

## CLINICAL NOTES

## Myiasis in Leprosy

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Infestation of ulcers and invasion of nasal cavities of leprosy-affected persons by larvae of different flies is still seen in some patients today. Leprosy-affected persons, whether active or released from control, having residual problems like atrophic rhinitis or anesthesia of the hands and feet can acquire maggot infestations especially if they are from economically weaker strata of society, have poor hygiene, suffer from general debility and have poor near vision.

The term myiasis is derived from Greek word "Myia" meaning a fly. Infestation of living tissues by larvae of dipterans flies is called myiasis, and Goldstein<sup>(2)</sup> was probably the first to report myiasis in human beings. The flies responsible for myiasis are grouped as obligatory, facultative and accidental parasites depending upon the ovi or larvipositing habits of the flies. Common genera causing myiasis in humans are *Sarcophaga*, *Chrysomya*, *Lucilla*, and *Calliphora*. Occasionally common house flies (belonging to genus *Musca*) are also responsible for accidental myiasis. Based upon the affected organ, myiasis can also be classified as nasal, aural, ocular, anal, vaginal etc. Animal myiasis is well known. Human tissue myiasis involving the skin has been reported from Mexico, the Middle East, North Africa and the United States of America, but few documented reports are available<sup>(3,7)</sup>.

The maggots of certain dipterans flies are merely scavengers and are sometimes found to be beneficial. These surgical maggots are said to help in healing wounds<sup>(9,10)</sup>. However it is difficult to predict cir-

cumstances under which they act as scavengers or as a serious parasite. It has been observed that once the wounds of the extremities are cleared of maggots they granulate faster. This has been attributed to the presence of allantoin which is excreted by maggots into the wound<sup>(11)</sup>.

Myiasis is more commonly seen in the tropics and subtropics where flies are present in abundance. These are the areas of the world where leprosy also exists. Myiasis causes distress, pain and increases tissue damage. Myiasis is a serious problem when it occurs, although Sreevatsa, *et al.*<sup>(12)</sup> found the incidence to be less than 0.5% in 3350 consecutive cases of leprosy of all types. Either sex can be affected but there has been a male predominance, probably due their involvement in outdoor activities. Poor personal hygiene as well as environmental conditions increase the risk of myiasis. Cases are more frequent during September to November—the post monsoon season (mean temperatures around 25° Celsius and humidity 80–90%)—a favorable period for flies to breed.

Reports in the literature about tissue myiasis are scanty; only nasal myiasis been extensively studied. The loss of capability to perceive sensory stimuli contributes significantly to such infestations. Atrophic rhinitis in BL-LL cases predisposes to nasal invasion, and 60–70 % of lepromatous cases have ulcers of nasal mucosa during the course of illness<sup>(1)</sup>. The suppurative wounds of the nasal cavity and the resulting muco-purulent discharge provide an attractive and rather secure site for flies to breed. It is likely that flies lay their eggs in the vicinity of nostrils; eggs are subsequently pushed inside while wiping the nose. Larvipositing flies lay their larvae in the vicinity and they subsequently migrate into the nasal cavity—a darker area.

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Wounds and ulcers in extremities, for various reasons, are seen in 15–20% cases of all types leprosy<sup>(13)</sup>. Infected suppurating wounds in these anatomical areas provide a congenial atmosphere for the flies to lay their eggs/larvae, and for larvae to grow and develop further. These larvae burrow deep into the wounds and damage tissues further.

**Clinical presentation of myiasis.** Infestations of the nose and extremities produce several symptoms, some of which are common. Patients may have recurrent infestations, especially in nose. Nasal myiasis, usually seen in lepromatous (LL) and borderline lepromatous (BL) cases, gives rise to a feeling of uneasiness, nasal stuffiness and obstruction, headache, irritation, gnawing and/or insect crawling sensations in the nose, and sneezing. Associated features are blood-tinged nasal discharge or frank epistaxis, swelling of the nose and nearby facial structures, and at times “insects” (maggots) dropping out of the nose, either spontaneously or on blowing the nose. Patients may appear to be disinterested and apathetic but are in severe agony.

Sometimes tissue destruction is extensive and can lead to nasal perforation and other nasal deformities such as collapse of nasal architecture, partial absorption of nasal bones, and deviation of the nasal septum<sup>(4)</sup>. Nasal perforation may result in a nasal fistula when edema subsides and tissues begin healing. Occasionally the larvae burrow deep into the floor of the nasal cavity and erode the bony palate to produce a palatal perforation which may result in a permanent palatal fistula. These fistulae are difficult to treat because of intense fibrosis in the surrounding areas<sup>(8)</sup>. Nasal myiasis can prove fatal if cavernous sinus thrombosis develops or the floor of the cranium is invaded. Many of the patients affected with nasal myiasis keep moustaches which, if not cleaned properly, can attract flies. The nasal discharges and food adhering to the hairs in moustaches and drying up, is again a source of attraction to flies.

Patients having ulcers of the extremities complain of a feeling of insects crawling in areas around the wound, foul smelling discharge, swelling and “insects” in the wound. Many times patients try to treat their wounds themselves with available “insecticides” before presenting for treatment.

The bacterial flora seen in maggot-infested wounds of the extremities is mixed<sup>(6)</sup>. Among gram-positive aerobes, *Staphylococcus aureus*, *Staphylococcus albus* and *Streptococcus pyogenes* were more frequently isolated; gram-negative aerobes included *Proteus* spp. and *Escherichia coli*. Anaerobes which were isolated include *Micrococcus* and *Bacteroids* whereas *Clostridia* were seen infrequently (2% cases). Even after removal of maggots, *Staphylococcus aureus* persisted in the wound, though gram negative bacteria and anaerobes were dramatically reduced. These observations revealed only the spectrum of bacteria but not the quantum of bacterial load in maggot infested wounds.

Sreevatsa, *et al.*<sup>(12)</sup> were able to culture the larvae obtained from the nose and wounds in laboratory and found that two flies were mainly involved—*Sarcophaga ruficornis* and *Chrysomya bezziana*. Husain, *et al.*<sup>(5)</sup> in another study found *Sarcophaga haemorrhoidalis*, *Chrysomya bezziana*, *Callitroga americana* and *Musca domestica* infested the nose and wounds of the extremities in leprosy affected persons. The former two were more frequent, and at times two or more species were infesting the same wound.

**Management of myiasis.** The goal of management is to remove maggots as fast as one can, kill them to prevent maturation, promote wound healing and prevent secondary complications. Myiasis of the nose and that of the extremities require different approaches.

Wounds of the extremities are washed with pure chloroform (Pharmacopoeia grade). About 5 to 10 ml is enough for an average size wound. Chloroform kills the maggots instantaneously<sup>(5)</sup> and is innocuous to the tissues. It must be stored in amber colored bottles away from sunlight because it decomposes in presence of sunlight to form a toxic product. It is better than ether (used in some clinics) which is more volatile and irritating and has a local freezing effect.

Dead maggots can be manually removed or the wound can be lightly curetted, taking special care to remove maggots from under wound margins. Since maggots have a tendency to migrate quickly towards deep and darker areas, it is better to organize materials before opening the dressings. Wound

debridement in the extremities should be limited to the essential minimum because the wound rapidly granulates and healing is faster if general debility is not severe. The wound is then dressed with fluffed gauze soaked in a mixture of turpentine and water (1:10). This keeps the flies away, masks the bad odor and absorbs the discharges. Dressing changes are made after 24 hours and the wound is treated similarly removing dead tissues; additional chloroform treatment may be needed if some live maggots remain. The wound is usually free of maggots by the second or third day and then can be treated like any other infected wound.

For nasal myiasis, the nasal cavity is copiously irrigated with a mixture of chloroform and water (1:2) two to three times a day and then is lightly packed with a ribbon gauze soaked in a mixture of turpentine and liquid paraffin (1:15). The process is repeated until the nasal discharge subsides. Dead maggots are coughed out mixed with discharges. The patient should be advised to instill nasal drops made of turpentine oil and liquid paraffin (1:20). Deep posterior burrowing of maggots makes their manual removal difficult. Patients are prescribed antibiotics and aspirin in suitable doses to control infection and prevent intracranial complications (i.e., cavernous sinus thrombosis). Patients are also given sedatives such as diazepam to reduce discomfort. The nasal cavity is usually free of maggots in 48–72 hours after starting treatment, and local cellulitis subsides in 7 to 10 days. Nasal myiasis usually does not require any surgical intervention except in cases where tissue destruction is extensive and nasal structures have been destroyed by maggots. There also the tissue excision should be done conservatively. Incisions on the nose to attempt manual removal of maggots should be avoided. In patients having recurrent infestations, partial closure of the nostrils using local mucosal flaps can be performed<sup>(14)</sup>.

Myiasis is an avoidable problem. It can be prevented by proper ulcer care and by preventing flies from settling on ulcers by keeping the wounds well covered with

dressings and by painting the top-most layer with a turpentine water mixture (1:5), especially during the post monsoon season when flies tend to breed. To prevent nasal myiasis patients need to be educated about routine nasal care and hygiene.

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