

Case Report

First Report of Pharyngostomy Wound Myiasis Caused by *Chrysomya bezziana* (Diptera: Calliphoridae) in Iran

*Mussa Soleimani-Ahmadi^{1,2}, Hassan Vatandoost³, Ahmad Ali Hanafi-Bojd³, Fatemeh Poorahmad-Garbandi⁴, Mehdi Zare⁵, Seyed Mohammad Vahid Hosseini⁶

¹Department of Medical Entomology and Vector Control, School of Public Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

²Infectious Diseases Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

³Department of Medical Entomology and Vector Control, School of Public Health and National Institute of Health Research, Tehran University of Medical Sciences, Tehran, Iran

⁴Bandar Abbas Health Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

⁵Department of Occupational Health Engineering, School of Public Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

⁶Department of Pediatric, School of Medicine, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

(Received 27 Aug 2012; accepted 15 Apr 2013)

Abstract

Wound or traumatic Myiasis is the infestation of animal and human orifices or wounds by dipterous larvae. It is more common in tropical and sub-tropical countries.

Chrysomya bezziana is a major agent of wound myiasis throughout the tropical regions of the Old World. In Iran many cases of human myiasis due to *C. bezziana* were reported from south and south-east of country.

This study reports a case of wound myiasis in a 3-year-old pharyngostomized girl who referred to the Pediatric Hospital in Bandar Abbas for pharyngological follow-up. During the examination, several live and mobile larvae were removed from the lesion. The patient received antibiotics and then transferred to pediatric ward for respiratory care. The specimens were identified as *C. bezziana* according to the morphological characters of fully grown larvae.

This is the first report of the pharyngostomy wound myiasis caused by *C. bezziana* in Iran.

This finding also confirms the results of previous studies indicating the occurrence of the Old World screwworm fly, *C. bezziana* as a causative agent of human myiasis in the south of Iran.

Keywords: *Chrysomya bezziana*, pharyngostomy, wound, myiasis, Iran

Introduction

Wound or traumatic myiasis is the infestation by dipterous larvae of primarily the cutaneous tissues in animals and humans, usually at the sites of orifices and wounds openings into the body (Sherman et al. 2000). Besides open wound, predisposing factors for wound myiasis in human include poor social condition, poor overall hygiene, advanced age, very young age, illness, mental retardation, diabetes and physical inability to prevent flies from depositing their ova (McGraw and Turiansky 2008).

Cochliomyia hominivorax and *Chrysomya bezziana*, New World and Old World screwworms, respectively, are two important species of screwworm flies that cause obligatory wound myiasis in humans, domestic mammals, and wild mammals (Robbins and Khachemoune 2010).

Human cases of *C. bezziana* myiasis are most prevalent in India and Southeast Asia (McGraw et al. 2008). In Iran, the first case of human myiasis due to *C. bezziana* was reported in 1978 (Jdalayer et al. 1978). Re-

cently, human cases of myiasis caused by *C. bezziana* in south and south-east of Iran have been increased as nasal myiasis (Tirgarie et al. 2003), scalp myiasis (Davami et al. 2005, Soleimani Ahmadi et al. 2009), oral and traumatic myiasis (Faramarzi et al. 2009), and orbital myiasis (Khataminia et al. 2011).

The present paper reports a case of pharyngostomy wound myiasis due to *C. bezziana* for the first time in Iran.

Case report

A 3-year-old girl who resides in a rural area in Sirik District, Hormozgan Province, south of Iran referred to the Pediatric Hospital in Bandar Abbas, in July 2011. She ingested aluminum hydroxide powder by accident. Patient underwent flexible pediatric endoscopy by a gastroenterologist on arrival, which showed severe burns of oral cavity and esophagus. She received anti-secretory agent, antibiotics, and hydrocortisone. Physicians devised a pharyngostomy tube in right side of her neck by number 32 mushroom catheter and the esophagus was closed by a prolene mesh plug which completely was filled with cyanoacrylate glue to prevent swallowing of saliva (Fig. 1).

Nine months after the first diagnosis, the patient referred to hospital for pharyngological follow-up. During examination of the patient, with a lateral motion of the flange of the pharyngostomy tube, many larvae observed between the tube and the pharyngeal wall. The lesion was macroscopically cleared of visible larvae by mechanical removal. The procedure had to be repeated three more times to extract all larvae. A total of 23 third-instar larvae were collected from the patient, the bed and the floor of the ward. The patient received antibiotics, anti-secretory agent and then transferred to surgical ICU for respiratory care.

Larvae were preserved in 70% methanol and sent to the Entomology Laboratory, School of Health, Hormozgan University of Medical Sciences for identification. The larvae were 12–15 mm long, whitish and without prominent papilla. Other morphological characters of the specimens included, open peritreme, slightly pigmented tracheal trunks, posterior margin of segment 11 with dorsal spines, anterior spiracles with 4–6 papillae, and each posterior spiracles encircled by a heavily sclerotised peritreme which is incomplete ventrally and with 3 slit-like spiracular opening at about 45 degrees to the horizontal (Fig. 2). The full grown larvae were identified using the morphological characters based standard key (Zumpt 1995).



Fig. 1. Human wound myiasis caused by *Chrysomya bezziana* in a girl with pharyngostomy after removing the larvae (Original photo)

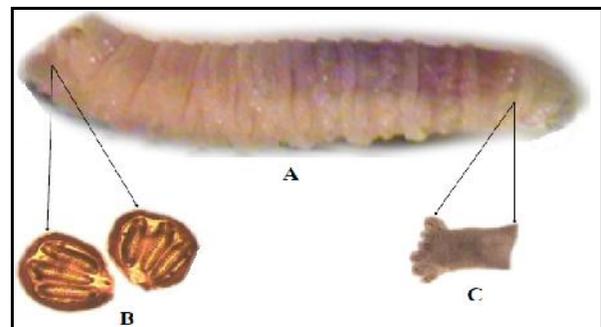


Fig. 2. (A) The full grown third-instar larvae of *Chrysomya bezziana*, (B) posterior and anterior (C) spiracles (Original photo)

Discussion

Human myiasis is a rare condition in any part of the world, but is more common in the regions with a warm and humid climate. The Old World screwworm, *C. bezziana*, is a major agent of traumatic myiasis throughout the tropical regions of the Old World (Spradbery 1994).

Chrysomya bezziana occurs throughout tropical Africa, Indian subcontinent, in most of the south-east Asia to China, and the Philippines to Papua New Guinea (Goddard 1996). It also has been introduced to several countries on the coast of Persian-Gulf, including Iran (Jdalayer et al. 1978, Tirgarie et al. 2003, Soleimani Ahmadi et al. 2009, Faramarzi et al. 2009, Khataminia et al. 2011), Iraq (Abdul Rassoul et al. 1996, Siddig et al. 2005), Saudi Arabia (Ansari and Oertley 1982, Alahmed 2002), Oman (Spradbery et al. 1992, Hall et al. 2005), Bahrain (Siddig et al. 2005) and United Arab Emirates (Spradbery and Kirt 1992).

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 and dryness (Sutherst et al. 1989). The tropical climate of south of Iran is a factor that is suitable for growing flies. In this area the incidence of myiasis was generally low and seasonal, with most of cases reported during cooler seasons of the year when there is occasional rainfall (Soleimani Ahmadi et al. 2009).

Myiasis has become increasingly prevalent, particularly when human activity is carried out in environments with poor hygiene or near to domestic animals (Romero-Cabello et al. 2010).

Open wounds and body orifices that emit odors of natural secretions are major factors in susceptibility to myiasis, as they provide a favorable environment for the attraction and

oviposition of flies (Batista-da-Silva et al. 2011).

One major problem in myiasis is the potential transfer of bacterial pathogens. In general, larvae causing myiasis have been demonstrated to carry a broad spectrum of bacteria (Sesterhenn et al. 2008).

A reason for acquiring this rare myiasis infestation was that the patient had open wound which emits odors attractive for *C. bezziana* and stimulates the female insects to deposit eggs. Another reason is that, our case lived near to livestock in rural area which provides suitable condition for occurrence of *C. bezziana*. Moreover, poor personal hygiene and the lack of self-care ability might have played the role as predisposing factors for myiasis infestation.

Prevention of human wound myiasis involves control of fly populations and personal hygiene. Window screens, mosquito nets, repellents, and insecticides can be used for controlling the fly populations and prevention of flies from entering houses and hospitals. In addition, prevention of this disease is accomplished by proper dressing of wound and, considering the wound hygiene.

Recently, human cases of myiasis caused by the Old World screwworm fly, *C. Bezziana* in south and southeast of Iran have been increased (Faramarzi et al. 2009, Khataminia et al. 2011). This study also confirmed *C. bezziana* as a causative agent of human wound myiasis in the south of Iran. Therefore, increasing awareness of medical personnel about clinical symptoms and pro-per diagnosis and treatment of disease is necessary.

Acknowledgements

The authors would like to appreciate the personnel of Pediatric Hospital of Bandar Abbas for providing the larval samples. The

authors declare that they have no conflicts of interest.

References

- Abdul Rassoul MS, Ali HA, Jassim FA (1996) Notes on *Chrysomya bezziana* Villeneuve (Diptera: Calliphoridae), first recorded from Iraq. Bull Iraq Nat Hist Mus. 8: 113–115.
- Alahmed AM (2002) Incidence of myiasis in sheep caused by *Chrysomya bezziana* in Saudi Arabia. J Kin Saud Uni Agric Sci. 14: 109–112.
- Ansari MA, Oertley RE (1982) Nasal myiasis due to Bezzi's blowfly (screwworm): case report. Saud Med J. 3: 275–278.
- Batista-da-Silva JA, Borja GE, Queiroz MM (2011) Patient with tracheostomy parasitized in hospital by larvae of the screwworm, *Cochliomyia hominivorax*. J Insect Sci. 11: 163.
- Davami MH, Kiani A, Salimi M, Farhadi E (2005) Case report: myiasis of scalp due to *Chrysomya bezziana*. Iran J Dermatol. 8: 311–315 (Persian with English abstract).
- Faramarzi A, Rasekhi AR, Kalantari M, Hatam GR (2009) *Chrysomya bezziana* as a causative agent of human myiasis in Fars Province, southern Iran. Iran J Arthropod-Borne Dis. 3: 60–63
- Goddard J (1996) Flies whose maggots cause myiasis in humans. In: Physician's Guide to Arthropods of Medical Importance. 2nd ed. CRC Press. Florida. pp. 169–187.
- Hall MJ, Wardhana AH, Shahhosseini G, Adams ZJ, Ready PD (2009) Genetic diversity of populations of Old World screwworm fly, *Chrysomya bezziana*, causing traumatic myiasis of livestock in the Gulf region and implications for control by sterile insect technique. Med Vet Entomol. 23(Suppl 1): 51–58.
- Jdalayer T, Maleki M, Moghtaderi M (1978) Human urogenital myiasis caused by *Chrysomya bezziana*. Iran J Publ Health. 7: 116–119.
- Khataminia G, Aghajanzadeh R, Vazirianzadeh B, Rahdar M (2011) Orbital myiasis. J Ophthalmic Vis Res. 6: 199–203.
- McGraw TA, Turiansky GW (2008) Cutaneous myiasis. J Am Acad Dermatol. 58: 907–926.
- Ng KH, Yip KT, Choi CH, Yeung KH, Auyeung TW, Tsang AC, Chow L, Que TL (2003) A case of oral myiasis due to *Chrysomya bezziana*. Hong Kong Med J. 9: 454–456.
- Robbins K, Khachemoune A (2010) Cutaneous myiasis: a review of the common types of myiasis. Int J Dermatol. 49: 1092–1098.
- Romero-Cabello R, Calderón-Romero L, Sánchez-Vega JT, Tay J, Romero-Feregrino R (2010) Cutaneous myiasis caused by *Chrysomya bezziana* larvae, Mexico. Emerg Infect Dis. 16(12): 2014–2015.
- Sesterhenn AM, Pfützner W, Bräulke DM, Wiegand S, Werner JA, Taubert A (2008) Cutaneous manifestation of myiasis in malignant wounds of the head and neck. Eur J Dermatol. 19: 64–68.
- Sherman RA, Hall MJ, Thomas S (2000) Medicinal maggots: an ancient remedy for some contemporary afflictions. Annu Rev Entomol. 4: 55–81.
- Siddig A, Al Jowary S, Al Izzi M, Hopkins J, Hall MJ, Slingenbergh J (2005) Seasonality of Old World screwworm myiasis in the Mesopotamia valley in Iraq. Med Vet Entomol. 19: 140–150.
- Soleimani Ahmadi M, Nasirian H, Nazemi Ghesmi Am, Yaghoobi-Ershadi MR (2009) Human extensive head Skin myiasis. Iran J Publ Health. 38: 134–138.

- Spradbery JP (1994) Screw worm fly: a tale of two species. *Agric Zool Rev.* 6: 1–62.
- Spradbery JP, Khanfar KA, Harpham D (1992) Myiasis in the Sultanate of Oman. *Vet Rec.* 131: 76–77.
- Spradbery JP, Kirk J (1992). Incidence of Old World screw-worm flies in the United Arab Emirates. *Vet Rec.* 130: 133.
- Sutherst RW, Spradbery JP, Maywald GF (1989) The potential geographical distribution of the Old World screw-worm fly, *Chrysomya bezziana*. *Med Vet Entomol.* 3: 273–280.
- Tirgari S, Nateghpour M, Jahanian AH, Akbarzadeh K (2003) First record of Human myiasis caused by *Chrysomya bezzinana* (Villeneuve) in Iran (Diptera: Calliphoridae). *Iran J Publ Health.* 32: 68–70.
- Zumpt F (1995) Myiasis in Man and Animals in the Old World. Butterworths, London.