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Assessment of cases of Pythium insidiosum keratitis- A clinical study

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Abstract
Background: The present study was conducted to assess the cases of Pythium insidiosum keratitis.
Materials & Methods: 84 cases of Pythium keratitis of both genders were included. In all patients, clinical course and visual outcome were analyzed
Results: Out of 84 patients, males were 52 and females were 32. The common risk factors were dust in 50, dirty water in 12, insect injury in 14 and unknown in 10 cases. Clinical appearance was tentacle like infiltrate in 36, dot like infiltrate in 20, peripheral furrowing in 15 and total corneal ulcer in 13 cases. Medical therapy was Natamycin + voricanazole in 40, natamycin in 22, Itraconazole nin 18 and itraconazole + azthromycin in 4 cases. The difference was significant (P<0.05).
Conclusion: Authors found that maximum cases were seen in males and common clinical finding was tentacle like infiltrate.

Keywords: Eyes, Pythium keratitis, tentacle like infiltrate

Introduction
Increasing reports of Pythium keratitis in recent years has garnered much attention, with reports emerging from the Asia Pacific region. Pythium is an oomycete that causes a devastating infection of the cornea and has been reported to have a poor outcome [1]. It is a very difficult disease to treat with patients responding poorly to the conventional antifungal medication or to surgical procedures such as penetrating keratoplasty. Major reports of both systemic and ocular infections being caused by Pythium insidiosum are found to be endemic there because of their climatic conditions [2].

Pythium insidiosum keratitis is an uncommon but sight-threatening disease with high morbidity. It occurs when the cornea is infected by Pythium insidiosum (P. insidiosum). P. insidiosum, belonging to the kingdom Stramenopila, is a fungus-like, aquatic oomycete found in tropical, subtropical, and temperate climates [3]. It was long misrecognized as a fungus due to its fungus-like morphologic characteristics. The organism usually presents in 2 forms: one is the hyphae characterized by right-angle branching or broad filaments, and the other is the aquatic motile biflagellate zoospore, which is the infective propagule and only presents in aquatic environments [4]. Clinical presentation of human pythiosis can be classified into 4 types: subcutaneous, vascular, ocular, and systemic. Consistent with other forms, ocular pythiosis has been proved to have extremely poor prognosis [5]. In retrospect, there are 3 papers that described the rates of patient undergoing enucleation/evisceration. The investigations in 2003 and 2006 revealed the rate to be 87.5% and 79%, respectively [6]. The present study was conducted to assess the cases of Pythium insidiosum keratitis.

Materials & Methods
The present study was conducted among 84 cases of Pythium keratitis of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Corneal scrapings were collected under topical anesthesia using 0.5% proparacaine. Scrapings were assessed for smear examination. The characterized colony morphology of the Pythium species on the blood agar prompted us to the possibility of Pythium. The eyes with positive fungal smears were treated with 5% natamycin suspension. In all patients, clinical course and visual outcome were analyzed. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1 shows that out of 84 patients, males were 52 and females were 32.

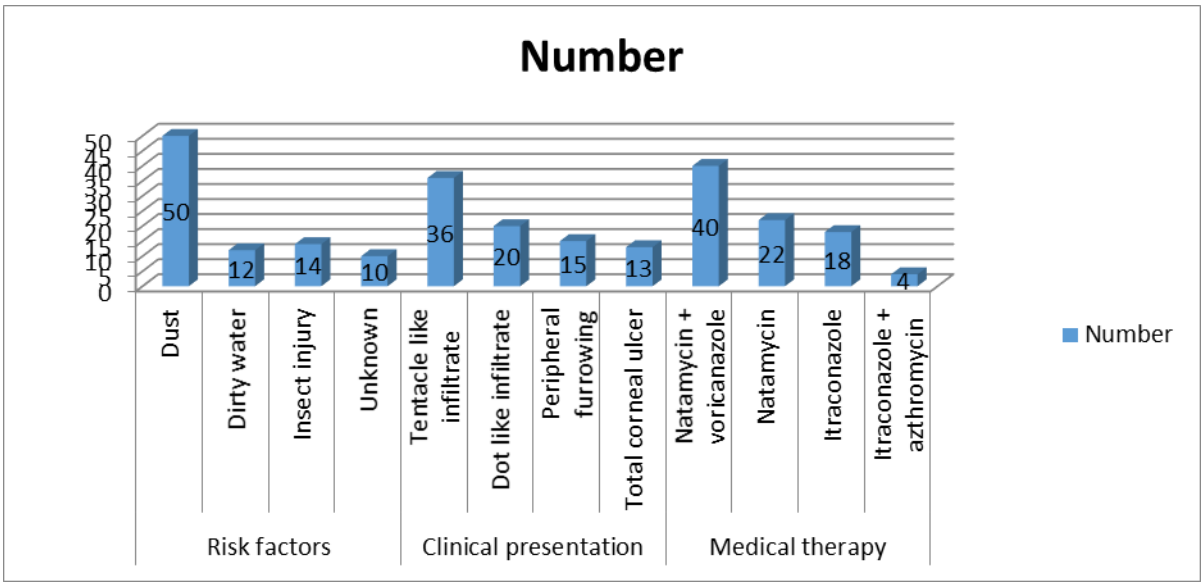
Table 1: Distribution of patients

Total- 84		
Gender	**Males**	**Females**
Number	52	32

Table 2: Assessment of parameters

Parameters	Parameters	Number	P value
Risk factors	Dust	50	0.01
	Dirty water	12	
	Insect injury	14	
	Unknown	10	
Clinical presentation	Tentacle like infiltrate	36	0.02
	Dot like infiltrate	20	
	Peripheral furrowing	15	
	Total corneal ulcer	13	
Medical therapy	Natamycin + voricanazole	40	0.05
	Natamycin	22	
	Itraconazole	18	
	Itraconazole + azthromycin	4	

Table II, graph I shows that common risk factors were dust in 50, dirty water in 12, insect injury in 14 and unknown in 10 cases. Clinical appearance was tentacle like infiltrate in 36, dot like infiltrate in 20, peripheral furrowing in 15 and total corneal ulcer in 13 cases. Medical therapy was Natamycin + voricanazole in 40, natamycin in 22, itraconazole in 18 and itraconazole + azthromycin in 4 cases. The difference was significant (P<0.05).



Graph I: Assessment of parameters

Discussion

The visual morbidity that often results from Pythium keratitis underscores the importance of studying its epidemiology [7]. Reports have described the different modalities for recognizing this organism from the growth on culture media [8]. Another area of concern is the lack of standardized treatment protocol for these devastating organisms, and various treatment options have been recommended [9]. Nitingpong *et al*. [10] indicated that the rate can reduced to 55% by combination therapy including surgery, antifungal agents, and *P. insidiosum* antigen (PIA). *P. insidiosum* keratitis in younger patients seems to have a better prognosis than in older ones. Aside from enucleation/evisceration, penetrating keratoplasty (PK) is the most effective means for removing infected tissue while protecting the globe and vision. The present study was conducted to assess the cases of Pythium insidiosum keratitis.

In present study, out of 84 patients, males were 52 and females were 32. Agarwal *et al*. [11] in their study assessed clinical profile and role of perioperative adjunctive measures to reduce the risk of recurrence in Pythium insidiosum keratitis. Retrospective analysis of 10 eyes of 10 patients with *P. insidiosum* keratitis. Diagnosis was confirmed by PCR DNA sequencing. 7 out of 10 patients were from urban locales, and none had any obvious history of injury with vegetative matter and were being treated for fungal keratitis. 6 eyes presented with central full thickness infiltrates with subepithelial and superficial stromal infiltrates radiating in a reticular pattern. Corneal scraping in

all eyes revealed sparsely septate fungal-like filaments on potassium hydroxide/Calcofluor. All eyes underwent the first therapeutic penetrating keratoplasty (TPK) based on worsening or non-responsiveness of clinical features to the antifungal regimen. Recurrence was noted in 7 out of 10 eyes of which 2 eyes underwent evisceration. Of the six eyes that underwent cryotherapy following confirmation of microbiological diagnosis of Pythium (along with primary TPK-1, with re-TPK-5), only one eye had a recurrence and had to be eviscerated. Of the two eyes that did not undergo cryotherapy during re-TPK, following microbiological diagnosis, one eye had a recurrence and had to be eviscerated. In two eyes with adjoining scleritis, the host bed was swabbed using absolute alcohol of which one eye was salvaged.

We found that common risk factors were dust in 50, dirty water in 12, insect injury in 14 and unknown in 10 cases. Clinical appearance was tentacle like infiltrate in 36, dot like infiltrate in 20, peripheral furrowing in 15 and total corneal ulcer in 13 cases. Medical therapy was Natamycin + voricanazole in 40, natamycin in 22, Itraconazole in 18 and itraconazole + azthromycin in 4 cases. Hasika *et al.* [12] in their study seventy-one patients with microbiologically proven Pythium keratitis were identified. The mean age was 44(±18.2) years with an increase in male preponderance and 50% were farmers. Duration of delay at time of presentation to the hospital was a mean of 14(±7.2) days. The visual acuity at baseline ranged from 6/6 to no light perception (median 2.1 logMAR). A combination of 5% natamycin and 1% voriconazole was given to 42% patients, and natamycin alone was given to 39.4% patients. 1% itraconazole eye drops alone was initiated in 7 (10%) patients and 3 among this group responded. Therapeutic keratoplasty (TPK) was performed in 48 (67.6%) patients. None of the primary grafts remained clear after a period of 1 month. Twenty-six eyes (54.2%) had graft reinfection and all these eyes either developed anterior staphyloma (4) or were eviscerated (3) and 13 eyes became phthisical. The remaining 22 patients who had TPK resulted in failed graft. Among these, re-grafts were performed in 6 patients, of which 5 were doing well at the last follow-up.

Conclusion

Authors found that maximum cases were seen in males and common clinical finding was tentacle like infiltrate.

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