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# Human ophthalmomyiasis externa caused by the sheep botfly *Oestrus ovis*: a case report from Karachi, Pakistan

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## PEER REVIEW

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## Comments

The authors addressed a new data related to the ophthalmomyiasis externa caused by *O. ovis*. Authors revealed that the ophthalmomyiasis externa can occur at any season of the year. Moreover, it can occur in any area either rural or urban with or without exposure to farm animals.

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## ABSTRACT

Ocular myiasis due to *Oestrus ovis* larvae infestation is an eye infection in humans. A case of ophthalmomyiasis externa in a young male from Karachi, Pakistan in winter (December 2012), without history of close proximity to domestic animals or visit to any rural area was reported. The condition is self-limiting and the disease is confined to the conjunctiva. The eye was locally anesthetized and washed with 5% povidine iodine solution. A total number of 27 first instar larvae of *Oestrus ovis* were removed with fine forceps. The patient received 0.5% moxifloxacin and diclofenac eye drops for one week. His eye was examined after one day, one week and one month and the recovery status was favorable. The present case raise the awareness among ophthalmologists regarding larval conjunctivitis as one of the causes of conjunctivitis and it can occur throughout the year in any season including winter. Moreover, it can occur in any area either rural or urban with or without close proximity to domestic animals especially in subtropical regions with high parasitic burden.

## KEYWORDS

Ophthalmomyiasis externa, *Oestrus ovis*, Pakistan, Eye infections

## 1. Introduction

Ophthalmomyiasis is a rare parasitic eye infestation in humans. It is a rare manifestation in humans, with ocular involvement occurring in <5% of all cases of human myiasis. Ophthalmomyiasis is classified as ophthalmomyiasis externa if the larvae are present on the conjunctiva, and ophthalmomyiasis interna when there is intraocular penetration of larvae[1]. Ophthalmomyiasis externa is mainly caused by the sheep botfly *Oestrus ovis* (*O. ovis*); therefore, it is usually seen in rural areas or where proximity to small

ruminants is common[2]. Cases of ophthalmomyiasis externa have been reported from different parts of the world[1–4]. However, this condition is rare in Pakistan and only single case report with two cases is reported from Sind, Pakistan[5]. We report herein a case of ophthalmomyiasis externa in a young male from Karachi, Pakistan. Pakistan is a subtropical country and Karachi is a big city, located on the coast and as a result humidity remains high throughout the year. It has two main seasons, summer and winter, but summer persists for longest period during the year. Its climate is favorable for the parasite growth and survival[6], but no data

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on distribution of *O. ovis* is available from Pakistan.

## 2. Case report

A 33-year-old male, resident of Karachi, presented to the eye clinic in Bismillah Taqi Hospital on 12th December 2012 with a one-day history of redness and irritation in his left eye. He had no oculopathy before. He did not report neither recent presence near domestic animals nor visit to any rural area during the past 6 months. One day before his visit, he felt that something had hit his left eye while standing under a tree on roadside. The ophthalmological examination showed that his visual acuity was not affected but the conjunctiva of his left eye was mildly congested with profuse lacrimation. On slit lamp examination, a white object of 1 mm length crawling over the conjunctiva were seen with no other anomaly. After local anesthesia, the eye was washed with 5% povidine iodine solution, 27 larvae were removed with a fine forceps. The larvae were mounted on a microscopic slide and examined under a microscope at 400× magnification, they were identified as the first instar larvae of *O. ovis* since they present a pair of sharp, dark brown oral hooks connected to the internal cephalo pharyngeal skeleton and multiple spiny projections along with a spindle shaped skeleton (Figure 1). The posterior spiracle consists of two lobes with approximately 9–10 chitin-like spines on each lobe. The patient was treated with topical application of moxifloxacin (0.5%) eye drops thrice daily and diclofenac eye drops four times a day, for 1 week. Follow up was done the next day, after 1 week and 1 month. On follow up he was completely asymptomatic and no more larvae were seen.



**Figure 1.** Wet preparation of first-instar larva of *O. ovis* demonstrating oral hooks connected to the internal cephalopharyngeal skeleton and multiple spiny projections (400×).

## 3. Discussion

*O. ovis* is a member of the Oestridae family which is a large family of obligate parasites of animals in their larval stage causing myiasis. The sheep botfly *O. ovis* is a typical parasite of small ruminants at larval stages. The natural cycle begins in summer, when the gravid female fly ejects first-instar larvae around their hosts' nostrils directly or by dropping the fertilized eggs during flight, from a height of 0.5 m. The larvae migrate to the paranasal sinuses, where they mature by feeding on mucous detritus. Once their development has finished, the maggots return to the nasal cavity, from where they are evacuated and fall to the ground, transforming into pupae[6]. Humans are accidental hosts. However, the tiny larvae do not develop any further in human eye beyond the first larval instar[6].

Human ophthalmomyiasis due to *O. ovis* is not new but in Pakistan has been unfruitful. Several such cases have been reported from different parts of the world[1–4]. Mostly affected are shepherds and farmers from rural areas. A case series from Turkey reported that all ten patients with ophthalmomyiasis externa lived in a place where sheep fed[1]. Another case series from India, reported that all the patients were farmers living in rural areas and worked in close contact with sheep and goats[2]. Moreover, Ali *et al.* reported two cases of ophthalmomyiasis externa from Southern Sindh, Pakistan. Both of the patients come from rural areas[5]. An interesting case of oral myiasis with *O. ovis* was also reported from a child from rural area of Northwest Iran[7]. However as the present case findings, three cases from Spain were reported from urban area with no direct exposure to animals[3]. Males are mostly affected by this parasite. Eleven cases from Tunisia were reported in males[4]. In India, eight out of ten were male and in previous report from Pakistan both sufferers were males[2,5].

Another interesting finding is that the present case occurred in December, all the other human cases were reported in summer and autumn even the previously reported cases from Pakistan[1–4]. Occurrence of present case in winter is suggesting the high rate of parasitic infestation in small ruminants in all four seasons. Though no information about the life cycle and distribution of this parasite is available in Pakistan, maybe high temperature and humidity supports its growth throughout the year. A study from Turkey also found high prevalence rate of parasitic infestation in sheep, in all four seasons of the year[8].

Like the present case, classic history includes a fly colliding with the eye, followed immediately by pain, burning, lacrimation, foreign body sensation and subsequent development of edema[1–4]. However, cases may occur without any prior exposure to flies. In a case series from Turkey four out of ten had no history of fly exposure[1]. Misdiagnosis is

common, with attribution of the acute conjunctivitis to other causes<sup>[1]</sup>. Slit lamp examination is crucial for picking up the larvae.

The topical anesthesia helps in extraction process by immobilizing the eye and decreasing patients' reactions. Systematic antiparasitic prescription is not needed; the mechanical removal of the larvae using forceps, a cotton bud extraction or saline irrigation is effective<sup>[1–4]</sup>. The prescription of corticosteroids/nonsteroidal anti-inflammatory drugs and topical antibiotics are recommended to relieve the pain and inflammation and to prevent secondary bacterial infections respectively<sup>[1–4]</sup>. Though prognosis is good, threatening complications with retinal detachment and panuveitis have been reported<sup>[9]</sup>. These may be avoided through prompt diagnosis and early treatment, which is possible only if proper slit lamp examination is performed. It is also recommended that to control human infections, there is an urgent need of evaluation of distribution and epidemiology of parasite infestation in small ruminants in Pakistan.

### Conflict of interest statement

We declare that we have no conflict of interest.

### Comments

#### Background

Myiasis is infection of tissues or organs of animals or man by larvae of a fly. Ocular involvement occurs in about <5% of all cases of human myiasis. Ophthalmomyiasis is classified as ophthalmomyiasis externa if the larvae are present on the conjunctiva and ophthalmomyiasis interna when there is intraocular penetration of larvae. Cases of ophthalmomyiasis externa have been reported from various parts of the world. Myiasis in man is generally rare, it is seen in places where the standard of hygiene is low and there is abundance of flies around the locality.

#### Research frontiers

The present study reports a case of Ophthalmomyiasis externa caused by the sheep botfly *O. ovis* from Karachi, Pakistan.

#### Related reports

There are many reports related to this paper such as reports by Azam Ali, et al. (2006), Anita Pandey, et al. (2009), Mahesh Kumar Shankar, et al. (2012), Grammer J, et al. (1995) and Gregory AR, et al. (2004).

#### Innovations and breakthroughs

The present paper reports a new case of ophthalmomyiasis

externa caused by *O. ovis* in a young man from Karachi, Pakistan without exposure to farm animals or rural areas. Also the case had been occurred in December but literature suggested increased prevalence of *O. ovis* in summer and autumn.

#### Applications

It is good to know that the ophthalmomyiasis externa caused by *O. ovis* can occur at any season of the year. This work creates awareness among the ophthalmologists regarding larval conjunctivitis as one of the causes of conjunctivitis.

#### Peer review

The authors addressed a new data related to the ophthalmomyiasis externa caused by *O. ovis*. Authors revealed that the ophthalmomyiasis externa can occur at any season of the year. Moreover, it can occur in any area either rural or urban with or without exposure to farm animals.

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