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INTESTINAL MYIASIS CAUSED BY *MUSCINA STABULANS*

Intestinal maggots were isolated from a patient, who had reported to the Department of General Medicine of Sri Manakula Vinayagar Medical College, Puducherry, in southern India with complaints of abdominal distress, bloating of abdomen and intestinal hurry following a meal. He was diagnosed as a case of intestinal myiasis. Maggots obtained from his stool were identified to be *Muscina stabulans* based on characteristic patterns of posterior spiracles. He was treated with purgatives and albendazole. This intestinal myiasis case caused by *M. stabulans* is reported here because of its rare occurrence and the need to establish a correct diagnosis.

Key words: *Albendazole, intestinal myiasis, Muscina stabulans*

Myiasis is an infestation of live human or vertebrate animals with dipterous fly larvae, which at least for a certain period of their life, feed on dead or living tissues or ingested food of their hosts.^[1] This condition is common throughout the tropics.^[2] Over 50 fly species have been reported to cause myiasis among humans.^[3] Severity of myiasis depends on the location of the infestation.^[2] Myiasis infestation can occur in anatomical sites, including skin, eye, ear, nasopharynx, genitourinary tract, intestine and in wounds.^[3] Cases of intestinal myiasis due to *Musca domestica*^[4] and *Eristalis tenax*^[5] have already been reported from the Indian subcontinent. In intestinal myiasis, even a healthy person is affected, when he consumes contaminated food or drink. The eggs or larvae previously deposited on food, upon ingestion may survive the digestive enzymes of gastrointestinal tract and develop further and cause enteritis. This infestation can be asymptomatic or present with vague abdominal pain, vomiting, diarrhoea, loss of appetite and weight.^[6] In the present communication, a case of intestinal myiasis due to *Muscina stabulans* (Diptera: Muscidae) in India, in a male patient residing in a rural area is reported.

Case Report

A 20-year-old male patient, belonging to a socio-economically poor family, residing in a rural village of Villupuram district in Tamil Nadu, reported to the outpatient department of General Medicine of Sri Manakula Vinayagar Medical College and Hospital, Puducherry. He had presented

with complaints of abdominal distress, bloating of abdomen and intestinal hurry following a meal. He also had the history of loose stool, generalized malaise and passing worms in stool on and off, and loss of about 5 kg of weight, over a period of two years.

On examination, he was apparently normal and examination of blood showed that TLC, DLC, ESR and Hb were within normal limits. A fresh stool sample was submitted to the Microbiology Laboratory. The sample was watery with scanty faecal matter but with numerous maggots. A repeat fresh sample collected on the same day within two hours after hospitalization, also confirmed the presence of maggots. He was diagnosed as a case of intestinal myiasis. The maggots were isolated from his stools, washed in normal saline (0.9%) and again in distilled water and then preserved in formalin (10%) and submitted to the Vector Control Research Centre (VCRC), Puducherry for identification of the species. At Vector Control Research Centre, the maggots were washed in distilled water again and soaked in 10% sodium hydroxide for six hours. The last segment of the maggot was cut and the spiracular plate was dissected under a Zeiss binocular dissection microscope and mounted in Hoyer's medium and kept over a hot plate for clearing for two days. Photographs of the whole larva and the spiracular plate were taken using MOTIC BA 300 digital compound microscope fitted with camera and identified using a standard key.^[7] The patient visited the hospital after six months and he was found to be normal.

Results

The maggots were dull white in colour and measured 6-7 mm in length and 1-1.5 mm in width. Body was covered with tough integument, having bands of greyish-brown minute spines. On microscopic examination, the bodies of the maggots consisted of 11 apparent segments. Each segment had a belt of well-developed minute spines towards its posterior margin, except the anal segment, which had frontal concavity (Fig. 1). Both anterior and posterior ends of



Figure 1: *Muscina stabulans* maggot obtained from a case of intestinal myiasis and preserved in formalin (10%) ($\times 50$)

the maggots were rather narrow, while broad in the middle. The anterior pseudo-cephalic segment had two prominent oral hooks, which enable the maggots to firmly attach to the intestinal mucosa. The posterior segment had a fossa within which was located a pair of spiracles, which are respiratory in function. The peritreme of posterior spiracle consisted of a solid plate, having spiracular slits, which were more or less tortuous or arcuate and divergent from one another, showing the characteristics of the genus *Muscina*. Larvae with two slits or two simple openings at the posterior spiracles denoted that they were in the second instar stage. A curve in the spiracular slit at the middle confirmed the species *stabulans* (Fig. 2). The maggots isolated from the patient have been identified to be *Muscina stabulans*.^[7]

Discussion

Intestinal myiasis in humans is probably an accidental myiasis related to ingestion of contaminated and/or uncooked food or water containing eggs or larvae of flies. Most larvae are destroyed by the digestive enzymes, but others are able to live in the intestinal tract and produce intestinal distress.



Figure 2: Posterior spiracle of *Muscina stabulans* maggot obtained from a case of intestinal myiasis mounted in Hoyer's medium ($\times 400$)

Larvae of certain species of flies can also exceptionally reach the intestinal tract through the anus leading to rectal myiasis. In urban areas of developed countries, cases of intestinal myiasis are rare; most have occurred in countries where nutritional and sanitary conditions are unsatisfactory.^[5] *Eristalis tenax* is the most-common species involved in intestinal myiasis and has a worldwide distribution.^[5,8] Besides, the involvement of *M. domestica*^[4] in India,^[5] *E. tenax* in Europe^[8] and Japan^[9] in causing intestinal myiasis has been known. Clinical presentation of these cases has been reported to vary with the geographical location, including asymptomatic cases, abdominal pain, nausea, vomiting or anal pruritus.^[8,9] In the present study, the patient presented with abdominal symptoms and generalized symptoms of loss of appetite and weight.

The finding of fly larvae in stool specimens does not necessarily denote intestinal myiasis. Many species of fly larvae that might be accidentally ingested with food cannot survive in the gastrointestinal environment. In such cases, although the dead larvae may be recognized on subsequent stool examinations, true host infestation is never established and the condition is properly termed pseudomyiasis.^[10] However, in the case of *M. stabulans*, the larvae survive the gastric juice and live larvae have been recovered from fresh stool sample of our patient indicating that it is a case of true intestinal myiasis. The female flies of *M. stabulans* frequently oviposit from 140-200 eggs on food or decaying matter.^[5] These eggs develop through three larval stages before pupation. The larvae developed inside the intestinal tract upon maturation for pupation drop to the ground, while the patient defecates.^[5] The larval development is temperature-dependent and requires 10-20 days.^[2]

Even though no effective chemotherapeutic agents are available for the treatment of intestinal myiasis,^[2] treatment with purgatives and albendazole has been found to be effective in the present case. The patient presented here reported relief of symptoms following treatment with albendazole. The role of albendazole should, however, be evaluated by further studies. A high index of suspicion and

proper diagnosis is essential to avoid unnecessary treatment. Intestinal myiasis can easily be prevented by protecting the foodstuff from contamination with the eggs or larvae of dipterous flies. Thorough washing of fruits and vegetables and adequate cooking of food before consumption offer better protection. The need for correct diagnosis of myiasis, which is potentially destructive, needs to be emphasized.

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