

## **ORIGINAL ARTICLE**

### **Pyomyositis in north - eastern Nigeria: a 10-year review**

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#### **Abstract**

**Background:** Pyomyositis is a suppurative disease of skeletal muscle and a well-known disease with frequent occurrence in the tropics and subtropics, which continues to cause significant morbidity. Despite several studies of the disease in various regions of the tropics, there has been none from the northeast region of Nigeria, consisting of a largely rural population where the climate is hot and dry with little annual rainfall.

**Methods:** A retrospective study of all patients seen and treated for pyomyositis in the University of Maiduguri Teaching Hospital from April 1990 to April 2000 was undertaken.

**Results:** Fifty four patients with pyomyositis were seen and managed comprising 36 Males and 18 Females (M: F ratio 2:1). Two peak age incidences of 6-10 years and 31-40 years were noted. Most were from a labouring population and presented with a fully evolved disease affecting the large and powerful muscles of the thigh and calf in 59.7% of cases, the glutei in 12.9% and the trunk in 9.7%. The smaller muscles of the arm and forearm and head and neck were rarely affected. 8 patients had multiple lesions. *Staphylococcus aureus* was cultured in 91.8% of cases sensitive to cloxacillin, augmentin, chloramphenicol and erythromycin in that order.

**Conclusion:** Prompt diagnosis, appropriate supportive therapy, effective antibiotic therapy and early drainage of abscesses have resulted in minimal mortality despite late presentation although hospital stay was prolonged.

**Key words:** Pyomyositis, north-eastern Nigeria

#### **Introduction**

Pyomyositis is a suppurative disease of skeletal muscle and a well-known disease in the tropics and subtropics, and continues to cause morbidity and mortality in these regions.

Initially thought to be a largely tropical disease is now known to also occur in Europe and North America.<sup>1</sup> Infection of skeletal muscle with *staphylococcus aureus* is responsible for the clinical picture of the disease but the factors that predispose to such an infection are still uncertain. Some of the factors thought to play a major role in its pathogenesis include intense exercise and local trauma, parasitic infections, and debilitating disease.<sup>2</sup> There are increasing reports of its occurrence in HIV infected individuals, but as to whether the relationship is causal is unclear.<sup>3-5</sup>

The disease affects both adults and children. About 40% of pyomyositis cases were children in one study from the tropics.<sup>6</sup> Despite several studies of the disease in various regions of the tropics, there has been none from the northeast region of Nigeria,

consisting of a largely rural population where the climate is hot and dry with little annual rainfall. This is a 10-year appraisal pyomyositis seen in the University of Teaching Hospital.

#### **Materials and Methods**

A retrospective study of all patients seen and treated for pyomyositis in the University of Maiduguri Teaching Hospital from April 1990 to April 2000 was undertaken.

Records were obtained from the Medical Records Department of the hospital. Other forms of abscesses and those with a definite cause were excluded from the study. On the whole, 54 cases were found suitable for inclusion in the review.

#### **Results**

Fifty four patients comprising 36 males and 18 females (M: F ratio 2:1) were seen and treated for pyomyositis during the period of review.

Age range was from 9 months - 67years with two

peak age incidences of 6-10years and 31-40years (table 1). The patients were all resident in the northeast region of Nigeria. The occupations are shown in table 2.

Pain, swelling and tenderness of the affected region were the most common symptoms. In children, loss of function of the limb or swelling of the affected region was the most common complaint. Duration of symptoms before presentation was between 12-20 days (mean of 15 days). No antecedent history of trauma was recorded in any of the patients.

Over two thirds of the patients were toxic and dehydrated with pyrexia (temperatures ranging between 37.2- 40 °C) on admission. In majority of the patients there was marked oedema and fluctuant tender swelling of the affected muscle(s).

The various muscle groups affected are shown in table 3. The thigh, gluteal and back muscles were the most commonly affected. The head and neck and forearm muscles were rarely affected. Multiple lesions were present in 8 cases.

Radiographs of the affected region/limb did not reveal an underlying bone lesion in those in which it was done. Abdominal ultrasound scan was used in the evaluation of 4 patients who had anterior abdominal wall muscle disease and showed features suggestive of the presence of intramuscular abscesses. Computed tomography (CT) scans were not routinely done because of cost restraint. Needle aspiration of the affected muscle yielded pus in all cases.

Culture reports were available in 49 patients and pure growths of staphylococcus aureus was obtained in 45, mixed growths of staphylococcus aureus and streptococci were obtained in 2, while the remaining 2 were reported as sterile. Majority showed sensitivity to cloxacillin, and augmentin and to a lesser degree erythromycin and chloramphenicol. No bacteraemia was detected in any of the 13 patients in whom blood cultures were done.

Ten patients (10%) had anaemia (Hb<10gm/dl). There was polymorphonuclear leucocytosis in majority of the patients with moderate elevation of the erythrocyte sedimentation rate. Records of HIV screening were available in 12 patients; 3 were positive for HIV antibodies however none of the 3 had features suggestive of AIDS.

Treatment was by incision and drainage of the abscess after preliminary resuscitation with intravenous fluids and antibiotic therapy, which was started pending the availability of microscopy, culture and sensitivity reports. Majority were treated with either augmentin or cloxacillin. 2 patients also received blood transfusions for severe anaemia. Abscess cavities were lightly packed with absorbent gauze and dressed daily with eusol or honey soaked gauze until filled up. There were resulting clean granulating wounds that were closed by split thickness skin grafts in 10 patients while secondary suturing was done in 3 patients.

Complications noted were graft failure in 3 of the 10 patients that had split thickness skin graft, recurrence of abscesses due to poor drainage and

inadequate wound dressings that resulted in premature closure of the abscess cavities in 7 patients.

There was one death (mortality of 1.9%); a 45-year-old man who was severely toxic and had multiple abscesses with bronchopneumonia and resulted in death on the second day of admission, presumably from septicaemia although no organism was isolated by blood culture and no autopsy was done. Duration of hospital stay was 15-42 days mean (24 days).

Table 1: Age and sex of 54 patients with pyomyositis

Age (Years)	No. (%)		Total (%)
	M	F	
<5	3	1	4 (7.4)
6-10	9	3	12 (22.2)
11-20	3	2	5 (9.3)
21-30	4	4	8 (14.8)
31-40	13	7	20 (37.0)
41-50	3	1	4 (7.4)
51-60	1	-	1 (1.9)
Total	36 (66)	18 (33)	54 (100)

Table: Occupation of 54 patients with pyomyositis

Occupation	No. (%)
Farming	11 (20.4)
Unskilled manual worker	6 (11.1)
Trading	7 (13.0)
Herdsmen	8 (14.8)
Housewives	9 (16.7)
Children	10 (18.5)
Students	2 (3.7)
Not specified	1 (1.9)
Total	54 (100)

Table 3: Sites of involvement in 54 patients with pyomyositis

Anatomical region	No. (%)
Lower limbs	
thigh muscles (quadriceps, adductors)	24 (38.7)
calf muscles	13 (21.0)
Buttocks (glutei)	8 (12.9)
Trunks	
anterior abdominal muscles	4 (6.5)
latissimus dorsi	2 (3.2)
Shoulder girdle	1 (1.6)
Arm (triceps)	1 (1.6)
Head and neck (sternomastoid muscle)	1 (1.6)
Multiple sites	8 (12.9)

## Discussion

Pyomyositis is a purulent infection of skeletal muscle and is usually caused by staphylococcus aureus. The initial reports of pyomyositis were from France and Brazil as early as the 19<sup>th</sup> century<sup>7</sup> since then the disease has been increasingly reported from various tropical and non-tropical regions. Thus Chidezi<sup>2</sup> reported 205 pyomyositis in 112 patients in Benin City Nigeria, Ladipo and Fakunle,<sup>8</sup> Ameh,<sup>6</sup> and Yusufu et-al<sup>9</sup> reported 90, 31 and 43 cases respectively on the disease in Zaria, Northern Nigeria. It is responsible for about 3-4% of hospital admissions in one report in Uganda,<sup>10</sup> and in this report, 54 cases were seen over a 10-year period. Pyomyositis therefore continues to be an important cause of morbidity in the tropics.

The exact pathogenesis of pyomyositis is still uncertain. Pyomyositis affects large and powerful muscle groups. The legs (quadriceps and calf muscles) were involved in 59.7%, the glutei in 12.9%, and the trunk in 9.7%. The arm and forearm, head and neck and shoulder girdle being rarely affected. This is a similar finding to other reports.<sup>2,6,8</sup> Most of our patients are also from a farming and labouring population, and although no history of trauma was elicited in any of them, repeated and sub clinical trauma to large muscle masses may set the stage for secondary invasion by micro organisms.

Immune suppression from varied causes has also been implicated, and there have been increasing reports of the occurrence of pyomyositis in HIV infected individuals.<sup>3,4,5</sup>

For instance, HIV seropositivity was present in 31% of pyomyositis patients compared to 5.7% in an age and sex matched control group in one study from the tropics.<sup>3</sup> It has been suggested that HIV infected individuals especially in Africa are at an increased risk of acquiring pyomyositis.<sup>11</sup> Although not all the Patients in this study were screened for HIV, 3 of the 12 that were tested for HIV antibodies were positive and this may be an early indicator of a probable association if properly studied in this environment.

The two peak age incidences noted in this study, 6- 10 years and 31-40 years and the M: F sex distribution of 2:1 agrees with other reports.<sup>2,6,8</sup>

Most of the patients in this study presented with full-blown pyomyositis with multiple abscesses in 8 patients (12.9%). Multiple abscesses have been reported in 12-60% of patients.<sup>2,8,10,13</sup> Differentiation from osteomyelitis and bone tumours in those with limb lesions were easily made by radiographic means and ultrasound scan helped define the site and nature of the lesions in patients with trunk lesions in order to exclude an intra abdominal organ abscess. Newer imaging modalities, such as gallium scanning, CT scan and magnetic resonance imaging (MRI) where available can greatly facilitate early recognition during the early presuppurative phase and enable prompt antibiotic treatment and rapid resolution of the muscle infection without need of surgical drainage when patients present early.<sup>14 - 16</sup> The dominance of one side of the body over the other as noted in

previous studies<sup>8, 12</sup> was not a notable feature in this study.

Needle aspiration of abscesses yielded pus in all cases. Staphylococcus aureus was cultured in 91.8%, mixed growths of staphylococcus aureus and streptococci were obtained in 4%. Streptococcus pyogenes, Escherichia coli<sup>2, 8</sup> and anaerobes<sup>17</sup> have also been reported as incriminating agents. In this study, most were sensitive to cloxacillin, augmentin, chloramphenicol and Erythromycin, in that order. Majority were given cloxacillin and augmentin since they were readily available and affordable in this environment.

Although blood cultures did not yield any growth in those in which it was done, bacteraemia has been recorded in 10-25% of patients with pyomyositis,<sup>2,7,8</sup> and it is necessary especially in very ill patients and those with pyrexia.

The results following incision and drainage combined with antibiotic therapy was quite favourable, with low mortality (1.85%) despite the late presentation of patients with full-blown pyomyositis in this series, and compares favourably with mortality rates from other studies of between 1.5-10%.<sup>2,6,8 - 10,18</sup> We attribute this to prompt diagnosis, appropriate supportive therapy, effective antibiotic therapy and early drainage of abscesses.

Complications recorded in this study were related to the resulting wounds that followed the drainage of abscesses with recurrences occurring due to premature closure of abscess cavities, and this is easily prevented by proper wound dressing techniques. A protracted period of hospital stay is seen in patients with large and multiple abscesses. Metastatic abscesses, myocarditis, hypotension, uraemia, confusion and coma are some of the extra muscular complications that have been reported in pyomyositis.<sup>2, 7, 10, 18</sup>

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