammation, redness, eosinophilia, and secondary bacterial infections and rarely death. A 5-year-old boy with severe headache and agitation symptoms was followed up. After physical examination and endoscopy, larvae of third instar fly were obtained from his scalp. Our precise identification indicated that the flies were the *C. bezziana*. This is the second report of the human scalp myiasis caused by *C. bezziana* in Iran. This study confirmed that the old world screwworm fly was distributed in the southern of Iran and probably could be one of the most important agents of myiasis in this area.

Keywords: Chrysomya bezziana, *Cutaneous myiasis, Iran*

Introduction

Myiasis is a parasitic infestation that results from an infestation of the tissues or organs of live humans or vertebrate animals by the larvae of dipterous flies (1). Human myiasis is a rare infestation that can occur in any part of the world, but is more common in the regions with a warm and humid climate. The infestation can strike organs or tissues that are accessible to egg lying and development of the larvae, which feed on living or necrotic tissue and body fluids, and necrotic lesions, provide an ideal substrate (2-4).

The relevant taxa of Calliphoridae (blowflies) cause the human myiasis. This family is divided into several subfamilies of which two, calliphorinae and chrysomyinae, are of medical and veterinary importance (5). The genus *Chrysomya* contain many species and about 10 species are known to cause myiasis in human, but only *C. bezziana* Villeneuve [1914], is the most important fly which produces myiasis. The Old World screwworm is largely restricted to tropical and subtropical climates, being most successful under hot and wet conditions and, conversely, most sensitive to prolonged cold or dryness (6).

The adult *C. bezziana* lays eggs on the living tissues of domestic and wild warm-blooded animals and human such as wounds, normal body orifices including the eyes, ears, nose, mouth and urogenital tract. Due to this parasitic mode of life, the Old World screwworm can be a serious pest of humans and, particularly, domesticated animals, causing severe trauma or even death and consequent economic hardship (7-9). The first stage larvae emerge from the eggs and move toward the wound or wet tissues. They feed on tissue fluid, change into stage 2, and stage three larvae, after 30 h and 4 d, respectively. The stage 2 and 3 larvae penetrate the living tissues of the host and nourish from it. While feeding, only the posterior spiracles are visible. Stage three larvae leave the wound after feeding, change into pupae and then fly (10).

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A 5-year-old boy with severe headache and agitation symptoms referred to the Pediatric Hospital in Bandar-Abbas City, Hormozgan Province, southern Iran, in March 2007. In the operating room, about 40 larvae of third instar fly larvae were pulled out under the general anesthesia condition. These larvae were sent to the Entomology Laboratory, School of Health, Hormozgan University of Medical Sciences for examination.

A total of 30 larvae were preserved in 70% methanol and the rest (10 larvae) were reared on ground beef placed on the top of moist soil in a mosquito net case under insectary condition at 30±2º C, 70±5% RH (11). The full-grown larvae crawled into the soil and all of them developed to adult flies later on after 8 d. The anterior spiracle openings from the mouthparts and the posterior spiracle openings of the third instar full-grown larvae were mounted on the slide. The larvae and adult flies were identified using larvae and adult flies identification keys available from sources (12-14).

Physical examination revealed a severe and extensive wound in the scalp where subcutaneous tissues were eaten by larvae. Endoscopy consideration revealed the presence of numerous larvae lodged inside the lateral sub marginal and the depth of the subcutaneous tissues of the scalp (Fig.1).

According to the available identification keys and the following adult flies and full-grown larva morphological characters, flies were identified the Old World screwworm, *C. bezziana*. Adult morphological characters including hypopleuron with prominent bristles, metallic color, base of the stem vein dorsally with row of the bristles (Fig. 2), anterior spiracles dark and the lower squamae waxy white concealed with fine hairs above, and larva morphological characters including body without prominent papillae, peritreme open, tracheal trunks slightly pigmented, posterior margin of segment 11 with dorsal spines and anterior spiracles with 4-6 papillae and posterior spiracles are each encircled by a heavily sclerotised peritreme which is incomplete ventrally and with 3 slit-like spiracular opening at approximately 45 degrees to the horizontal (Fig. 3).

The identification of larvae and adult flies of *C. bezziana* was confirmed by Dr Martin Hall, Department of Entomology in the Natural History Museum, Londen.

Five adult flies (3 males and 2 females), eleven full-grown larvae, and seven pupae have been deposited in the collection of the Entomology Laboratory, School of Public Health, Hormozgan University of Medical Sciences, Iran.

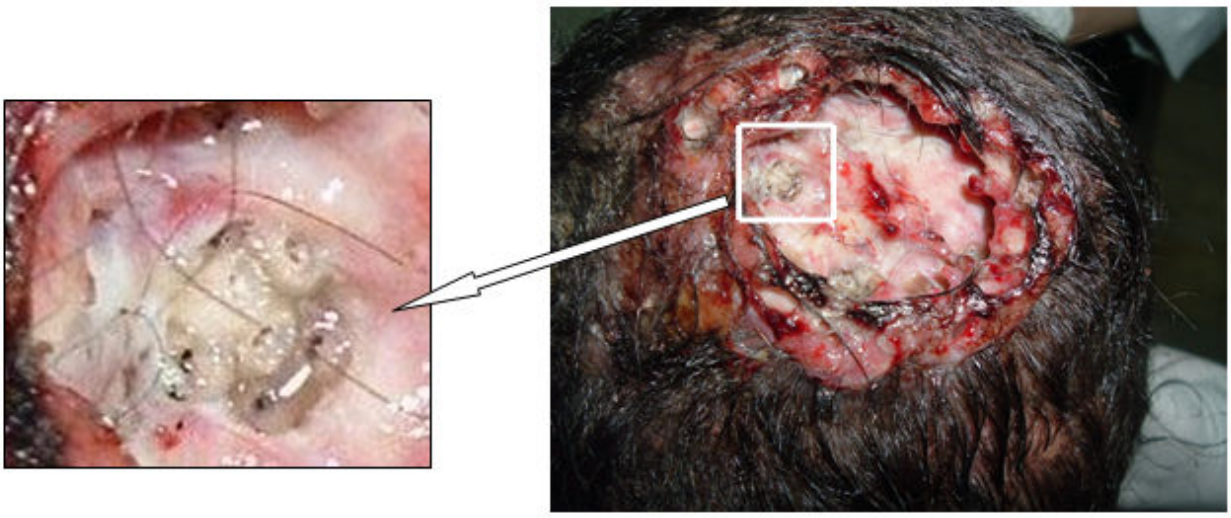

Fig. 1: Scalp human myiasis: showing massive *Chrysomya bezziana* larvae infestation (original photos).

Fig. 2: The adult fly of *Chrysomya bezzianna* (original photos), magnification: ×10

Fig. 3: Spiracles of the full-grown third instar larvae of *Chrysomya bezzianna*: (A) Posterior, (B) Anterior (original photos), magnification: ×400

Discussion

C. bezziana occurs throughout tropical Africa, Indian subcontinent, in most of the south-east Asia to China, and the Philippines to Papua New Guinea, it also has been introduced to several countries on the west coast of Persian-Gulf, including Iraq (15). Infestations with *C. bezziana* differ from usual maggot infestations because *C. bezziana* can cause tissue invasion without pre-existing necrotic tissue and can cause extensive damage to living tissue if the condition is left undiagnosed. The infested wound may be further complicated with bacterial infestation (16). The larvae of *C. bezziana* infested living tissue thereby causing myiasis in the wide rang of warmblood host species (17). Human myiasis is a rare condition in any part of the globe, but is more common in the regions with a warm and humid climate. There are varieties of case reports from the tropics describing aural, nasopharyngeal, and ocular myiasis (18). In Iran, occurrence of *C. bezziana* had been noticed in Bandar-Abbas at the coast of Persian-Gulf since 1975 (11). Then spread throughout the southern coast of Iran. Including an introduction of *C. bezziana* into Bushehr (a port on Persian-Gulf) in April 1995 (19-20), and an outbreak of the Old World screwworm in Khuzestan Province in spring 1995 (19). Minor incursions have also occurred in other countries in the coast of Persian-Gulf, including an introduction of *C. bezziana* into Bahrain in 1977 (21) and into the United Arab Emirates in 1988 (22). Sporadic cases of the Old World screwworm myiasis also occurred in Saudi Arabia, in humans (23) and livestock (24-25). Thus, all countries in the coast of Persian-Gulf are endemic for Old World screwworm.

The first human scalp myiasis of *C. bezziana* infestation was reported by Davami et al. in 2005 from Iran (26). The case described in this article is the second human scalp myiasis of *C. bezziana* infestation in Iran. The life history of the patient indicated that in his home courtyard was kept goats and usually resting near them when were exposed to the fly attack at mid-days. The condition of the patient's scalp before the infestation was showed poor personal hygiene, lack of medical care and badly body odor without any disease and lesions on scalp. It is hypothesized that flies are instinctively attracted to the odor of disease or decaying matter, like that of chronic wounds. A chronic diseased state in the setting of poor hygiene and lack of medical care can lead to maggot infestation. The tropical climate of southern of Iran is another factor that is suitable to grow flies. In this area the incidence of myiasis was generally low and seasonal, with most of cases reported during cooler season of the year when there is occasional rainfall, and rare during the hot, dry warmer months. Larvae cause local tissue destruction by the secretion of collagenases and may burrow deep into tissue so they may find a safe place to pupate (27). On the initial examination of suspected wound, good lighting and careful inspection is required, as larvae may be small and buried deep into the wound. Identification of the species is important for further management. Once the identification of an obligatory parasite is confirmed, early treatment should be offered. The most common presenting signs of scalp cuticular maggot infestation include pain, severe headache, agitation symptoms and tissue erosion (28). Prevention of human myiasis involves control of fly populations and general hygiene. Predisposing factors considered important are the presence of pre-existing, suppurating lesions that attract flies and stimulate the female insects to deposit eggs or larvae, acquired immunodeficiency, comatose conditions, habits among the population of sitting on the ground as, for example, during certain religious rites, poor personal hygiene, principally among some residents of rural areas and certain climatic conditions that favor the flies (29-30). This study confirmed that the Old World screwworm fly, *C. bezziana*, was distributed in the southern of Iran and probably could be one of the most important agents of myiasis in this area.

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