Case Series

Managing Maggots in the Eye: A Case Series

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ABSTRACT

Purpose: To describe the presentation and management of ocular maggots and to identify the factors contributing to their occurrence.

Study Design: Retrospective case series.

Place and Duration of Study: Department of Ophthalmology Mayo Hospital Lahore from 2015 to 2022.

Methods: The study involved retrospective chart analysis of patients who presented with Ophthalmomyasis and managed in the eye department. Data regarding age, gender, occupation, clinical findings, co-morbidities, associations and environmental factors were analyzed. Larvae were removed one by one under microscope. Follow up was done after 1 week, 1 month and 3 months. In patients with orbital myasis having distorted, large ulcerated wounds/socket, turpentine oil was used and larvae were removed mechanically under microscope.

Results: There were 15 fifteen patients included in the study. Underlying co-morbidities were present in 60% patients and the most common being basal cell carcinoma (46.6%). Seventy four percent patients had some systemic disease; Diabetes Mellitus, Hypertension, AIDS, Hepatitis C etc. One third patients had external ophthalmo-myasis while two third had orbital myasis. Patients who did not complete follow-up were 33%. Use of suffocating agents like turpentine oil, periodic removal of larvae, topical and systemic antibiotics, topical lavage with copious irrigation with sterile fluids resulted in good outcome in all cases that completed the follow up.

Conclusion: The majority of patients came from rural communities and had underlying co-morbidities. Timely management resulted in good outcomes for all patients who completed the follow-up, highlighting the importance of comprehensive and sustained treatment protocols.

Key Words: Myasis, Ophthalmomyasis, Maggots, Larva, house flies, orbit.

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INTRODUCTION

Myasis is the infestation of flies' larvae(maggots) in living or dead tissues of human body and animals. Ophthalmo-myasis is a rare infestation of flies' larvae on human eyes. It has been reported to be less than 5% of all human myasis.[1,2] In the external type; larvae are present on eyelids or conjunctiva. External Ophthalmomyasis is less damaging but can occasionally result in severe complications such as corneal ulcer, iridocyclitis, globe invasion and necrosis, endophthalmitis or even blindness.[3] Internal Ophthalmomyasis is caused by invading larvae and can occasionally be seen in vitreous cavity or in sub-retinal space and can lead to blindness. There are three families of parasite that can result in Ophthalmomyasis. Most common cause is the larvae of sheep nose botfly (Oestrus Ovis) that belongs to family of Oestridae.[3,4] All these flies are oviparous and eject their eggs on necrotic dead tissue, which hatch to form maggots. Domestic animals such as sheep, buffalos and goats are the natural hosts of these larvae, while humans are the accidental hosts.[6]

The life cycle of Oestrus Ovis begins in summer, when the gravid female ejects its first instar larva

around their host's nostrils.[7] The larvae migrate to the paranasal sinuses where they feed on mucous detritus. Once development has finished, the maggots return to the nasal cavity where they evacuate.[8,9]

Maggots' infestation is common in developing countries and very rare in developed countries. Its occurrence is related to over-crowding, poor hygienic conditions, and underlying co-morbidities.[10] Pakistan is a subtropical country. This climate is favorable for the parasite growth and survival, but very few cases have also been reported in literature.[11,12] Though it is rare condition but our ophthalmologists working at tertiary care facilities, at times come across these cases.

The purpose of this study was to create awareness in health care providers about the presentation and management of maggots in eyes. It will also help us to find the association between the occurrence of maggots and promoting factors.

METHODS

This is a retrospective descriptive case series study. Approval was sought from the Institutional Review Board assuring that informed consent was taken from every patient/guardian at the time of examination. The study was done according to the Declaration of Helsinki. It was conducted in Mayo Hospital Lahore, over a period of 7 years, from January 2015 to December 2022. Patients of either gender, any age, who presented with Ophthalmomyasis and managed in eye department were included. We analyzed their detailed history, demographic characteristics like age, gender, occupation, clinical findings, co-morbidities, associations and environmental factors. Data were recorded on specially designed proforma.

In external Ophthalmomyasis, slit lamp examination revealed white mobile larvae in their fornices/caruncle/conjunctiva. While patients with orbital myasis had maggots over ulcerated wounds or in post-exenteration socket they were visible even with naked eye.

Under aseptic measures and dim light conditions, topical anesthetic drops (Alcain USA) were instilled in patients with external Ophthalmomyasis that immobilized the larvae. Larvae were then removed one by one under microscope. Antibiotic and steroid combination eye drops/ointment were prescribed to the patients and were called on follow up after 1 week, 1 month and 3 months.

In patients with orbital myasis having distorted, large ulcerated wounds/socket, turpentine oil was used. After instillation of turpentine oil, larvae were removed mechanically under microscope by forceps. Turpentine oil (or Maggot oil) was used without dilution. In some patients, larvae were difficult to be removed as they burrowed deeply in fornices or wound. The same process was repeated until all maggots were removed. These patients were admitted in eye ward as they required longer treatment along with systemic antibiotics and surgical management. After discharge, they were followed up at 1 week, 1 month and 3 months.

RESULTS

Record of 15 patients with Ophthalmomyasis was retrieved. Mean age was 62.4 years (range of 34-85). Four out of fifteen were females (26.65%) and eleven patients were males (73.4%). All patients belonged to rural areas. Three patients were shepherd (20%) while two were farmers (13.3%) by profession. Sixty percent (60%) patients had some underlying ocular/peri-ocular disease. Seven patients had basal cell carcinoma (46.6%), one patient had squamous cell carcinoma (6.6%), and one patient had post-exenteration socket (6.6%). Only four patients did not have any co-morbidity (26.6%) while 73.4% patients had one or more than one systemic illness. Diabetes mellitus was present in 8 patients (53.3%), hypertension in five patients (33.3%), hepatitis C in three patients (20%), HIV in four patients (26.6%), and two patients were intravenous drug abusers (13.3%).

External ophthalmo-myasis was seen in 5 patients (33.3%) while orbital myasis was seen in ten patients (66.6%). Out of 15, 1/3rd patients (33.3%) did not complete follow up.

DISCUSSION

Patients in this particular study belonged to rural areas. They were in close proximity to small ruminants or were shepherds that indicate the likelihood of causation of Ophthalmomyasis. A similar study on Ophthalmomyiasis in Libya stated that the residents of rural areas were more affected than those of urban areas.[13]

In a case series from Turkey, all ten patients with external Ophthalmomyiasis lived in areas where sheep were grazed.[14] In our study, 20% of the patients were

shepherds by profession. Similarly, a case series from India reported that all patients with Ophthalmomyiasis were either farmers or lived in areas with close proximity to sheep and goats.[15] In our study, however, only two patients were farmers. This discrepancy might be attributed to the presence of other comorbidities and underlying diseases in the patients of our study.

Other important environmental factors noticed during the study were poor hygienic conditions, and over-crowding that are also related to the cause.[16] Ali et al, from Agha Khan University reported two cases from Sindh, Pakistan. Both cases were from rural areas and belonged to poor economic status.[17]

In our study, nearly sixty percent of the patients had underlying diseases such as basal cell carcinoma and squamous cell carcinoma. Interestingly, all patients with basal cell carcinoma and Ophthalmomyiasis were of old age, suggesting a potential neglect of this age group and delayed presentation to tertiary care hospitals, which may have contributed to the development of this disease.[18] Additionally, Ophthalmomyiasis is known to be associated with immunocompromised status, further underscoring the importance of considering underlying health conditions in the context of this condition. In addition to this, almost 2/3rdof our series had some systemic disease, the more prevalent being diabetes mellitus.

In our study, approximately 66.6% of patients presented with orbital myiasis, while fewer patients had external Ophthalmomyiasis (33.3%), and no patients presented with internal Ophthalmomyiasis. This discrepancy can be elucidated by the fact that cases of external and internal myiasis may often be managed in other local healthcare setups, while cases of orbital myiasis, especially those complicated by underlying diseases, are more likely to be referred to tertiary care hospitals for specialized management and comprehensive treatment. Earlier one case report of external Ophthalmomyasis was published from Bahawalpur in a 2 years old child following head trauma.[19]

Ophthalmomyasis is a rare condition in both developing and developed countries due to more awareness but in Pakistan, we often come across such cases.[20] Early consultation, immediate diagnosis and prompt treatment can decrease the complications of this disease.

The study's strength lies in its emphasis on educating healthcare professionals, particularly medical practitioners working in peripheral areas, about the significance of considering Ophthalmomyiasis as a potential differential diagnosis when managing cases of conjunctivitis or keratitis. Moreover, the study's significance is underscored by its reporting of a high number of Ophthalmomyiasis cases presented to a tertiary care hospital, thereby shedding light on the primary associations and contributing to the broader understanding of this condition.

The limitation of this study is that, it is single center study with retrospective design and we have not studied the role of systemic ivermectin in such patients.

Future recommendations for further research could involve conducting a multi-centered study to gather more comprehensive data on Ophthalmomyiasis cases. Additionally, it would be beneficial to involve local entomologists in the diagnostic process to accurately determine the type of maggot involved. Furthermore, there is a need to investigate the potential role of systemic anti-parasitic drugs such as ivermectin or albendazole in the management of Ophthalmomyiasis, which could provide valuable insights into treatment strategies for this condition.

CONCLUSION

Health Education is the mainstay in prevention of Ophthalmomyasis. The incidence of myasis can be reduced by improving the hygienic conditions. People should be educated about wearing safety coverings on legs while working in fields. Most of the patients coming with Ophthalmomyasis were old age and had underlying disease. People should also be educated regarding provision of family support to the elderly people and prompt treatment of their underlying diseases. Eradication of maggot's eggs from the infected site is mandatory to prevent further remission of the disease. Due to under reporting of such cases, clinicians still have less knowledge about implications of Ophthalmomyasis.

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Ethical Approval: The study was approved by the Institutional review board/Ethical review board **(528/RC/KEMU)**.

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