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Research paper

Clinical presentation and management of mycetoma in gezira mycetoma center in Sudan

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Abstract

Background: Mycetoma is a neglected tropical disease characterised by deformity and disabilities with various medical, health, and socioeconomic impacts on the affected communities. It is a common health problem in Gezira state in Sudan.
Objective: This study was conducted to review the clinical presentation and management of mycetoma in Gezira Mycetoma Center in Medani, Sudan.
Methodology: This was a prospective descriptive health facility-based study conducted among 100 patients diagnosed with mycetoma attended to Gezira Mycetoma Center during the period from October 2014 to Sept. 2015. Variable checked was demographic characteristic, clinical presentation, types of mycetoma, and types of surgery done.
Results: The commonest age was 20-40 years, which represents 49(49%). Males were 76(76%). Participants were mostly farmers or animal breeders with percentage of 31% and 12% respectively. All patients presented with a swelling (100%) and mostly with discharge in a sinuses (75%).The vast majority of patients reside in Gezira State (82%). Eumycetoma was reported in 98% of cases versus 2% actinomycetoma. Diagnosis depended on clinical examination mainly and X-ray for bone involvement which was reported in 15%. All cases underwent surgical intervention in the form of wide local excision (81%), amputation (17%) and debulking (2%).
Conclusion: The study concluded that most of the patients presented late, with history of inadequate management.

Keywords: *Mycetoma; Recurrence; Amputation.*

1. Introduction

Mycetoma is a unique neglected tropical disease. Mycetoma is a chronic subcutaneous granulomatous lesion caused either by true fungi (eumycetoma) or by higher bacteria, mainly aerobic actinomycetes (actinomycetoma) (Zijlstra et al. 2016). It was first described by Gill of Madura in south India in 1842, hence the name 'madura foot'. In 1860 Carter introduced the term mycetoma ('fungal tumor') to indicate the origin of the disease (van de Sande 2013).
Mycetoma has a world-wide distribution but this is extremely uneven. It is endemic in many tropical and subtropical regions. It prevails in the mycetoma belt that stretches in a band between the latitudes of 150 South and 300 North (Fahal & Sabaa 2010). The belt includes Sudan, Somalia, Senegal, India, Yemen, Mexico, Venezuela, Columbia, Argentina and others. The mycetoma belt encases an area of forest trees and savannah, the dominant plants being various species of Acacia in addition to a variety of other thorny trees. The geographical distribution of mycetoma and its individual causative organisms shows considerable geographical variations, which can be convincingly explained on an environmental basis. The current study aimed to review the clinical presentation and management of mycetoma among 100 patients attended to Gezira mycetoma center.

2. Material and methods

This was a prospective descriptive health facility-based study conducted among 100 patients diagnosed with mycetoma attended to Gezira Mycetoma Center during the period from October 2014 to Sept. 2015. Sample size was determined by total coverage method to include all patients attended during the study period and they were 107 patients, the response rate was 100%, but after excluding cases with missed data the final sample size was 100 participants.
Statistical analysis was performed via SPSS software (SPSS, Chicago, IL, USA). Continuous variables were compared using student's t test (for paired data) or Mann–Whitney U test for non-parametric data. For categorical data, comparison was done using Chi-square test (X2) or Fisher's Exact test when appropriate. A P value of <0.05 was considered statistically significant.
Ethical clearance and approval for conducting this research was obtained from the general manager of the center and informed written consent was obtained from every respondent who agreed to participate in the study. The potential participants were clearly assured that their participation in this study was voluntary and that they could withdraw at any stage and that any data obtained would be treated confidentially and would be used for the purpose of the research only.

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3. Results

The commonest age was 20-40 years, which represents 49(49%). Males were 76(76%). Participants were mostly farmers or animal breeders with percentage of 31% and 12% respectively. The Demographic characteristics of patients showed in Table (1). It showed age distribution, male: female ratio, residence and occupations of patients. All patients in the study complained of swelling (100%), among whom 39(39%) reported duration of more than one year, 32(32%) complained for less than 6 months and 29(29%) complained for 6-12 years. Most of the patients (75%) presented with discharge in a sinuses. The vast majority of patients reside in Gezira State (82%). A history of previous operation (recurrence) was reported positively in 39(39%) of patients. Eumycetoma was reported in 98% of cases versus 2% actinomycetoma. Diagnosis was depended on clinical examination mainly and radiography for bone involvement which was reported in 15%. All cases underwent surgical intervention in the form of wide local excision (81%), amputation (17%) and debulking (2%). The heath personnel who did the previous operations and the health facilities were operation done were shown in Table 2. Table 3 Showed that the classifying operations done for mycetoma patients.

Table .1: Shows the Demographic Characteristics of Participants (N=100)

Demographic characteristics	Frequency	Percentage
Age distribution		
< 20	29	29.0
20-40	49	49.0
> 40	22	22.0
Sex		
Male	76	76.0
Female	24	24.0
Residence State		
Elgazira	82	82.0
Senar	7	7.0
Elgadarif	4	4.0
Kasala	2	2.0
others	5	5.0
Occupation		
farmer	31	31.0
animals breeder	12	12.0
House Wife	16	16.0
Student	26	26.0
Others	15	15.0

Table .2: Shows Details about the Place Where Surgery Done and the Operator

Where operation done		
Health Center	7	18%
Rural Hospital	30	76.9%
Teaching Hospital	2	5.1%
Total	39	100%
Who did operation		
Specialist	2	5.1%
General Practitioner	28	71.8%
Medical assistant	6	15.4%
Nurse	3	7.7%
Total	39	100%

Table .3: Shows Type of Surgery Done

Operation	Frequency	Percentage
WLE	71	71.0
WLE+ Skin graft	10	10.0
Amputation	17	17.0
Debulking	2	2.0
Total	100	100.0

4. Discussion

Demographic characteristics of participants revealed that, the commonest age was 20-40 years who represented nearly half of studied group (49%), males predominated (76%). This is compatible with literature which reported that, males are affected more often than females with the ratio being 3.7 to 1. This disease usually affects adults between 20 and 40 years of age, but children and elderly may also be affected in endemic regions (Fahal 2004). Higher rate among young to middle aged and males might be due to nature of their occupation which exposes them to infection since the predominant of patients were either farmers or animal breeders (43%), also, residence in Gezira state might be an assisting factor since it is an endemic area.

The slow growing and painless infection have impact on late attendance to clinic, most patients attended with swelling for more than 12 months (39%), followed by those who delayed for less than 6 months (32%). Other factors that, might contribute delayed attendance are misdiagnosis, patients awareness and accessibility to health facility. This agrees with what concluded earlier by Fahal AH and colleagues who reported that, mycetoma patients tend to present late with massive disease due to multifactorial factors (Fahal et al. 2015). Vast majority of cases reported to have the mycetoma at the lower limbs (82%), all other cases reported to have the lesion in the upper limbs (18%). This is consistent with the last updated study in Sudan in 2015 by Fahal A, et al who found that, the foot (76%) and hand (8%) were the most commonly affected sites (Ahmed et al. 2015). But they reported less frequently affected sites such as leg and knee (7%), thigh (2%), buttock (2%) and arm and forearm (1%).

Sinuses was reported in vast majority of patients (93%), colour of discharge was mostly black (75%), followed by yellow discharge which was seen in 15% of cases. Similar findings were reported by Fahal, et al in 2015 who reported sinuses in 81%, and discharge was mostly black grains (78%), Eleven percent of the grains were yellow, eight percent were white and two percent were red (Hay & Fahal 2015).

Family history of mycetoma was reported in few cases (8%), and this is similar to findings of Fahal, et al in 2015 who reported 12% positive family history of mycetoma (Fahal et al. 2015), and they justified by mentioning that, there is no explanation, but patients share the same epidemiological risk factors.

According to patients' answer most of them reported that, mycetoma is endemic around (69%), Sudan in general is considered as one of the highest endemic areas in addition to Mexico, and they both reported prevalence of 0.15 and 1.81 cases per 100,000 inhabitants, respectively as reported by Wendy W, et al in 2014 (Fahal et al. 2014a).

A considerable percentage of patients in the current study reported to have previous history of operation (39%) which were mostly done in rural hospital (76.9% out of 39 cases), and they were done by GPs (71.8%), the secondly available health facility and health providers were health centers and medical assistant (18% and 15.4% respectively), this might indicate unavailability of consultants in most areas. Putting in consideration that, many other patients have problem of accessing any type of health facility, as reported about management of myceteoma in Sudan; scarcity of medical and health facilities in rural endemic areas and the patients' low socio-economic status.

Some cases reported to have a bony involvement (15%), which complicates clinical management, leaving surgical amputation as the most likely treatment option. A similar finding was reported by Fahal, et al who found bone destruction in 794 cases (17%), but higher rate of bony involvement was reported in case report which was found in 5 patients out of 6 (Fahal et al. 2014b).

Classifying the lesion showed that, all cases were diagnosed as Eumycetoma, except two cases which were actinomyces (98% and 2% respectively). This is compatible with the study of Fahal, Elsheikh Mahgoub and colleagues in Sudan who found that, eumycetoma was diagnosed in 73% of patients, actinomycetoma in 14%, while in 13% no diagnosis was established (IA et al.

1996). Also, literature review showed the predomination of actinomyces reporting that, Infection can be caused by true fungi in 40% cases where it is known as eumycetoma and by filamentous bacteria of order actinomycetes (actinomycetoma) in 60% cases (Boiron et al. 1998).

All patients, except one received pre-operative medical treatment (99%), in form of antifungal, antibiotics and folic acid. All patients in the current study were treated surgically, out of them 81% underwent wild local excision (WLE), and only 10% who were applied skin graft due to total excision and small in size. Other operations included are amputation which was done for 17%, and debulking (2%). It was reported that, eumycetoma is well encapsulated and great care must be exercised not to rupture the capsule, which may lead to recurrence by transferring the fungal element into other parts of the operative field (Suleiman et al. 2016). Actinomycetoma has an ill-defined border; therefore a margin of healthy tissue should always be excised with the lesion.

5. Conclusion

The study concluded that most of the patients presented late, with history of inadequate management. We suggest that the attitude of patients towards mycetoma has to change through continuous but targeted public education.

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