<table>
<thead>
<tr>
<th>Serial No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author 1</td>
</tr>
<tr>
<td>Author 2</td>
</tr>
<tr>
<td>Author 3</td>
</tr>
<tr>
<td>Title</td>
</tr>
<tr>
<td>Keywords</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Category</td>
</tr>
<tr>
<td>Publisher</td>
</tr>
<tr>
<td>Publication Date</td>
</tr>
<tr>
<td>Signature</td>
</tr>
</tbody>
</table>
Causes of gas gangrene seen at the University of Nigeria Teaching Hospital, Enugu, Nigeria

Okechukwu Emmanuel Nwankwo
Department of Surgery, University of Nigeria Teaching Hospital, Enugu, Nigeria

SUMMARY Gas gangrene (Clostridial myositis) is rarely seen and this rarity, coupled with its dramatic presentation and often devastating outcomes, makes such cases of gas gangrene a spectacular and memorable experience. This study analyzes the cases managed over the eleven years and outcome. Gunshot wounds, complicated by late presentation with accompanying frank septicaemia, were seen as the cause in 5 cases of gas gangrene seen at the University of Nigeria Teaching Hospital, Enugu during the five year study period from July 2000 to June 2004.

Introduction
Gas gangrene is a necrotizing, gas-forming process of muscle, associated with systemic signs of sepsis. It is usually seen as a result of wounds sustained in the battlefield and stone seen in civilian settings are rare.1,2 Estimates of the annual occurrence in the whole of the USA range from 1000 to 10,000.3 In the UK only one case of gas gangrene is said to be seen in a general hospital every two years.4 To the best of my knowledge, there have been no published estimates of the incidence of gas gangrene in Enugu.

Patients and methods
This is a prospective study of consecutive patients who had been admitted to an orthopaedic unit at the University of Nigeria Teaching Hospital, Enugu, with suspected gas gangrene as a result of limb wounds over a five year period from July 2000 to June 2004. The initial diagnosis was based on wounds with associated protrusion and tachymetria, tourniquet swelling of the involved limb, pain to distal beds on the surface and normally, or any other foul-smelling discharge, emanating from the wound. The presence of gas gangrene strengthened the initial suspicion.

Each patient on presentation was evaluated and was data collected which included the injury, the history of the wound, the cause, the time of the incident, previous treatment, the type of treatment received and any other associated complaints. A clinical examination was done with particular attention being paid to the type and extent of the wound, the part of the limb affected and its status, especially the degree of swelling and tenderness, its colour, the fluid discharge and the presence of gas gangrene. Gangrene was also investigated and the gestural steps of the patient was assessed. Investigations included X-rays of the involved region, a full blood count, and urine and/or sputum microscopy. X-rays of patients with gas gangrene were done to look for gas in the soft tissues affecting and the presence of gas gangrene was confirmed.

Treatment included wound care, antibiotic and radical surgical debridement. A diagnosis of gas gangrene was based on the clinical features, the presence of gas-positive anaerobic cultures, and/or necrotising and exudative lesions seen on histological examination of the wound tissue. The treatment was usually successful.

Results
During the four-year period of the study, a total of 416 patients were admitted to this unit; 302 had open wounds and 114 were found to have gas gangrene, which were suspected to be confirmed by gas gangrene were confirmed in the study, but only 14 cases met the criteria for the diagnosis.

All the cases were seen as a result of gunshot wounds to the limbs. Five of the 14 cases were from the police firearms, seven were from special service wounds and the remaining two were from accidental discharges during hunts.
The sheets from the police and the expected findings, from the nature of injury and the position of the bullet, were suspected to be from high velocity fragmentation at close range. The lower limb was involved in 12 cases and the upper limb in 4 cases. The lower limb, the digits were affected in 8 of the cases and 4 of the cases, respectively. Only the leg was involved in the upper body. Thugs were 12 cases and two women, giving a ratio ischemia of 6:1. The age group was 20-40 years with a mean of 34 (Figure 1). Injuries sustained were: case type A3, open fracture; case type B2; case type TC; two femoral artery injuries and one healed arm injury, respectively. No. of the patients presented before 24 h. Two patients presented about 24 h after the injury, two presented after 48 h, two cases on the second day, two presented on the fourth day, one on the sixth day, and one on the seventh day. Two cases presented within 48 h had not received any treatment at all. The five that came on days 3 and 4 had not received any treatment without any medical supervision. The wounds of the remaining two had been complicated by medical institutes or hospitals. In all the cases, there was a deep entry wound in an expanse of varying size and shape size, with scaled bone and tendons surrounding the elbow. In one of the cases, the radial bone was present, and in some cases, they were bony joint. The two patients who presented on the sixth and seventh days had gangrene of the involved lower limbs. In these cases, there was gangrene. In all the cases, there was a fluid-displacing fluid discharge of varying consistency and color, depending on the degree of suppuration and the size of the wound.

Laboratory findings

In all the cases, the microscopy showed Gram-positive rods with a tendency of polymorphonuclear cells. The culture and sensitivity tests showed that 6 of 10 cases were positive for Gram-positive rods and 8 of 10 cases were negative for Gram-negative organisms with no pattern. The two cases with positive flora had not received immediate medical attention. All the patients had a hemoglobin level of below 90 g/100L.

Surgical treatment

Radical care of debridement was done in all cases. Except in one case involving the upper arm where local salvage was possible, all the cases suffered amputation. The excision was one of the cases that presented within 24 h of the injury. In all the cases, the wounds were left open. Secondary closure was done later.

Outcome

Two patients survived, two died, giving a mortality rate of 80%.

The two who died had presented on the sixth and seventh days after receiving treatment from a local medical institution which had resulted in gangrene and required major fixation. Of the survivors, one was discharged, and the other had to undergo limb amputation.

Discussion

A suspicion of clostridial infections should be aroused when the case and circumstances of the wound meet such that they reflect the transmission, presentation, and growth of clostridial organisms whose spores are almost ubiquitous. This was the case of all the wounds entered into this study. They were severe wounds with gross tissue damage, and none had received any wound care for up to 24 h after injury. This was what led to the suspicion of gas gangrene and other clostridial infections. The clinical features and investigations gave further information on the type of clostridial infection. Only those that indicated gas gangrene were classified further.

The diagnosis of gas gangrene is based on clinical features, the supporting microbiological data, and the typification of the pathogenetic organoleptic symptoms of gas gangrene. This was the case in 24 cases. However, it is possible to do an etiological culture in order to determine the species of clostridium directly implicated in gas gangrene must not be underestimated. However, it is not enough to investigate the diagnosis, as the confirmation of gas gangrene is said to be established on the finding of odors and a foul purging breath smell of the muscle during surgery.

Three features were observed in each of the 14 cases. All the cases occurred as a result of complications caused by gunshot wounds from high velocity firearms or fina bullet or a close range, which are known to cause extensive tissue damage and contamination with foreign and endogenous material. None of the wounds received appropriate care for periods varying from two to seven days. The combination of severe tissue damage caused by gunshot and fluid anaerobic infection following delayed wound care caused by late presentation caused a widespread infection of low tissue oxygen tensions and other metabolic requirements for progression and growth of Clostridium welchii and other species of gas gangrene.

Fourteen cases were four years approximately to three to four years. The general mortality for gas gangrene is in the region of 20%. Survival is related to many factors such as age, sex, location in the body, etc. Those who survive are the younger patients, those in whom only the extremities are involved, wounds with an inoculation period <30 h, patients with an abscess and a localized infection.

A mortality of 10% was recorded in this study. This low mortality must be due to the fact that only the extremities were involved and most of our patients were young (see Figure 1).

Tropical Tropisr. April 2008, 38
An overnight sedimentation method: Improving the diagnosis of tuberculosis when electrical centrifuge is not available

M U Rasheed MiSM, Tsegaye Derehu
School of Medical Laboratory Technology, Jimma University, PO Box 378, Jimma, Oromiya, Ethiopia

Correspondence for M U Rasheed, School of Medical Laboratory Technology, Jimma University, PO Box 378, Jimma, Oromiya, Ethiopia

E-mail: murasheed@jimma.edu.et

TROPICAL DOCTOR 2014; 38: 76-79
doi:10.5001/td.2014.33

SUMMARY: An experimental comparative study was conducted in order to compare the practicality and usefulness of sedimentation and microscopic examination using a direct sputum smear with the microscopic examination of centrifuged sputum samples with and without sodium citrate. Two different types of centrifuges were used: a clinical centrifuge and a portable centrifuge. The study was conducted on 110 sputum samples. The results showed that the portable centrifuge is more practical and useful for the examination of sputum samples.

Introduction

The diagnosis of tuberculosis is a difficult and complex task. The sputum smear examination using a direct sputum stain and microscopic examination (DST) is a widely used method for the diagnosis of tuberculosis. However, this method has several limitations, including the need for fresh sputum samples, the need for skilled technicians, and the limited sensitivity of the method. Therefore, the development of new and more efficient diagnostic methods is crucial for improving the diagnosis of tuberculosis.

Materials and methods

Sample collection

An experimental comparative study was conducted for the microscopic examination of sputum by centrifugation. The samples were collected from patients with suspected pulmonary tuberculosis at the Jimma Regional Referral Hospital, Jimma, Ethiopia, during the study period March to June 2014. A total of 110 sputum samples were collected and analyzed. The standard sample collection procedure was followed strictly. This study was based on sedimentation testing of sputum samples.

Laboratory procedures

Direct smears were prepared, air dried, heat fixed and stained by the ZN method. One milliliter of sputum from the same sample was added to a sterile 10 ml screw-capped conical tube, mixed with 1 ml of 5% sodium hypochlorite, and incubated at room temperature for 10 minutes which were decontaminated with sodium hypochlorite. The supernatant was discarded and one tube was centrifuged for 15 minutes at moderate speed (8000 rpm). Another tube was left overnight at room temperature. The supernatant was discarded and the pellet was resuspended in a few drops of distilled water. Sections were prepared from the wash- suspended sputum for each method and then dried, fixed and stained with ZN stain.

References

1. Rasheed MU. Clinical and other chemotherapeutic and ant}
   i-microbial 
   137-139.


   1925;287:1179.


5. Al-Saadi F, Al-Rashid B. Microbiological studies on sputum.


7. Mieboldt G. Clinical and other chemotherapeutic and ant-
   i-microbial 
   137-139.