A STUDY OF KERATOMYCOSIS: OUR EXPERIENCE

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ABSTRACT

The aim of the present study was to determine the etiological agents, predisposing factors and important diagnostic tests in keratomycosis in Patna.

During period of 2 years, 204 clinically suspected cases of keratomycosis were studied by microscopy (10% KOH smear preparation and Gram's staining) and culture (for bacteria as well as fungus).

Out of 204 clinically suspected cases, 76 cases (37.23%) were reported positive for fungus by microscopy and culture. 77% cases were between the age group of 21 to 50 years. Males were more than double the number of females affected. 82% patients were farmers by occupation. 81.58% cases gave a definite history of antecedent corneal trauma. 6.58% cases were known diabetics. Peak incidence was recorded in the months of September-October of the years. Single fungal isolates were present in 63 cases (31%) and multiple were there in 3 cases (1.47%). Mixed isolates of bacteria and fungi were there in 4.90% cases.

The predominant isolate was Aspergillus species - 42 cases (52.26%) followed by Candida - 7 cases (9.21%), Penicillium - 6 cases (7.89%) and Fusarium - 6 cases (7.89%). Ten (13.15%) of fungal isolates remained unidentified.

Therefore mycotic keratitis should be suspected in every patient with a corneal lesion and should be ruled out promptly to save sight and before commencing steroids and antibiotics.

Key Words: Keratomycosis, Keratitis, Fungal infection.

INTRODUCTION

Keratomycosis is a common and important cause of corneal morbidity in tropics. Most prevalent in agriculture area, it is typically preceded by ocular trauma by some organic matter such as wood and hay particles. The acuteness of the problem in India specially our area is due to a relatively humid environment, poverty, illiteracy and ignorance, mycotic infections of the eye have assumed increasing importance in ophthalmology in recent years.3,4 As there is no definite pathognomonic clinical feature, Keratomycosis can easily be confused with other forms of microbial Keratitis. The differences in the causative organism should be recognised, since they ultimately influence the stains and media used for the isolation as well as the initial and more definitive therapy.

The disease has been known since 1879, when leber first reported a hypopyon ulcer caused by Aspergillus species.6

Fungi that infect the cornea are broadly classified as Yeasts and Molds or Filamentous fungi. Fungal keratitis caused by yeast frequently affect the immunocompromised or debilitated host or patient with preexisting chronic corneal disease.5

The symptoms of fungal keratitis may not present as acutely as with other forms of microbial keratitis. The most frequently encountered signs of fungal keratitis are commonly seen in other forms of microbial keratitis and include suppuration conjunctival injection, epithelial defect, stromal infiltration and anterior chamber reaction or hypopyon. Some findings like elevated areas, branching ulcers, irregular feathery margins, a dry texture and satellite lesions can be helpful in suggesting the diagnosis.4

The important point is that the disease should be suspected in bacterial corneal ulcers indolent and refractory to antibiotic therapy and with a history of ocular trauma and to save sight, keratomycosis should be promptly recognised by clinical features and some laboratory examinations because it is more likely to produce perforation in comparison to bacterial keratitis.2,3,4,5

The present paper presents the results of a study of 2 years to determine the aetiological agents, predisposing factors and important diagnosis tests of keratomycosis in Patna.

MATERIAL AND METHODS

This study was done in both out patients and in patients of department of Ophthalmology, IGIMS, Patna in a period of 2 years. The cases were selected on strong suspicion clinically and in patients not responding to treatment of bacterial keratitis. Data regarding the age, sex, occupational history of injury, nature of lesion and associated metabolic disorders were taken. Deep corneal scrapings were collected from margin of the ulcer after proper
Table-1: Microscopic and Culture Findings (n=204)

<table>
<thead>
<tr>
<th></th>
<th>KOH+Ve</th>
<th>Direct Microscopy</th>
<th>KOH+VE</th>
<th>KOH+VE</th>
<th>KOH+VE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gram+ve</td>
<td>Gram-ve</td>
<td>Gram+ve</td>
<td>Gram-ve</td>
<td>Gram-ve</td>
<td></td>
</tr>
<tr>
<td>Positive fungal Culture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Single</td>
<td>61</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>b) Multiple</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Positive Bact. Culture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Pure bacteria</td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>b) Bacteria mixed with fungus</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td></td>
<td>118</td>
<td></td>
<td></td>
<td>118</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>3</td>
<td>10</td>
<td>118</td>
<td>204</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(35.76%)</td>
<td>(1.47%)</td>
<td>(4.90%)</td>
<td>(57.75%)</td>
<td>(100%)</td>
<td></td>
</tr>
</tbody>
</table>

Table-2: Age and sex incidence of Mycotic Keratitis - (n=76)

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 20</td>
<td>05</td>
<td>03</td>
<td>08</td>
</tr>
<tr>
<td>21-30</td>
<td>17</td>
<td>02</td>
<td>19</td>
</tr>
<tr>
<td>31-40</td>
<td>14</td>
<td>08</td>
<td>22</td>
</tr>
<tr>
<td>41-50</td>
<td>12</td>
<td>06</td>
<td>18</td>
</tr>
<tr>
<td>51-60</td>
<td>04</td>
<td>02</td>
<td>06</td>
</tr>
<tr>
<td>Above 60</td>
<td>02</td>
<td>01</td>
<td>03</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>22</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>(71%)</td>
<td>(29%)</td>
<td></td>
</tr>
</tbody>
</table>

Tablen III: Predisposing Factors in Positive Cases (ie. microscopic & culture) (n=70)

<table>
<thead>
<tr>
<th>Truma</th>
<th>Foreign body</th>
<th>Cataract surgery</th>
<th>Diabetes factors</th>
<th>No +ve</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>42</td>
<td>14</td>
<td>06</td>
<td>05</td>
</tr>
<tr>
<td>%</td>
<td>55.26</td>
<td>18.42</td>
<td>7.90</td>
<td>6.58</td>
</tr>
</tbody>
</table>

Cleaning of eye with saline and instilling 2-3 drops of sterile local anaesthetic solution (lignocaine). Swabs from the surface of the ulcers were also taken.

The scrapings were examined first in a drop of 10% KOH. Gram's staining was done from the swab samples for the presence of bacteria, yeasts and other fungi. The samples were inoculated in blood agar and Mac Conkey's agar and incubated at 37°C for bacterial isolates.

Samples were also inoculated on four Sabouraud's dextrose agar slants with or without chloramphenicol and incubated at room temperature and at 37°C respectively, the slants were observed daily for period of three weeks for fungal growth and identification were done by culture characteristics of colonies and microscopic morphology. Candida species were identified in addition by standard tests like germ tube test and sugar fermentation tests. In mixed growths,
Table IV shows various types of fungal isolates obtained in the study. Predominant isolate was Aspergillus species in 42 cases followed by candida. In 7 cases, penicillium and Fusarium in 6 cases each. 10 cases remained unidentified. Multiple fungal isolates were in 3 (1.47%) cases, which were in combination of Penicillium and Fusarium species mainly. Aspergillus with Candida combination was also observed. In mixed infections, staphylococcus aureus and Pseudomonas aeruginosa were observed with Aspergillus species. 71.42% Candida species were isolated from diabetic patients.

DISCUSSION

Blood agar and Macconkey’s agar were used to slants helped us to confirm fungal etiology for mycotic keratitis.

In our findings. 37.23% cases were positive for fungi, which is comparable to the reports from Chandigarh, Amritsar, Gawahati, Tamilnadu, Darjeeling and Mumbai in different years. The study shows the preponderance of the disease in 21-50 years age group i.e. in physically active adults. More in males again most probably due to their outdoor occupational activities, so more exposed to trauma. Similar observations were reported by Pankaja-Laxmi from Chennai, Dasgupta from Pondicherry, Reddy from Hyderabad, Puttanna from Bangalore and Despande from Mumbai.

As all the fungi isolated from corneal ulcers are prevalent as saprophytes in the atmosphere, even a slight abrasion can initiate the ulcer. The history of trauma was there in 55.26% cases, which is comparable to the results of Dasgupta et al, Reddy et al and Despande et al. Pankaja Laxmi and Kalavathy al found the incidence a bit more i.e. 66.80% whereas Talwar and Sehgal in only 30% of their cases.

KOH preparation is easy, quick and reliable method and has been supported by many research workers.

Incidence of Aspergillus sp. was the greatest i.e. 55.26%, which corroborates with the findings of various workers. Candida species was at
2nd number followed by the other fungi enumerated earlier1,2,10,15,18.

In our study bacterial isolates were observed in 9.80% of the total cases studied. Bacterial isolates in mycotic keratitis has been reported by only few workers4,5,12. Pseudomonas species was most predominant which corroborates with the findings of Thomas from Florida4, Upadhyay from Nepal11 and Despande from Mumbai5.

CONCLUSION

The study brings out the following conclusions -

- As mycotic keratitis can easily be confused with other forms of microbial keratitis, on suspicion it should be ruled out promptly and properly before commencing steroids and antibiotics, in order to save the sight.

- To be prompt in diagnosis, KOH smear preparation is a reliable method.

- Along with clinical features, history of trauma is an important predisposing factor.

- Aspergillus sp is one of the predominant organism in air and hence can easily infect injured cornea.

References


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