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Prevalence of HIV Infection in Patients with TB Spine Admitted to the University Teaching Hospital, Lusaka, Zambia

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Abstract

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Background: Extra pulmonary TB is an AIDS defining opportunistic infection in patients with HIV infection. TB spine is the commonest form of bone TB and whose clinical picture depends on the site and the presence of HIV infection

Method: This was a retrospective review of patient records (n=101) over a two-year period (2008-2010) at the University Teaching Hospital, Lusaka, Zambia. Clinical and radiological features, laboratory data were analyzed

Results: One hundred and one patients (57 male: 44 female) had TB spine in this period. The mean age was 37.22 ± 14.29 years. The main presenting complaint was backache in 71(70.3%) patients and the mean duration of symptoms was 2.68 ± 1.23 months. The Gibbus was present in 77 (76.24%) of the patients while neurological deficit was identified in 32 (31.6%) patients. The lumbar spine the most affected in 64(63.4%) patients. The mean ESR was determined to be 59.43 ± 32.23 mm/hour. The prevalence rate of HIV infection in the patients with TB spine was 24.8 %. The average CD4 count was found to be 262± 121.3 cells/µl.

Conclusion: The prevalence rate of HIV infection (24.8%) is higher than that obtaining in the Zambian general population (13.7%) but lower than the general prevalence of HIV infection in patients with TB (68%).

Keywords: *TB spine, HIV infection, Gibbus*

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INTRODUCTION

It is estimated that 3 million people die each year from TB and its associated complications [1]. TB is therefore by far, the world's leading infectious cause of death. It is caused by mycobacterium tuberculosis, a bacillus described by Koch in 1882.

TB has been branded as one of the great mimickers because it can infect virtually any organ in the body. Generally, TB infection is said to be either pulmonary or extra pulmonary. Pulmonary TB accounts for over 85% of all TB infections. Extra pulmonary TB can manifest as meningitis, orchitis or as a pleural effusion. Other forms of extra pulmonary TB infection include TB abdomen as well as bone and joint TB.

Amongst the patients with extra pulmonary TB, 1-8% of them have osseous disease with vertebral involvement in 30-50% of these patients. Furthermore, approximately 50% of these patients with osseous disease also have pulmonary disease [2].

The introduction of ant tuberculosis chemotherapy in the 1940's saw a marked reduction in the incidence of TB. But since the advent of HIV infection, there has been an upsurge in the incidence of TB, particularly in sub–Saharan Africa which has the highest prevalence of HIV infection in the world. In Zambia for example, the prevalence of HIV infection is 14.3 % [3].

TB is a major opportunistic infection in HIV disease. In Lusaka, about 70% of TB patients also have HIV infection [4]. In South Africa, on the other end of the spectrum, the TB/HIV co-infection seroprevalence is 28%7. TB and HIV infection are because of this referred to as 'the cursed duet.' This is because TB is the most common opportunistic infection in HIV patients 8and it is the most common cause of death.

The purpose of this study was to determine the prevalence of HIV infection, to illustrate the demographic characteristics and identify the most common site of TB infection in TB spine patients admitted to the University Teaching Hospital, in Lusaka, Zambia.

METHODS AND MATERIALS

This was a cross-sectional retrospective study of the descriptive type with the review of the medical records of patients diagnosed with TB spine admitted to the University Teaching Hospital of Lusaka, Zambia from October 2008 to October 2010 were analyzed. The setting for the study were the following wards and clinics; medical (E block), general surgical (G block) wards, orthopaedic wards (C block) and clinic 3 (Orthopaedic clinic) and Chest clinic at the University Teaching Hospital in Lusaka. One hundred and nineteen patients were diagnosed with bone and joint TB from October 2008 to October 2010, of these 101 were enrolled in the study. The variables analyzed were; Demographic (sex, age), Clinical features (presenting complaint, duration of symptoms, presence of Gibbus, patient is on ART), Radiological features (vertebral level TB spine, disc space, anterior collapse of vertebrae, presence of paravertebral abscess, erosion of endplates), Laboratory features (ESR for all patients, HIV test results, CD4 count for patients who were sero-positive). The data collected was recorded on an information sheet and statistically analyzed by using SPSS 17.

RESULTS

There 101 patients with TB spine over a 2-year period (October 2008 – October 2010). Of the 101 patients, 57 (56.4%) were male and 44 (43.6%) were female. The average age for a patient with TB spine was 37.22 ± 14.29years (range 16-73 years).

The main presenting complaint was backache with 71 (70.3%) patients presenting with it. Twenty-one (20.8%) patients came in with the complaint of having a lump, while 7 (7%) patients came in with a fever. The initial complaint was still backache with 41 (40.6%) patients having such a history while 29 (28.7%) had noticed a lump on their back. The average duration of the complaints was 2.68±1.23 months (range 1-6 months) with 39.6% of the patients presenting with a history of 2 months duration. TB spine was found mostly involving the lumbar spine in 64 patients and 26 patients had thoracic spine TB. Cervical spine TB was in 4 patients. The commonest level was L2. The presence of the Gibbus was found in 77 (76.2%) patients. Paraplegia and or paraparesis were found in 32 (31.68%) patients with TB spine. Of the 25(24.8%) patients with HIV infection 18 (72%) of the patients were on ART.

HIV test was done on admission and 25(24.8%) patients were sero-positive for HIV. The average ESR was 59.34 ± 32.23 mm/hour (range 4-156mm/hour). The mean CD4 count in patients who were infected with HIV and TB spine was 262 ± 121.3 cells/µl (range 56 – 444 cells/µl).

The common radiological feature was reduction of disc space with 93 (92.1%)

radiographs having the feature. The other features were paravertebral abscess 48 (47.5%) radiographs, erosion of disc space 64 (63.4%) radiographs and anterior vertebral body collapse 87 (86.1%) radiographs.

DISCUSSION

In this study 101 patients were reviewed. The average age of the patients was 37.22 ± 14.29 years. Figure 2 shows the normal age distribution. TB spine in developing countries has been shown to afflict older children and young adults with a range of 33-35 years. The developing world in this case includes parts of Asia and sub-Saharan Africa. In a study done in Nigeria, the average age of patients with TB spine was found to be 27 years [5]. In the developed world the average age for patients with TB spine is higher. In Taiwan, the average age was 64 years [6]. In Thailand the average age was 50 years [7]. The results obtained by our study present a picture which conforms to findings from the developing world.

From the 101 patients in the study, 57 (56.4) were males while 44 (43.3) were female. It was the expectation of the study that females were more affected by TB spine. This expectation was supported by findings in the general population where there are more females than males. The afore mentioned Nigerian study showed that 24 were males while the females were 26 9. In the Taiwan study there was an equal number of males and females (24:24) [8]. In Karachi, Pakistan 75% of the patients were female [9].

The main presenting complaint was chronic backache in 71 (70.3) patients. The presence of a lump was the second most common presenting complaint in 21 (20.8) patients. Backache results from the presence of protective muscular spasms which aim to protect the affected level. Chronic backache has been shown to be the most common complaint in patients with TB spine. Back pain is caused by many conditions like degenerative disc disease, disc prolapsed, infections other than tuberculosis and developmental deformities like kyphosis and scoliosis.

The duration of symptoms was established to be 2.68 months (2.68 ± 1.23 months). In younger patients the duration of symptoms is shorter than in the aged. In the elderly studies have shown that the average duration of symptoms is about 6-8 months [10]. This has been attributed to the presence of chronic backache which has a wide range of differentials in the elderly patients. It is difficult to diagnose early TB spine in an elderly patient because backache can be caused by degenerative changes and osteoporosis. It is because of this that clinicians have to be diligent when approaching an elderly patient with chronic backache.

One of the pathognomic features of TB spine is the presence of a Gibbus. In this study 76.4% of the patients had a Gibbus. The Gibbus shows kyphotic deformity secondary to collapse of the affected vertebral bodies anteriorly. The Gibbus is worse in the thoracic spine because the collapse of the vertebral bodies is anterior coupled with the thoracic being naturally kyphotic.

In this study the lumbar spine (63.4%) was mostly involved and L2 was the most affected vertebra. Cervical spine involvement was the least involved (4%). Literature over the years shows that the thoracolumbar region is the most affected vertebrae [11].

Patients with TB spine generally present with raised ESR. In Figure 6 the histogram shows the normal distribution of the ESR. This study showed that the mean ESR was 59.34 ± 32.23 mm/hour (4-156). In some studies, it is as high as 72mm/hour [12]. Raised ESR though nonspecific suggests that there is a chronic inflammatory process. It has been suggested that in TB spine the ESR is usually over 40mm/hour. ESR is an important tool for arriving at the diagnosis but should not be the main diagnostic investigation.

This study found a seroprevalence of 24.8%. This prevalence is higher than that prevailing in the general population 14.7% [13]. In Nigeria the seroprevalence was found to be 28.12% while prevalence in the general population is 3.6% [14]. Nigeria is considered to be a low prevalence country and this has been attributed to the effective intervention programmes. In KwaZulu Natal at a hospital that cares for TB spine patients the HIV prevalence rate was 28% [10]. In South Africa, the HIV prevalence is 17.8% .

CD4 count was done for all the patients who had a positive HIV test. The average CD4 count was found to be 262 ± 121.3 cells/µl. WHO clinical staging of HIV infection classifies HIV infection with osseous TB as being in stage 4 disease, therefore TB spine in HIV infection is AIDS defining. In the CDC laboratory classification stage IV disease has a CD4 count of less than 200 cells/µl. The average CD4 count of 262 is higher that the AIDS defining level. Fifteen patients (60%) of those who had HIV infection had CD4 count below 200 cells/µl. According to the CDC, AIDS is defined when the CD4 count is

less than 200cells/µl and this is when AIDS defining opportunistic infections like TB spine occur and this was the expected outcome of this study. Seventy two percent of the HIV positive were on ART. Patients on ART have lowering of their viral load with a complementary rise in the CD4 count. The finding of the average CD4 count (262cells/µl) being higher than 200cells/µl (AIDS defining - CDC) may have arisen due to the compounding effect of the patients being on ART. Though the average CD4 count is 262cells/µl that makes the common CDC stage to be the intermediate stage (200-500cells/µl). This still suggests that there is some lowering of the CD4 count in patients with TB spine. The study did not meet this expectation, but cannot still arrive at the conclusion on the CD4 count at which TB spine occurs.

The most common radiological feature was disc space reduction seen on 93(92.1%) radiographs). Anterior vertebral body collapse was seen in 87 (86.1%) radiographs. The erosion of the vertebral endplates is a known feature of TB spine and 64 (63.4%) radiographs has this feature. A near pathognomic feature is the presence of paravertebral shadowing suggesting a paravertebral abscess. The radiological features in patients with TB spine and HIV did not differ from those with TB spine alone. In a Taiwan study the common radiological finding was the presence of an abscess (77.1%) and vertebral collapse (68.8%) 10. Plain radiography remains the cornerstone of investigative imaging for the diagnosis of TB spine. Other modalities like CT scan and MRI are also helpful and enable earlier detection of the disease process. The only limiting factor is the cost of carrying these new modalities. The other radiological feature that was not analyzed by this study was the degree of kyphotic deformity as a result of TB spine. The degree of kyphotic deformity is very cardinal when planning surgical intervention.

The patients in the study were started on ATT. One of the limitations of the study is that it did not look into the outcome of ATT. Surgical intervention is also an option to patients with TB spine.

CONCLUSION

TB spine is a disease which mostly affects the young adults with an average age of 37 years.
Patients present with a history of chronic backache as the commonest complaint with an average duration of symptoms of 2 months
There is no conclusive data from this study to suggest that TB spine only occurs at CD4 count below 200 cells/µl.
Disc space reduction and anterior collapse were the commonest radiological features
The sero-prevalence for HIV in patients with TB spine was 24.8%

DECLARATION

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Competing interests There were no competing interests from all authors in this study.

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