Malignant otitis externa. Our experience

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Received December 17, 2009; accepted February 17, 2010

Abstract

Malignant otitis externa is a devastating disease that poses a diagnostic and therapeutic challenge. The objective of our study was to demonstrate the importance of detailed clinical analysis and to provide an update on the current diagnostic and therapeutic tools available.

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KEYWORDS

Malignant otitis externa; Necrotizing otitis externa

PALABRAS CLAVE

Otitis externa maligna; Otitis externa necrotizante

Introduction

Malignant external otitis (MEO) is a severe disease whose diagnosis and treatment is a challenge for any specialist. The first description was carried out in 1959 by Meltzer and Kelemen,1 but it was in 1963 and 1968 with the work of Chandler2 that it was defined with the term MEO.

MEO occurs in patients with decreased immune systems mostly elderly diabetics (90%), generally insulin-dependant and poorly controlled. There are also forms of MEO in youths and children. The main differential diagnosis is with malignant tumours of the external ear canal (EAC).3

Although mortality was high for the past few years, at present the prognosis has improved due to good response to prolonged treatment with fluoroquinolones. The purpose of this study is to demonstrate the importance of detailed clinical analysis and to provide an update on currently available diagnostic and therapeutic tools.

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Material and method

We conducted a prospective study of 8 patients treated at our hospital with a diagnosis of MEO between the years 2005-2009 (Table). As for the diagnostic protocol, we performed a CT scan and a combination of Tc-99m and Ga-67, the latter essential for monitoring. In cases of neurological complications, MRI was requested. An EAC biopsy and bacterial culture were carried out in all cases.

All patients were admitted for treatment. This consisted primarily in local cure and topical administration of ciprofloxacin 2 times a day, as well as intravenous antibiotics. We proceeded to control glycaemia and began treatment with oral antidiabetic agents or insulin.

Our discharge criteria were: normal otoscopy, C-reactive protein values and erythrocyte sedimentation rate within normal limits and negative Ga-67 scintigraphy. After discharge, all patients continued treatment with oral ciprofloxacin for 6 weeks, at a dose of 500 mg/12 h.

Results

The bacteriological study isolated *Pseudomonas aeruginosa* in 3 cases, *Aspergillus flavus* in 1 case, *Candida albicans* in 2 cases and the cultures were negative in 2 patients.

Bone erosion and occupation of the external ear canal and middle ear were observed on the CT scan (Figure 1). The Ga-67 scintigraphy showed an increase of osteogenic response in the petrosal (Figure 2).

Laboratory tests showed elevated C reactive protein and erythrocyte sedimentation rates in all cases.

The average duration of intravenous therapy was 6 weeks (range 3-12). Patients were treated with 3rd generation cephalosporin and a fluoroquinolone or a broad-spectrum antibiotic from *Pseudomonas* (piperacillin-tazobactam, imipenem). Amphotericin B was also administered in cases where *Aspergillus flavus* or *Candida albicans* were detected as pathogens, except in one case with liver cirrhosis where imidazole was administered and another case in which no germ was isolated that responded satisfactorily.

A total of 4 patients suffered facial paralysis, one of them from the time of diagnosis. Of these 4 patients, 1 also presented involvement of other cranial nerves. Two patients recovered facial function during treatment.

One patient suffered a cerebrovascular pontine stroke during treatment.

We performed a mastoidectomy on 1 patient, due to the absence of improvement with medical treatment and to the persistence of granulation tissue and facial involvement.

The control of otalgia was very difficult in 3 patients despite treatment with morphine. They received hyperbaric oxygen therapy after discharge with satisfactory results.

Two patients suffered relapses at 3 and 12 weeks, respectively. One of them evolved favourably after treatment and the other, in whom a number of factors coincided (age, poorly controlled diabetes, involvement of cranial nerves and cerebrovascular pontine stroke), died. The rest are currently free of disease.

| Table |
|---|---|---|---|---|---|---|---|---|
| Patient | Age | Gender | ID | Affected cranial nerves | Affected ear | Polyps and granulation | Elevated ESR and CRP | Treatment evolved |
| 1 | 83 | M | DM | LE | VII, IX | No | Yes | Amphotericin B-piperacillin+fluoroquinolone and death |
| 2 | 77 | M | DM | LE | VII | Yes | Yes | Amphotericin B+3rd-generation cephalosporin+fluoroquinolone |
| 3 | 73 | M | DM | Bilateral | VII | Yes | Yes | No germ isolated+Amphotericin B+tazobactam+fluoroquinolone |
| 4 | 70 | F | DM | RE | No | Yes | Yes | Pseudomonas+Imipenem+fluoroquinolone |
| 5 | 76 | M | DM | RE | No | Yes | Yes | Pseudomonas+Imipenem+imidazole+fluoroquinolone |
| 6 | 80 | M | DM | RE | No | Yes | Yes | Pseudomonas+Imipenem+fluoroquinolone |
| 7 | 70 | M | DM | LE | Yes | No | Yes | Pseudomonas+Imipenem+fluoroquinolone |
| 8 | 57 | M | DM | LE | Yes | No | Yes | Pseudomonas+Imipenem+fluoroquinolone |

CRP indicates C reactive protein; F, female; ID, immunosuppression; M, male.
worse prognosis,6 but recent studies found no differences cranial nerves has been considered as an indicator of a nerve was also affected. Traditionally, the involvement of from the time of diagnosis. In 1 patient, the hypoglossal base. Of our patients, 4 presented facial palsy, 1 of them of cases,2 indicating the spread of infection to the skull infection, such as by Aspergillus and Candida) is more severe and mortality is higher (42%).10 In our series, the patient with the worse outcome was the one in whom Aspergillus was isolated.

The analytical tests often show elevated inflammatory and infectious markers, which represent an interesting evolutionary parameter despite a lack of specificity.

The diagnosis and monitoring of MEO has improved considerably with the development of modern imaging techniques.10 CT is useful in confirming the diagnosis.11 In evolved forms, it makes it possible to assess the extent of the disease to the petrosal mass, subtemporal peritubal and parapharyngeal spaces and temporomandibular joints. However, it is not a specific test and is of little interest in monitoring. An MRI is useful in defining the involvement of soft tissues, especially the infratemporal, but is also of little value in monitoring.11

Scintigraphy plays an important role in diagnosis and monitoring. Bone scintigraphy with Tc-99m is regarded as the key test for an early diagnosis.12,13 Technetium fixation is correlated with osteolytic activity, which explains its high sensitivity (100%), but its specificity is low.14 It remains positive long after recovery and is therefore not applicable in monitoring.

Ga-67 scintigraphy is considered essential in evolution control and monitoring due to its high specificity. The standardisation of the test confirms the healing of the disease.15,3

Currently, the basis of treatment is antibiotic therapy, leaving surgical debridement and additional treatments such as hyperbaric oxygen therapy, for those cases with poor response and torpid evolution.10

In general, hospitalisation is recommended to perform a complete study and establish early treatment. Several guidelines have been proposed; most authors combine a 3rd-generation cephalosporin with a fluoroquinolone to avoid resistences.13,16,17 Others use the association of semi-synthetic penicillin with an aminoglycoside, but its potential toxicity recommends its use only in cases of multidrug resistance in the antibiogram. Some authors advocate a monotherapy (3rd-generation cephalosporin or fluoroquinolones) with excellent results in the limited MEO form. Control of diabetes is very important. The duration of intravenous therapy ranges from 4-6 weeks. In our experience, extending oral antibiotic treatment (fluoroquinolone) for an average of 6 weeks is very important. The suspension of treatment requires regular monitoring until there is complete clinical recovery and normalisation of the Ga-67 scintigraphy.

Mortality has currently decreased from 30%-40% to 20%.10,13,14 Recurrences may occur up to 1 year after the end of the treatment; consequently, it is considered necessary to maintain regular, prolonged patient monitoring.
Conclusions

Malignant external otitis is a rare but severe illness that can occur as a complication of external otitis in diabetic and immunocompromised patients. It can be fatal if not properly treated.

Early diagnosis and treatment of temporal osteomyelitis is essential for the prognosis of the disease.

Treatment, if the culture is positive, must be established on the basis of the antibiogram, given the emergence of resistances to ciprofloxacin.

Conflict of interest

The authors declare no conflict of interest.

References