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Original Research Article

Myiasis of the head-neck region: a grossly underreported entity in the practice of otorhinolaryngology

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ABSTRACT

Background: The term "myiasis" denotes a parasitic infestation of live human/vertebrate animal host by dipterous larvae of flies. In the head-neck region, the nasal cavity is most commonly involved. Risk factors include extremes of age, habit of sleeping outdoors in daytime and rural residence. The maggots have a tendency to burrow into host tissues with propensity to cause local/distant complications. There is paucity of clinical material on this subject suggesting that it is grossly under-reported. This study was performed to determine the patient profile, various sites of involvement, associated complications and response to treatment.
Methods: Detailed history was taken regarding relevant points followed by clinical examination in every case. Radiological investigation was advised whenever indicated. Daily removal of maggots was done endoscopically and patients were discharged only when they were maggot free on two consecutive days. All relevant information was noted in a standard case sheet.
Results: 20 patients were identified with female preponderance of 2.3:1. All patients hailed from lower socio-economic background and 85% had rural residence. Cases presented throughout the year with maximum incidence in summer. Most patients were in extremes of age. 80% had nasal cavity involvement followed by aural (15%) and tracheostomal involvement (5%). Complications were exclusively associated with nasal myiasis. Aural myiasis was seen exclusively in children.
Conclusions: Myiasis of the head-neck region appears to be an omnipresent health problem in the Indian subcontinent with propensity for complications if left untreated. It is a grossly under-reported condition with no standard treatment protocol.

Keywords: Dipterous larvae, Nasal myiasis, Atrophic rhinitis, Aural myasis, Maggots

INTRODUCTION

The term "myiasis" was first coined by Rev F.W. Hope when he reported about this condition in 1840.[1] It is derived from the Greek word "myia" meaning fly and denotes a parasitic infestation of live human or vertebrate animal host by dipterous larvae of flies which feed on host tissues or fluids.[2] It may affect any part of the body including the skin, eyes, nose, ear, anus, vagina and oral cavity.[3] In the discipline of otolaryngology, the earliest references in the modern medical literature have mostly mentioned about maggot infestation of the nose as it is probably the most commonly involved area of the head-neck region.[1] This condition was however known to mankind even in the medieval times and had originally been thought to be a form of divine punishment as noted in Hindu mythological works. It was thought to develop

as a result of the sins committed by a person or as a result of the wrath of saints.[4]

It primarily tends to affect people of lower socioeconomic status and patients are usually in the extremes of age and debilitated or mentally unstable and unable to take care of themselves. The condition is mostly seen in the Indian and African subcontinent where the tropical weather plays an important factor in its pathogenesis. The habit of sleeping outdoors during the day time seems to be a specific risk factor.[5] Other contributing factors include poor hygiene, bad housing conditions, overcrowding, vascular disease and diabetes.[6] The close proximity to domesticated animals is also thought to be an important risk factor.[7] Though it said to occur throughout the year, the cases tend to peak in the post-monsoon period between October and December.[1]

There is a lot of debate from an entomological point of view regarding the specific species of flies that causes myiasis but a couple of factors appear to play a role a common role in its pathogenesis.[4]

Firstly, the presence of fetid discharge from the nose or any other infected area in the body tends to attract the flies. Secondly, poor personal hygiene and habit of sleeping outdoors during the day time makes it easy for the flies to get access to the host to lay eggs.

Once oviposition takes place, the maggots will hatch and start feeding on the underlying tissues and also burrow through them resulting in local destruction of anatomical boundaries and a systemic inflammatory response.[4] This may lead to a number of local and distant complications. Associated bacterial infections further complicate the picture leading to untold suffering and life threatening complications in some instances. Nasal myiasis is particularly prone to various complications like destruction of the nasal septum, orbital involvement, destruction of the hard palate with oral cavity involvement and intracranial spread etc.[8]

Even though this condition is still very much prevalent in the Indian sub-continent, a thorough and extensive search of the databases reveal that it has only found occasional and sporadic mention in journals of our discipline and most of them have been restricted to case reports, review articles and retrospective studies. Thus some authors feel that this is a grossly underreported condition.[9] The present authors have encountered such cases at regular intervals, albeit in small numbers, from time to time. Hence we have undertaken a study of this condition with the following objectives in mind: to identify cases of myiasis of the head-neck region and gain an insight in to the patient profile, site and extent of involvement, to identify the underlying complications if any, to manage them as per current treatment protocols, to analyze the results and compare them with available literature.

METHODS

A prospective study was carried out in the department of Otolaryngology at our institute from April 2016 to Dec 2019 after obtaining due clearance from the Ethics Committee of our hospital. As cases with this condition do not present frequently, it was decided to perform a time bound study and cases were chosen by the method of convenience sampling (a type of non-probability sampling method). Due consent was taken from patients in every case.

After admission in the isolation ward, a detailed history was taken in all cases regarding the relevant points. A thorough clinical examination (including endoscopy) was performed and the findings were recorded in a standard case sheet prepared for this purpose. Routine investigations included a complete blood count and fasting and post prandial blood sugar estimation. CT scan of the nose and paranasal sinuses or the temporal bone region was advised wherever indicated to delineate the extent of destruction and local involvement. Medication included a first-line oral antibiotic to control the local infection and paracetamol to control local pain (wherever indicated). Topical nasal decongestants and cetrizine was also prescribed to those with nasal myiasis for symptomatic relief.

All cases of nasal myiasis were managed by removal of the maggots in multiple sittings using a nasal endoscope. Initially after applying a local anesthetic solution, turpentine oil was instilled into the nose and then the maggots were removed using nasal dressing forceps and suction apparatus.

Cases of aural myiasis were managed by examination under the microscope under light sedation as all the patients were below 10 years of age. The maggots were removed by aural dressing forceps after a saline wash.

The single patient with maggot infestation of the tracheostomy site was managed by regular local dressing and flexible endoscopic assessment of the airway.

The sole patient who presented with features of cavernous sinus thrombosis with nasal myiasis had to be admitted in the ICU and MRI scan of brain was advised. He was managed with higher antibiotics and parenteral heparin for control of the condition as per the advice of a neurologist.

All the maggots which were removed were killed by putting them in absolute alcohol and disposed off as per hospital guidelines. The patients were discharged only when no maggot was found on examination on two consecutive days.

All the data was entered in Excel and analysis of ratios and proportions was done. Further statistical correlation was not possible due to small sample size.

RESULTS

A total of 20 patients were identified with myiasis of the head and neck region during the period of study. Of them, 14 were females (70%) and 6 were male patients (30%) with a ratio of 2.3:1.

Table 1: Seasonal distribution of cases.

Season	Period	Number of patients
Summer	April – June	9 (45%)
Monsoon	July – September	5 (25%)
Autumn	October	0
Winter	November – January	5 (25%)
Spring	February – March	1 (5%)

Table 2: Complications associated with nasal myiasis.

Complication	Number of patients
Septal perforation	2
Periorbital edema	2
Palatal perforation	1
Oro-nasal fistula	1
Cavernous sinus thrombosis	1
Unilateral Glue Ear	1

Table 3: Area of involvement and presenting complaints (*Both patients with oral cavity involvement had co-existing nasal myiasis).

Site of involvement	Presenting complaints	Number of patients
Tracheostomy site	Bleeding from tracheostome and foul smell	1
Oral cavity	Pain and ulceration of the palate and/or gingiva	2
Ear	Blood stained aural discharge. Complain of maggots coming out of the ear	3
Nasal cavity	Blood stained nasal discharge with foul smell. Nasal stuffiness. Itching of nose and sneezing. Facial pain/ headache. Complain of maggots coming out of the nose	16

The age of presentation ranged widely from 2 years to 105 years (Figure 1). The maximum number of patients was encountered in the 61-70 year age group. No case was identified in the active age group of 11-30 years of age.

All patients were from lower socio-economic status and 17 were from the surrounding villages (85%) while 3 came from urban areas (15%).

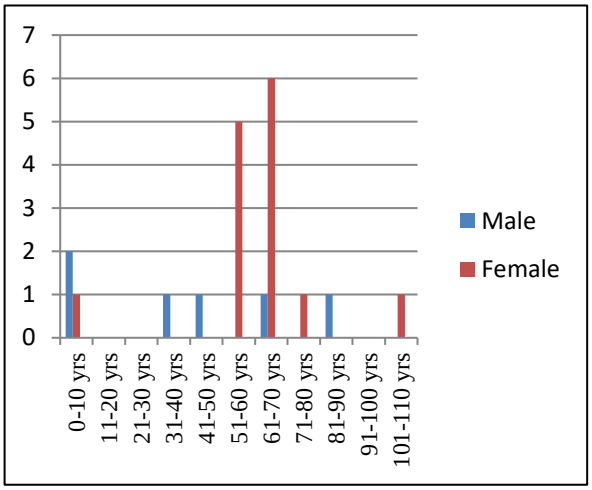

Figure 1: Age and sex distribution of patients.

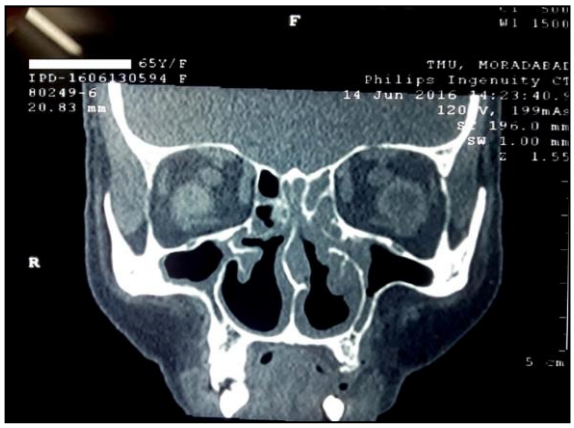

Figure 2: CT scan (coronal cut) showing roomy nasal cavities with destruction of turbinates.

Figure 3: Palatal fistula.

The seasonal distribution of cases revealed that most number of cases (9 cases – 45%) were seen in summer while 5 cases (25%) were seen in the monsoon period. 6 cases (30%) presented during the relatively cooler weather conditions between October to February (Table 1).

Figure 4: Fistulous communication between floor of nasal vestibule and vestibule of oral cavity.

16 out of the 20 patients (80%) presented with complaints related to the nasal cavity with 13 among them being females. 7 out of the 16 (i.e nearly half) had underlying features of atrophic rhinitis (Figure 2) and all but one were females. 2 of them had associated oral cavity involvement with one showing destruction of hard palate (Figure 3) and another showing a communication between the floor of the nasal vestibule and vestibule of oral cavity (Figure 4). Complications were exclusively seen in nasal myiasis and are summarized in Table 2.

All the 3 patients (15%) with aural myiasis had associated chronic otitis media with active ear discharge (of which 2 had unilateral disease and 1 had bilateral disease). Incidentally, all were below the age of 10 years and all of them presented in the monsoon season.

1 patient (elderly male) had maggot infestation of the permanent tracheostomy site (5%) in an inoperable case of carcinoma larynx.

The areas of involvement and presenting complaints of the patients are summarized in Table 3.

Response to treatment showed that aural myiasis responded quickly and all patients were maggot free after 2 sittings of treatment. Conversely, patients with nasal myiasis required an average of 4 sittings to be free from maggots. Average duration of hospital stay of the patients was 4 days for aural myiasis and 6 days for nasal myiasis.

DISCUSSION

As already mentioned, an extensive search of the available literature shows that myiasis of the head-neck region only finds sporadic mention in the form of isolated case reports and very few studies including analysis of retrospective data. But our study findings confirm that it is still an omnipresent health problem in the tropics with a sizeable number of cases in the rural community. In fact, other authors have also concluded that it is endemic in some parts of the world due to warm and humid conditions and is thus grossly under reported.[10]

Our study found a strong female preponderance of cases (2.3:1). Most studies also suggest female preponderance although the gap may be narrowing in recent times.[1,9]

While traditionally it has been said that most cases are encountered in the post-monsoon period, we encountered cases throughout the year with most patients clustered in the summer months. Arora and colleagues in a retrospective study involving 80 patients also concluded that it is now a perennial problem.[1]

We found that the most common site of involvement of the head-neck region was the nasal cavity (80%) which is in complete concordance with most of the available literature. Only White and co-authors have found that eye involvement was most common followed by the nose and other sites.[11]

The possible reasons for the nose being affected more commonly than the other sites are the following: easy accessibility for the flies, wide mucosa lined space with a moist environment that is easily prone to infections leading to fetid discharge and coexisting conditions like atrophic rhinitis which often coexist with this condition.[1,9] In the latter, the nerve endings are destroyed and the nasal mucosa is relatively less sensitive. Also the nasal cavity becomes roomy and shows crusting due to secondary infections. All these factors combine to make it an ideal location for the maggots to burrow in.

In our study 7 out of the 16 patients with nasal myiasis (43.75%) had features of atrophic rhinitis compared to 30% cases in another study.[1]

Complications are often associated with nasal myiasis and we encountered quite a few of them in our study. Apart from the relatively benign local complications like septal and palatal perforation which find mention in the literature, we encountered a case of cavernous sinus thrombosis and another case with a fistula between the floor of nasal vestibule and oral vestibule. An exhaustive search of the available literature shows that no such complication has ever been reported in the past in relation to nasal myiasis. The possibility of intra-cranial complication deserves a special mention as they may pose a direct threat to life. It has been estimated that the chance of fatality may be as high as 8% in this situation.[8]

Ear involvement was seen exclusively in children below age of 10 years with coexisting Chronic Otitis Media. Interestingly, all three cases presented in the monsoon months. Review of the literature also corroborates the fact that aural myiasis mostly tends to affect children and mentally retarded subjects.[12,13] An article on aural myiasis that reviewed data over a 20 year period has concluded that out of 45 cases documented in 34 manuscripts, there were no complications like intra-cranial spread and/or deaths and all cases were managed by simple aural toileting.[14] Therefore, it seems to follow a relatively benign course compared to nasal myiasis where complications are the rule.

Involvement of tracheostomy wound by maggots has occasionally been reported in the literature. One such case report was published by Franza in 2006.[2] Shakeel and colleagues have also reported a case of accidental tracheostomy wound infestation by maggots of the common housefly (Musca domestica) and they have concluded that only 3 such cases have been reported world-wide in English language literature till 2013.[15]

Search of the available literature have sporadic mention of other sites of the head-neck region that may also be involved by this condition. They include the oral cavity, eyes, orbit and malignant wounds of the head-neck region.[6,16,17,18]

Currently there is no consensus regarding a standard treatment protocol for nasal myiasis as only a few cases have been reported across the world till date.[11] Ideally, primary prevention by improvement of living conditions would be the best approach as the disease primarily affects the lower socio-economic strata of society. Better housing conditions, avoidance of sleeping outdoors and care of the elderly would go a long way in reducing the incidence of this condition. Those who present with myiasis of the nose and ear can be managed most efficiently by endoscopic/microscopic removal of the maggots in multiple sittings along with management of the associated complications. Long term management of underlying conditions like atrophic rhinitis will also reduce the risk of developing nasal myiasis by improving nasal hygiene.

Very recently in 2018, a paper has been published where the role of oral ivermectin has been studied in the management of 80 patients with nasal and nasopharyngeal myiasis. The authors concluded that there was a quicker response in achieving clearance of maggots and reduced duration of stay in the hospital compared to the traditional treatment described above.[19] A case report also published in 2018 claims similar result with quick clearance of maggots from the nose after nasal irrigation with ivermectin solution.[20]

The main limitation of this study is the relatively small sample size of 20 patients as this condition is not seen very regularly in the clinics. Moreover, the method of recruiting patients by convenience sampling technique (which is usually adopted for conditions that are not encountered very frequently) has a disadvantage that it cannot be representative of the population at large. The main purpose of the present authors has been firstly, to establish that this condition is definitely a persistent health problem in the community and secondly, to gain a deeper insight in to the understanding of this condition due to the paucity of available medical literature.

CONCLUSION

Myiasis of the head-neck region appears to be a grossly under reported condition and is still very much endemic in certain parts of the world with cases encountered all through the year. It is a totally preventable scourge of the tropics. Simple measures like improved housing, avoidance of sleeping outdoors and care for the elderly can eliminate this problem. Patient profile seems to suggest that most cases occur in extremes of age with female preponderance. Most patients seem to come from rural areas and nasal involvement is by far the most common. There is potential for development of severe complications if left untreated including threat to life from intra-cranial involvement in nasal myiasis. Morbidity due to suffering and health care related costs are also substantial in a developing country like India.

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