

# Potts Disease In Children And Adolescents In Calabar, Nigeria

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## Citation

F Odey, U Umoh, M Meremikwu, A Udosen. *Potts Disease In Children And Adolescents In Calabar, Nigeria*. The Internet Journal of Infectious Diseases. 2006 Volume 6 Number 1.

## Abstract

**Study Design:** This is a retrospective study of tuberculosis of the spine over a 12 year period.

**Objectives:** To highlight the importance and clinical presentations of Pott's disease in this locality.

**Setting:** The study is conducted in the pediatric ward of the university of Calabar teaching hospital, Calabar, Nigeria over a 12 year period.

**Method:** The data were extracted from patient case files obtained from the medical records in the hospital. Radiological findings of the patients were also reviewed.

**Results:** Of the 113 patients admitted into the pediatric wards with tuberculosis during the period of this study, 16 (14 %) had Pott's disease. Fifty-six (56) percent of this were under five years of age. The commonest symptom was back-swelling (68.8%) while the commonest physical finding was Gibbus (94%). A quarter (25%) of the patients had concurrent active pulmonary disease. In all the patients at least two contiguous vertebrae were affected.

**Conclusion :** Pott's disease is an important form of tuberculosis seen among children in Calabar, Nigeria. Early detection and effective treatment would minimize morbidity and disability.

## INTRODUCTION

Tuberculosis (TB) is a leading cause of deaths in children globally.<sup>1,2,3,4</sup> The HIV/AIDS pandemic has immensely affected the epidemiology of the disease given the high incidence among those affected by HIV/AIDS.<sup>1,2</sup> Tuberculosis of the vertebral spine (Pott's disease) is the commonest presentation of tuberculosis of the bone.<sup>3</sup> It is a widely recognized pattern of presentation of the disease and is associated with spinal cord compression and axial deformity.<sup>5</sup> The prevalence of Pott's disease in Nigeria is unknown but it accounted for 6.7% of TB in children in one hospital-based report.<sup>5</sup> Survey of tuberculosis in 3 major hospitals in Calabar that treat the disease shows that Pott's disease accounted for about 30% of extra-pulmonary cases of tuberculosis.<sup>6</sup>

Delayed treatment of TB spine could result in such avoidable poor outcome as longstanding disability from

spastic paraplegia.<sup>7,8</sup> This study is aimed at highlighting the clinical presentation of this curable condition, which is capable of causing significant morbidity and disability if the diagnosis or treatment is delayed.

## PATIENTS AND METHODS

**Study design:** Patients with TB of the vertebral spine were reviewed retrospectively over 12 years from January 1993 to December 2004 and the clinical features and radiological findings were described.

**Setting:** This study was carried out on hospital records of children admitted with TB spine to the University of Calabar Teaching Hospital, Calabar, southeastern Nigeria. The hospital is a referral center for the whole of Cross River State with a population of 2.8 million. It has bed capacity of 300, over 30% of which is occupied by children. The hospital runs a directly observed therapy short course (DOTS) unit, which is one of the networks of DOTS units

supported by the National Tuberculosis and Leprosy Control Programme.

The predominant occupation of the inhabitants is subsistence farming and a smaller percentage are civil servants. There are very few industries in the area and the bulk of the population belongs to the low-income group.

### **METHODS OF DATA COLLECTION**

Information was retrieved from patient hospital records. Data extracted include age, sex and clinical features. Radiological findings and Laboratory findings such as haemoglobin, total and differential white blood cell count as well as the erythrocyte sedimentation rate (ESR) were also reviewed.

Patients reviewed were those aged less than 15 years, who had clinical, laboratory and radiological evidence of tuberculosis of the spine. Those excluded from the study were patients whom the diagnosis of tuberculosis spine was unclear and those who had incomplete records.

Diagnosis of tuberculosis was based on the clinical symptoms and signs, supportive evidence from tuberculin skin test (Mantoux test > 10mm), chest radiograph and histological report of lymph node biopsy. The diagnosis of Pott's disease was confirmed from plain radiograph of the vertebrae showing narrowing of intervertebral space, destruction/collapse of the vertebrae with or without paravertebral shadows indicative of cold abscesses. Bacteriological confirmations by mycobacterium culture could not be done and the hospital also lacked the facilities for computerized tomographic scan and magnetic resonance imaging.

Protocols recommended by the National Tuberculosis and Leprosy Control programme of the Federal Government of Nigeria were used to treat patients. This is an 8 month regimen consisting of four drugs (isoniazid, rifampicin, pyrazinamide and streptomycin or ethambutol for older children. The four drugs are used in the intensive phase and two in the continuation phase., Treatment was largely medical but cases were jointly managed with orthopaedic surgeons who advised on orthopaedic interventions such as, use of plaster jackets when the need arises.

### **RESULTS**

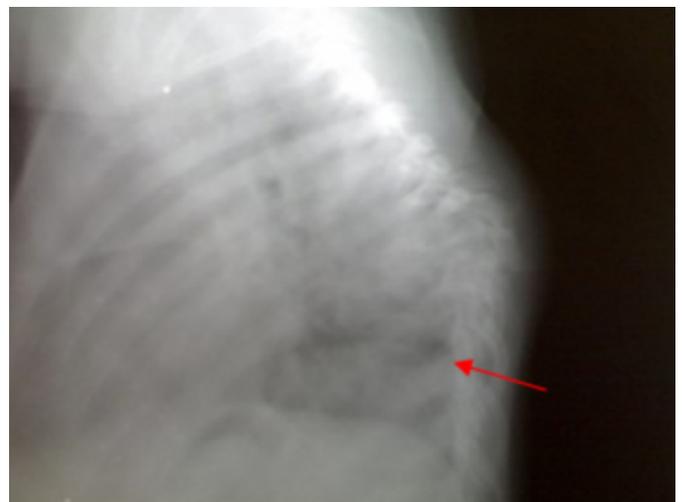
The total of 113 patients were admitted into the pediatric wards of the University of Calabar Teaching Hospital with tuberculosis during the period of this study. About thrice this

number not requiring hospitalization were treated as outpatients in the DOTS units of the hospital. In the same city in 2004, 720 cases of tuberculosis were seen at the State Infectious Disease Hospital (IDH) of which fifty-two (7.2 %) were children aged less than 15 years. All cases of suspected TB of the vertebral spine were admitted for evaluation and anti-tuberculosis therapy at the intensive phase.

Sixteen (16) patients with confirmed Pott's disease met the inclusion criteria for this study and were enlisted. Thus, 14% of all hospitalized cases of tuberculosis during this period were due to Pott's disease. (Figure 1, 2 &3).

### **Figure 1**

Figure 1: LATERAL VIEW OF COLLAPSED T9 – T11



**Figure 2**

Figure 2: AP VIEW OF SAME PATIENT



**Figure 3**

Figure 3: Gibbus at L3-L4 in a 12 year old boy



Table 1 shows that there was equal sex distribution and fifty-six percent (56%) of the patients were under five years of age at the time of presentation. The mean age of patients was 5.24 years and the age ranged from 1 to 12 years.

**Figure 4**

Table 1: Age, Sex and Site of affection of children with Pott's disease in Calabar, Nigeria.

Case Number	Age	Sex	Site
1	7 years	M	T <sub>12</sub> -L <sub>2</sub>
2	12 years	M	L <sub>3</sub> -L <sub>4</sub>
3	1.3 years	F	T <sub>2-3</sub>
4	3.5 years	M	T <sub>12</sub> -L <sub>1</sub>
5	1.4 years	M	T <sub>5-7</sub>
6	7 years	F	T <sub>12</sub> -L <sub>1</sub>
7	6 years	F	T <sub>12</sub> -L <sub>3</sub>
8	1 year	F	T <sub>12</sub> -L <sub>3</sub>
9	10 years	F	T <sub>12</sub> -L <sub>1</sub>
10	2.5 years	M	C <sub>6-7</sub>
11	3.5 years	F	T <sub>5-7</sub>
12	1.8 years	F	T <sub>9-11</sub>
13	4.5 years	M	L <sub>1-3</sub>
14	10 years	M	L <sub>4-5</sub>
15	4 years	F	L <sub>4-5</sub>
16	8.4 years	M	T <sub>4-9</sub>

Symptoms and signs: Table 2 shows that the commonest symptom observed in this series was back swelling (94%) presented with gibbus deformity. (see table 3).

**Figure 5**

Table 2: Presenting symptoms in children with TB of vertebral spine bone in Calabar, Nigeria.

Symptoms	Individual patients affected																Total (%) affected (n=16)		
	Patient ID numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	
Fever	-	+	-	+	+	-	-	+	-	+	+	+	-	-	-	-	+	8	50%
Cough	+	-	+	-	+	+	+	-	-	-	-	+	+	-	-	-	-	6	37%
Inability to walk	-	-	+	-	+	+	+	+	+	-	+	-	-	-	-	-	+	7	43.7%
Weight loss	-	+	+	+	-	-	+	-	+	-	-	-	-	-	-	-	+	6	37%
Night sweats	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	3	18.7%
Loss of appetite	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	2	12.5%
Convulsion	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	1	6.2%
Chest pain	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	2	12.5%
Difficulty in breathing	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	2	12.5%
Back swelling	-	+	+	-	-	+	+	+	+	-	-	+	+	+	+	+	+	11	68.8%
Body swelling	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6.2%
Inability to flex neck	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	1	6.2%
Back ache	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	2	12.5%

**Figure 6**

Table 3: Physical and basic laboratory findings of children with Pott's disease in Calabar, Nigeria.

Clinical Signs	Individual patients affected																Total (%) affected (n=16)		
	Patient ID numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	
Pallor	-	+	-	+	+	-	-	+	+	+	-	-	-	-	-	-	+	7	43.7%
Gibbus	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	15	94%
Underweight	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	4	25%
Lymphadenopathy	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	12.5%
Hypertonia	-	-	+	-	-	+	+	-	-	-	-	+	-	-	-	-	+	5	31.2%
Hypotonia	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	3	18.7%
Hyperreflexia	-	-	+	+	-	+	-	-	+	+	-	-	-	-	-	-	+	5	31.2%
Hyporeflexia	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	2	12.5%
Sustained ankle clonus	-	-	+	+	-	-	-	-	+	+	-	-	-	-	-	-	-	4	25%
Crepitation in lungs	+	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	4	25%
Hepatomegaly	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	4	25%
Splenomegaly	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	2	12.5%
Tuberculin reaction >10mm	-	-	-	+	-	-	-	-	+	+	+	+	+	+	+	+	+	8	50.0%
ESR > 10mm/Hr	-	+	-	+	+	-	+	-	+	-	-	-	-	-	-	-	-	5	31.2%

Other clinical features were fever in 50% of them; inability to walk and pallor in 43.7%, cough and weight loss was recorded in 37% of the patients. The commonest neurological signs were hypertonia and hyperreflexia (31%), sustained ankle clonus (25%) and hypotonia (18%). Difficulty with breathing and pulmonary crepitations were found in 12.5% and 25% of the patients respectively. Significant lymphadenopathy was noted in 12% of patients. One patient presented with convulsion and neck stiffness.

**REONTGENOGRAPHS**

The x-rays of the patients' vertebral spine demonstrated destruction of the vertebral body in all the patients reported in this series. The thoracic spine was the most commonly affected part of the spine and was involved either alone or in combination with other parts in 75% of the subjects. Figures 1 and 2 show X-ray of a patient in which T<sub>9</sub>-T<sub>11</sub> was affected. The lumbar spine was affected in 56%. Figure 3 is a photograph of a 12 year old boy affection of L<sub>3-4</sub>. The cervical spine was affected in only 1(6%) of patients. The disease affected at least two contiguous vertebral bodies in all the patients.

Concurrent pulmonary affection was noted in 25% of patients. One patient had tuberculous meningitis in addition to the Pott's disease. Positive tuberculin reaction was seen in 50% of the patients and 31% had high ESR (>20mm/hr).

**DISCUSSION**

Pott's disease accounted for 14% of all hospitalized cases of tuberculosis seen in this hospital during this period. The

prevalence is within the range of that reported from Singapore,<sup>10</sup> where skeletal tuberculosis accounted for 10-20% of all extra-pulmonary cases. This was lower than the 30% reported by a collaborative review of extrapulmonary tuberculosis in three hospitals in Calabar.<sup>6</sup> Although, this is lower than the 6.7% reported from an hospital based study in Ibadan Nigeria,<sup>3,5</sup> the disease no doubt constitutes an important percentage of the burden of tuberculosis in this community. It has been suggested that the high contribution of Pott's disease to the extra pulmonary cases may be due to the ease of recognition of the associated vertebral collapse (gibbus) when it occurs.<sup>6</sup>

In this study over half (56%) of the patients affected by Pott's disease were less than five years old (Table 1.). In the series reported by Campos et al,<sup>11</sup> 67% of the patients were less than 6 years old and two subjects were infants. The findings of these two studies are in keeping with what is already known that the burden of tuberculosis is high in children, particularly the under-fives.<sup>3</sup> For effective prevention of the disease in developing countries, efforts should be targeted at this age group. The younger patients have been shown to have better response to treatment as well as better prognosis than the older patients.<sup>11,12</sup>

This study showed equal males/females prevalence while other studies found either male or female preponderance of the disease.<sup>12,13,14</sup> However, it should be noted that the studies that showed female preponderance may be more representative since it covered a longer period (between 15 and 30 years) and with larger sample sizes.

Swelling of the back (gibbus) was the most common clinical feature in this study. In the study from Turkey,<sup>8</sup> gibbus was the second commonest symptom after paralysis and Ikem et al,<sup>15</sup> in Ife found it as the fourth. The patients in this series reported late to hospital hence the high rate of spinal deformity on presentation. In other places where patients attend hospital early, back pain was the commonest presenting symptom.<sup>7,15</sup> Our patients may have sought help from non-formal providers like drug vendor or traditional herbalist before presenting to hospital. There is need to educate the populace on the early symptoms of Pott's disease like back pain, and need for patients with back pain to report promptly to hospital.

Fever was the second commonest clinical feature noted and was seen in 50% of patients in this study. Although fever is a non-specific feature in Pott's disease, its presence suggests that the tuberculosis was active at the time of presentation.

Tuberculosis is known to cause low grade fever. Twenty-five (25%) of the patients had associated tuberculous pneumonia. Ikem et al,<sup>15</sup> reported a slightly higher percentage of 26.5%. From these studies, it appears that about a quarter of patients with Pott's disease may have active pulmonary tuberculosis, some of which may have been disseminated tuberculosis.

Inability to walk (Pott's paralysis) which was the commonest symptom in the report from Turkey was the third commonest in this report.<sup>8</sup> In the same study, gibbus deformity, which was the commonest symptom in this study, was seen in only 46% of the patients.<sup>8</sup>

There is need to educate the public on the importance of reporting all persistent back pain to health personnel for proper assessment. Health personnel especially at the primary and secondary levels of care should be taught to do thorough examine of the back of patients complaining of back pain in order to identify those with early deformities. Medical personnel and parents should not ignore the complaint of back pain in children (table 2). The DOTS programme of the National TB and Leprosy Control programme now provides anti-tuberculosis drugs free of charge, but this service should be made to reach many more rural communities. Implementation of effective health promotion strategies including immunization against childhood diseases (notably BCG and measles vaccines) could help reduce the incidence of disseminated TB (which sometimes includes Pott's disease and paralysis).

### **ACKNOWLEDGEMENTS**

The efforts of the staff of Paediatric units of the University of Calabar Teaching Hospital is hereby appreciated. Thanks to the management of the University of Calabar Teaching Hospital, Calabar for allowing us to carryout this study in the hospital.

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