

MUCORALES INFECTION AS A COMPLICATION OF DIABETES MELLITUS – A SUMMARY OF THAI CASES

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SUMMARY

Mucorales infection brings health problems in tropical countries, especially in South Africa. In Thailand, there are sporadic cases of these infections. Of several underlying causes, diabetes mellitus is the most common etiology. This retrospective study was performed to analyze the information on Mucorales infection among diabetes mellitus patients in Thailand. The study included data on 11 Thai diabetic patients with Mucorales infection from four reports. There were seven female and four male patients, mean age 47.6 ± 15.2 years. The mean duration of the disease before presentation of patients with Mucorales to physician was 12.2 days. The outcome is known for only two of 11 patients, and these two patients died. In conclusion, the manifestation of zygomycosis in Thai patients is similar to prior reports, however, showing a predominance of adult female patients.

INTRODUCTION

Zygomycosis, an uncommon but frequently fatal mycosis caused by fungi of the class Zygomycetes, develops most commonly as an opportunistic disease. Successful therapy includes a combined approach

based on early diagnosis, prompt institution of medical therapy, and extensive surgical debridement of all devitalized tissue (1). Medically, the disease is caused by infection with fungi of two orders, Mucorales and Entomophthorales. The first group includes the genera *Rhizopus*, *Mucor* and *Absidia* (2). Concerning Mucorales infection, the clinical patterns of the disease produced by different genera or species of Mucorales are virtually identical. Clinical manifestations of invasive Mucorales infection are tissue necrosis and subsequent thrombosis. Most of the infections presented as pulmonary manifestation. The common features of pulmonary disease include fever, dyspnea, hemoptysis, and cavitation on radiologic examination (3).

Immunocompromising states such as hematologic malignancy, bone marrow or peripheral blood stem cell transplantation, neutropenia, solid organ transplantation, diabetes mellitus (DM) with or without ketoacidosis, corticosteroids, and deferoxamine therapy for iron overload predispose patients to infection. Of several underlying causes, DM is the most common etiology (4). Concerning other underlying causes of infection, renal failure is a common cause. Indeed, DM and uremia bring many ketones or glucose into the blood circulation, where they provide a favorable environment for the fungi to grow and replicate. The other underlying causes of Mucorales infection are immunosuppressive and steroid drugs (3).

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Table 1. Characteristics of reported patients

Authors	Sex (M/F)	Age (yrs)	PTA	Type	Other underlying causes	Outcome
Wiriyasatiankun and Komolsuradej, 1992 (5)	F	29	3 days	Rhinocerebral	No	No data Died
Wiriyasatiankun and Komolsuradej, 1992 (5)	F	32	2 days	Rhinocerebral	Renal tubular acidosis	Died
Aikvanich and Niampradit, 1990 (6)	M	59	3 wks	Rhinocerebral	Steroid drug	Died
Ponglertnapagorn et al., 1994 (2)	M	45	3 days	Pulmonary	No	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	F	48	34 days	Rhinocerebral	Chronic renal failure	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	F	39	7 days	Rhinocerebral	No	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	F	53	7 days	Rhinocerebral	Chronic renal failure, hypertension	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	F	63	30 days	Rhinocerebral	Hypertension	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	F	56	14 days	Rhinocerebral	No	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	M	74	3 days	Rhinocerebral	Stroke, ketoacidosis	No data
Krekhanjanarong and Supiyaphun, 1997 (7)	M	26	10 days	Rhinocerebral	Lung tuberculosis	No data

Mucorales infection brings health problems in tropical countries, especially in South Africa. In Thailand, there are sporadic cases of these infections. This retrospective study was conducted to analyze data on Mucorales infection among DM patients in Thailand. According to study results, it can be said that zygomycosis is a severe disease, if not diagnosed early and treated promptly.

METHODS

This study was designed as a retrospective case summary to compile previous literature reports on Thai DM patients with Mucorales infection. Data were collected by literature search using Pubmed and Thai Index Medicus. The reports lacking clear definitive diagnosis of Mucorales infection were excluded. Data on patient age, sex, address, clinical manifestation, duration of infection before admission, complication, underlying cause, laboratory investigations and

treatment outcome were noted. Then, all data were analyzed using descriptive statistics. The Excel for Windows software was used on statistical analysis.

RESULTS

The search of literature revealed 11 Thai DM patients with Mucorales infection in 4 reports (2,5-7). There were seven female and four male patients, mean age 47.6 ± 15.2 years. Patient characteristics are summarized in Table 1. The mean duration of the disease before presentation of patients with Mucorales to physician was 12.2 days. The outcome is known for only two of 11 patients, and these two patients died.

DISCUSSION

Patients at highest risk of infection caused by Mucorales fungi include those with profound immunosuppression or DM. As DM patients have an impaired immune status, they require special attention on considering infectious diseases, especially fungal

infection (8). The Mucorales infection is a tropical disease. Tissue invasion due to this fungal infection can cause many severe manifestations.

There are continuously sporadic case reports of Mucorales infection in DM patients in Thailand. However, there is no complete case summarization on Mucorales infection among DM patients in Thailand, therefore we embarked upon this study to make an overview of the topic. According to our study, 11 cases have been reported in the literature, with a female predominance. This female sex predominance is discordant with previous reports indicating a male predominance. Most study patients were adults, age range between 20 and 60 years (nine of eleven

patients). This finding is also inconsistent with previous reports showing a predominance of infection in childhood (9-11).

Concerning the forms of clinical manifestations of Mucorales infection, we found the rhinocerebral form to be most common. In the total of eleven cases, there were as many as ten patients with rhinocerebral mucormycosis, this high proportion being consistent with previous reports (9-11). Concerning pulmonary mucormycosis, there was only one case of this form of the infection in our series.

In conclusion, the rate of Mucorales infection in Thai patients was found to be similar to previous reports. However, the female predominance of the infection recorded in this study should be noted.

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