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A Case of Clostridium Perfringens Infection Complicated by Transformation of Myelodysplastic Syndrome in Basra

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Abstract

Purpose: Purpose of research is Mesenchymal tissue infections due to Microorganisms Clostridium perfringens had been defined with inside for loads of years. Bacteria Clostridium gas gangrenous stays an crucial reason of incidence and mortality with inside the world.

Methodology: The methodology is summarized as follows of take a look at became to document a case of a affected person recognized of myelodysplastic syndrome , submitted to uterine curettage and developing with spontaneous gas gangrenous 8 hours after surgical operation . Female affected person, Twenty eight years old, with a registry of ache within side the distal 3rd of the decrease legs, radiating to the popliteal fossa, with worsening on palpation and motion of the legs, attached via way of means of an boom in temperature and quantity place (1). She Suffering pyrexia, hyperemia or nearby trauma, evolving to septic shock. Angiotomography of the extremities and pelvis found out a presence of gas permeating in muscular bundles of thigh and leg.

Findings: The mixture of records and medical analysis, radiological take alook at showedthe syndromes' prognosis of spontaneous gas gangrenous. Despite excessive fee of suspected enhance scientific outcomes, such infections development so speedy that loss of life might also additionally precede prognosis, however, early popularity and competitive treatment, along with open or percutaneous drainage.

Unique Contribution to Theory, Practice and Policy: Parenteral antibiotics in opposition to Clostridia need to be right away initiated, in addition to scientific assist measures.

Keywords: *MDS, Curettage, Gangrenous Gaseous, Clostridium, Sepsis, Human, Feminine, Adult, Medical Examination of Cases*

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INTRODUCTION

Soft tissue infections resulting from Clostridium species were defined with in side the literature for loads of years in in large part because of its fulminant nature, medical displays and the issue handling (1). The species Clostridium perfringens, septicemia with histolyticum are a primary reasons gas gangrenous related to trauma and its occurrence dramatically will increase in instances of war and incidents (3) as of late, there have been additionally an elevated occurrence of unconstrained gas gangrenous GG resulting from microscopic organisms C. perfringensin affiliation with gastro digestive abnormalities and neutropenia. The pathogenesis of gas gangrenous (6) includes the improvement of contiguous take shape of a trauma vicinity or hematogenous path of different foci, with muscle seeding (2), early Diagnostics and medication are essential. The intention of this examine turned into to record a case of a patient with prognosis of myelodysplastic syndrome submitted to curettage uterus, evolving with GG on the second one day of hospitalization in lower area at legs, 7-8 hours after the surgical procedure (8).

Medical Examination of Cases

Female patient, Twenty eight years old, with a records of myelodysplastic ailment and more than RBCs transfusions for remedy of symptomatic anemia and thrombocytopenia. denied use ordinary of drugs. Admitted to the health facility emergency room Al-Sadr Teaching Hospital with a circumstance that began out five days before, characterized through heavy vaginal bleeding, no clots, refractory to the usage of estrogen and antifibrinolytic tranexamic acid for six days. On admission, ultrasound turned into performed. trans vaginal technique that allowed the topography of the endometrium as a focal point of bleeding, and admission for healing uterine curettage. During the surgical manner, there has been no presence of discharge or symptoms and symptoms of infection (6-7).

on the second one day of hospitalization, 7-8 hours after the manner surgery developed with ache with in side the distal 1/3 of least legs LL, in wounding, of sturdy intensity, radiating to popliteal fossa region, with worsening on palpation and motion legs, followed through an growth in temperature and extent place. She Suffering pyrexia, hyperemia or nearby trauma with pain respiration. On bodily examination, she became in a normal fashionable condition, pale+3/+4, hydrated and a cyanotic.

Clinical Examination

Respiration rate = 15 ipm, cardio rate = a hundred and twenty bpm, blood pressure = one hundred thirty x ninety mmHg, temperature = 37.3º C, SpO_2 = 95% in room air.The cardiac auscultation, ordinary coronary heart rhythm in 2 beats, with murmur slight protomesystolic +2/+6 during mesocardium with out irradiation. Pulmonary auscultation and assessment of the stomach with out changes to the medical examination. Extremities with edema with in side the distal 1/3 of LL 1+/4+, with purulence present, observed via way of means of primary nearby hyperemia in bilateral tibial plateau and boom in temperature diffuse location. Peripheral perfusion < threeseconds. peripheral pulses bilateral, symmetrical, rhythmic, with exact amplitude. Signals Bilateral positive Bancroft, Bilateral positive Homans, Lisker left positive, Pratt uncertain with maintenance solely pain in leg bone plateau, Rose positive bilateral. Ventured the diagnostic hypothesis of deep vein thrombosis. began to administration of enoxaparin 60 mg each twelve hours and requested Doppler ultrasound of the lower legs.

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On ultrasound examination, the common leg bone, femoral and hinge joint are conferred in shape, contours, topography and squeezability preserved. Fibular and tibias vein santerior and posterior of adverse characterization because of blended hyper chogenic foci that promote acoustic shadowing later. SuGGsting a gaseous essence. ACT angiography examination was then performed. Tomography of the pelvis and extremities showing the presence of gas permeating the muscle facies of the thigh and leg bilaterally.

After the initial tomographic examination, infection was suspected. Caused by a gas-forming bacterium and initial measures for sepsis with intravenous fluid administration with 0.9% saline solution 20 ml/kg for the first 30-60 minutes.

Antibiotic therapy started with meropenem 1 g every 8 hours and vancomycin 1 g every 12 hours. Blood tests were requested and the establishment of a central venous access indicated. Within two hours she developed subcutaneous emphysema. In the lower extremities and reduced peripheral blood flow in the distal third of the lower extremities, characterized by non-palpable pulses, reduced local temperature, and intense pallor, accompanied by an increase in pain unresponsive to opioid treatment. local compartment syndrome was diagnosed and the vascular surgery team was asked to perform a fasciotomy. There was a progressive decrease in level of consciousness accompanied by hypotension BP = 72 x 46 mmHg contradicting the venous volume study, and or tracheal intubation was indicated to protect the airway and assist ventilation, and norepinephrine was administered at 0.36 µg /kg for minute. Ten hours after the onset of symptoms, the patient presented an extracorporeal circuit with pulseless electrical activity and was unresponsive to cardiopulmonary resuscitation maneuvers.

Laboratorial Examination

It was found when in Gram-positive blood culture Clostridium perfringens. after incubating, gram positive bacteria were insulated in two anaerobic flasks from triplet of blood cultures. These rods were determine as Clostridium perfringens using the Vitek2 ANC card. Clostridium isolate was suspend in soy broth with a McFarland standar of 1.5 for susceptibility testing. , a C. perfringens has been found to make sensitive to clindamycin, penicillin, imipenem and metronidazole.Cefepime 1 g IV each 6 hours was then replaced with ampicillin sulbactam 1 g IV each 12 hours and clindamycin 1g IV each 6 hours. The combination of ampicillin sulbactam and clindamycin was used because the patient was immune compromised than had severe pancytopenia.

A blood culture perform after ten days and noone microbial colony is observe. Even so, the Pyrexia returned and after seven days the patient plaintiffed of pain in the right lower leg near the former peripheral. Physical observation revealed erythema and swelling with purulent release in the right pretibial region. CRP increased from 16 mg/dl to 28 mg/dl. Wound secretion cultures yielded methicillin resistant S.aureus. For this reason the patient was treated with teicoplanin 150 mg IV every overnight, clindamycin 1g IV every 6 hours, and meropenem 1 g IV every 12 hours.

Discussion

Gas gangrenous can be easily diagnosed based on clinical results and technology, GG is deadlier, and gynecologic contaminations caused by Clostridium Lead to deathly usually precedes diagnosis (1,3). Given this perspective, the patient presented as a rapidly progressive and fatal complication of GG caused by Clostridium (3,4-7).

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Clinical signs requiring diagnosis include pain, rapidly progressive soft tissue infection, tissue gas, and a positive blood culture.It should be noted that with sufficient blood volume collection, most bacteraemic >90% can be detected within 24-36 hours after incubation. Quality assurance and the prevention of blood culture contamination should be given special importance when critically ill patients are admitted, especially in emergency departments (8).

Sometimes a venous congestion network that is drawn into the skin and extends away from the affected area can occur. Swollen blisters of various sizes, filled with clear, hemorrhagic or purple fluid, can form on the surface of the skin. Around the affected person, the skin may turn a purplish color, reflecting vascular impairment resulting from the diffusion of bacterial toxins into surrounding tissues (5). The clinical pathophysiology of the syndrome presented by this patient, is fairly clear and involves two-degree severe pain and evidence of gas permeation. into the relevant tissue. Two toxins, alpha-toxin also called Clostridium perfringens -phosphor-lipase {Cp_PLC} (6).

The molecular compound {Cp_PLC} Alpha-toxin is a $Zn2^{+}$ metallic enzyme with lecithinase and sphingo myelinase has two ends, one amino and the other carboxyl. The amino end increases the permeability of blood vessels by increasing the internal pressure and expanding the lining endothelium, which results in increased platelet aggregation and hemolysis or may lose its physiological properties. This raises the levels of cytokines in the blood, especially TNF, which leads to bradycardia in a critical manner that may result in the death of the patient. As for the carboxyl end, it is responsible for the toxic factor of Cp_PLC, as it works to rupture the tissue lining of the blood vessels and increases the rate of staisis and the toxic effect spreads to the muscles that are directly connected to those blood vessels, which leads to damage to muscle tissue and the damage spreads to other neighboring tissues, events, setting the stage for anaerobic growth (7).

Mortality in GG proximity from 67% to 100%, with most deaths occurring over night of onset and associated with shock and organ failure. However, cases of GG with fulminant sepsis have been described in the literature, suGGsting that Clostridium perfringens is the most important etiological factor (1,2).

GG increased incidence of disease from Clostridium perfringens and necrotizing enter colitis, thylitis, or distal ileitis commonly occurs in these cases. These gastrointestinal disorders allow bacteria to move through the bloodstream, leading to muscle wasting, and air-tolerant Clostridium perfringenscan multiply, leading to muscle necrosis .However, in this case the myelodysplastic syndrome was presented as a predisposing factor for immunosuppressive diseases (4).

The gold standard remains the triumvirate of early diagnosis, operative removal of all necrotizing tissue, and therapy with antibiotics. In particular, urgent complete surgical debridement is imperative to improve survival, preserve legs and prevent complications (3). patient procedures had hypotension and increase the level keratinize, low serum bicarbonate, increase the level creating phosphokinase 2-3 times upper limit of normal, marked left-shifted neutrophil, or CRP > 13 mg/L Patients require immediate hospitalization, and definitive etiologic diagnosis should be made through procedures such as Gram and needle aspiration cultures or biopsy specimens, as well as surgical evaluation to examine, explore, and drain the affected site (9).

Antibiotic therapy for GG : due to Clostridium septicemia should include penicillin three to four million units intravenously IV every four hours and clindamycin 900 or 600 mg IV every

eight hours or tetracycline A combination of 500 mg intravenously every 4 hours for six hours exists IV. This approach was derived from the treatment of traumatic gas gangrenous caused by Microorganisms Clostridium perfringens and is based on animal models. However, other antibiotics such as, chloramphenicol, piperacillin, metronidazole, carbapenems, and combinations of β-lactams with β-lactamases inhibitors. Ampicillin-sulbactam was effective against the majority of Clostridia, and this has not significantly changed over the past decade, although clindamycin resistance has been documented by some strains of C. perfringens.

The choice of the antibiotic penicillin is due to it being a broad-spectrum antibiotic and having a significant effect on anaerobic bacterial rods by destroying their cell wall, which is made up of peptidoglycan.

Sometimes we resort of clindamycin is similar in mechanism to penicillin, but it has a more effective effect in certain disease conditions than penicillin, such as septicemia, respiratory infections, and skin infections, especially those resulting from anaerobic rods.

antibiotic tetracycline affects the nuclear material of bacterial rods, especially S30 ribosomes, as it prevents the accumulation of amino acids required for building the cell, which weakens its growth and ends with the bacteriacidalation.

Implications of the study

Myelodysplastic Syndrome is of great importance in understanding the disease that has begun to increase in the corridors of the emergency department in hospitals, which may lead to serious complications that may lead to death due to the inability to diagnose bacterial rods early with certainty in the laboratory except after a considerable time has passed, at which point it is too late to save the patient's life. In a research topic, I dealt with the case of a patient who was admitted to the emergency department of a hospital in Basra, and we suspected the presence of a clinical case of MDS, which helped us form a confirmed idea about the necessity of early and intensive clinical and laboratory diagnosis to prevent the loss of the patient and save the lives of many.

REFERENCES

1. Stevens DL, Aldape MJ, Bryant AE. Life-threatening clostridial infections. Anaerobe. 2012;182:254-9.
2. Bryant AE, Stevens DL. Clostridial myonecrosis: new insights in pathogenesis and management. Curr Infect Dis Rep. 2010;125:383-91.
3. Wright WF. Clostridium septicum myonecrosis presenting as an acute painful foot. Am J Emerg Med. 2012;301:253.e3-5.
4. Johnson S, Driks MR, Tweten RK, Ballard J, Stevens DL, Anderson DJ, et al. Clinical courses of seven survivors of Clostridium septicum infection and their immunologic responses to alpha toxin. Clin Infect Dis. 1994;194:761-4.
5. Stevens DL, Musher DM, Watson DA, Eddy H, Hamill RJ, Rosen H, et al. Spontaneous, nontraumatic gangrenous due to Clostridium septicum. Rev Infect Dis. 1990;122:286-96.
6. Flores-Díaz M, Alape-Girón A. Role of Microorganisms Clostridium perfringens phospholipase C in the pathogenesis of gas gangrenous. Toxicon. 2003;428:979-86.
7. Nadisauskiene RJ, Kliucinskas M, Vitkauskiene A, Minkauskiene M, Vaitkiene D. Puerperal Microorganisms Clostridium perfringens sepsis in a patient with granulocytopenia. Gynecol Obstet Invest. 2008;651:32-4.
8. Riedel S, Carroll KC. Blood cultures: key elements for best practices and future directions. J Infect Chemother. 2010;165:301-16.
9. Stevens DL, Bisno AL, Chambers HF, Everett ED, Dellinger P, Goldstein EJ, Gorbach SL, Hirschmann JV, Kaplan EL, Montoya JG, Wade JC; Infectious Diseases Society of America. Practice guidelines for the diagnosis and management of skin and soft-tissue infections. Clin Infect Dis. 2005,4110:1373-406. Erratum in: Clin Infect Dis. 2005;4112:1830. Clin Infect Dis. 2006;428:1219. Dosage error in article text.