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Fulminant gas gangrene in an adolescent: A case report pointing out importance of early diagnosis in survival of the patient

Dr. Anu Sharma[1], Dr. Sonal Agarwal[2], Dr. KV Ingole[3]
[1] Assistant Professor, Department of Microbiology, Dr. V.M. Govt. Medical College, Solapur, Maharashtra, India
[2] Post Graduate Student, Department of Microbiology, Dr. V.M. Govt. Medical College, Solapur, Maharashtra, India
[3] Professor & Head, Department of Microbiology, Dr. V.M. Govt. Medical College, Solapur, Maharashtra, India

Abstract
Gas gangrene or Clostridial myonecrosis is necrotic infection of skin and soft tissue caused by Cl. Perfringens. Tissue necrosis is due to exotoxins produced by these organisms. Classical finding in the patient with gas gangrene is gas under the skin (crepitus), change in colour of area with foul smelling discharge. On microscopy gram positive bacilli without spores are seen with no pus cells showing absence of inflammation. Rapid diagnosis of the infection may help in favorable patient outcome and prevent life threatening complications.

Keywords: myonecrosis, crepitus, Cl.perfringens

Introduction
Gas gangrene means cell necrosis which may be caused by various microorganisms like *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Clostridium perfringens*, *Clostridium septicum* and other anaerobic bacteria may be responsible for gas gangrene [1]. Most cases of gas gangrene may be attributed to trauma, recent surgery, diabetes and peripheral vascular disease [2]. In Clostridial myonecrosis, evolution of gas results in early gangrenous changes. These gases are distributed in tissue planes and generate palpable emphysema. Necrotic process extends to adjacent healthy tissue, causing massive necrotizing gangrene within hours.
Rapid proliferation and systemic toxicity is due to four exotoxins produced by Clostridium spp. responsible for intravascular hemolysis, tissue necrosis [3]. This case report points out on importance of early diagnosis with help of provisional & confirmatory Microbiology reports which help in better patient outcome.

Case Report
This is a case report of 13 year old boy with history of trauma (fall from bike during road accident) in left limb. Patient was admitted to the hospital with history of trauma to left limb 2 day back, since last 18 hours patient had fever, severe pain in whole left limb, with change in colour and edema at the site with limited mobility and gait.
On examination respiratory rate was 24 breaths/min, heart rate was 120 beats/minute, body temperature was 39ºC and blood pressure was 130/80 mm Hg. Orthopedic reference was taken to rule out fracture, since the pain and edema was progressively increasing, and changes in skin colour along with crepitus was seen. Gas gangrene was suspected.
Samples like deep tissue and blood were collected for microbiological evaluation, deep tissue was collected in Robertson Cooked meat medium (RCM) and 3 smears were made bedside. After Gram staining there was evidence of thick stubby boxcar shape gram positive bacilli without spore and no pus cells were seen, provisional report was given positive for gas gangrene. One swab was inoculated on blood agar and incubated anaerobically at 37º C for 2 days by gas pak. Growth was observed after 48 hours. Blood sample was declared sterile after incubation for 14 days. Identification of *C. perfringens* was done by observing target hemolysis on culture media, smear from Robertson cooked meat broth and blood agar showed thick stubby boxcar gram positive bacilli without spores. Confirmation of *C. perfringens* was done by target hemolysis, reverse CAMP test and Nagler's test [4].
After provisional report surgical debridement was done and IV antibiotics like Vancomycin, Metronidazole and Meropenem were started. Patient recovered and discharged after 10 days. On follow up OPD visit patient was healthy with complete healing of wound.

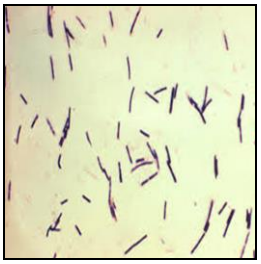

Fig 1: Gram positive bacilli without spores

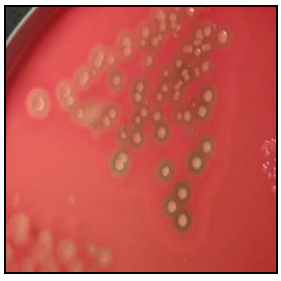

Fig 2: Target hemolysis by Cl. perfringenes

Fig 3: Nagler's reaction shown by Cl. perfringens

Discussion

The diagnosis of gas gangrene is based on clinical findings, demonstration of myonecrosis and supporting Microbiological data. Bacteremia is documented in 10 to 15% of patients with Clostridial myonecrosis. However in our case patient's blood culture was found to be sterile in both aerobic and anaerobic blood culture incubated for 14 days.

Treatment includes early surgical debridement with antibiotic therapy and hyperbaric oxygen. However hyperbaric oxygen is less useful in cases of Cl. perfringens & Cl. septicum as they are aero-tolerant.

The current case report points out importance of Microbiology reports in early diagnosis of gas gangrene which helps in timely treatment of patient which leads to decrease in mortality and morbidity among patients. As delay in diagnosis may result in to life threatening complications.

Conclusion

Gas gangrene is considered to be fulminant disease so early diagnosis helps in timely initiation of antibiotic therapy and surgery must not be delayed once the diagnosis is suspected. It is recommended these patients should be handled in intensive care unit due to life threatening complications.

References

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