

Extensive Necrotizing Fasciitis (NF) following Administration of Intra-Muscular Injection in a Acute febrile illness with Thrombocytopenia due to Dengue fever.

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ABSTRACT

We report the case of 22 years of young male patient, non-addict, without any long standing disease like diabetes, hypertension or peripheral vascular disease, presented with fever with chills for three days and taken Intra-muscular injection at Right buttock for fever and developed extensive necrotizing fasciitis (NF) with crepitus (sub-cutaneous emphysema) in Right legs, thigh, rt. Lateral abdominal wall and back. He was diagnosed to have acute febrile illness with thrombocytopenia due to acute dengue infection. He also developed septicemia, rhabdomyolysis and subsequently acute renal shutdown within short time. Extensive surgical debridement, antimicrobial therapy and sustain low efficiency dialysis (SLED) given. Despite rapid diagnosis and treatment, the patient died of septic shock with multiorgan failure.

Keywords: Necrotizing Fasciitis, Thrombocytopenia, septicemia

Abbreviations: NF - Necrotizing Fasciitis, SLED - Sustain Low Efficiency Dialysis

Introduction

Necrotizing fasciitis or NF, commonly known as flesh-eating disease, flesh-eating bacteria or flesh-eating bacteria syndrome [1]. Wilson used the term *necrotizing fasciitis* without assigning a specific pathologic bacterium that caused the disease [2]. It is an uncommon, devastating soft tissue infection primarily involving superficial fascia, subcutaneous fat and deep fascia that relatively spares skin and underlying muscle. NF a term introduced by Wilson, was first described as “hospital gangrene” in the American Civil War era [3]. It most frequently occurs in the abdominal wall, extremities and perineum, where the pathogen may be introduced in the subcutaneous space via disruptions of overlying skin. Besides direct inoculation, haematogenous spread from a distant site may probably occur. The disease predominantly develops in diabetics, alcoholics, immunosuppressed patients, illicit drug users and

patients with peripheral atherosclerotic vascular disease. Despite rapid diagnosis and treatment, case fatality rate is high and any delay may correlate with worse outcome [1]. The morbidity and mortality of necrotizing fasciitis is 20%-60% [4]. Lethal outcomes in patients with NF who undergo therapy with NSAIDs are reported [5]. NSAIDs enhance the production of TNF- α in the presence of endotoxins by impairing the normal feedback loop during the production of TNF and other cytokines, and, therefore, acting as an additional stimulus to the proinflammatory cascade. In addition, they are potent inhibitors of neutrophil granulocyte chemotaxis and phagocytosis by inhibiting the lipoxygenase pathway, which is specially true for diclofenac and indomethacin. In the same way, they also decrease leukotriene production by leukocytes, which are compounds known to play a role in the inflammatory response. Finally, they confound the progression of disease by suppressing fever and pain through inhibition of prostaglandin synthesis, thus blurring the signs of onset of serious infection.

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Case Report

A 22 years of male patient presented with history of fever with chills since 3 days, right leg swelling and unbearable pain since 2 days and drowsiness since 1 day. Patient was apparently alright 3 days ago when he developed fever with chills. For which he went to his family doctor who

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gave some tablets and Intra-muscular injection in right buttock. Next day, fever continued but in addition he developed pain in right buttock (at the site of injection) and swelling, which increased rapidly and involved right lower limb along with unbearable pain. There was no relief, for which he went back to same family doctor who gave another intramuscular injection in right deltoid. Day third, patient develops swelling and tightness of entire right lower limb massively. He got admitted to a nursing home with drowsiness from where he was transferred to our hospital for further management. In casualty, he was in shock with poor general condition. BP was not recordable, pulse was 146/min, tachypnoea, SPO2 90%, RBS 95mg/dl with icterus. After giving IV fluid of 2 litres, patient was transferred to ICU. In ICU, fluid challenge was given followed by 250ml/hr NS started and patient was stabilized with inotropic (nor-adrenaline) support. He was given meropenem and clindamycin intravenous as broad spectrum antibiotics. His pulse rate came down to 116/min, Blood pressure rose to 110/70. hemodynamic monitoring started. There was hemorrhagic as well as echymotic patches at the site of injection as well as on right thigh (as shown in picture). Right thigh and leg was extreme painful. There was extensive crepitus over right lateral wall of abdomen, right thigh and leg along with sole. Necrotizing fasciitis was diagnosed. Patient passed only 10 ml of hemorrhagic urine since admission. Surgical reference was made for urgent surgery with high risk consent. Patient was given 1 packed cells, 4 FFP and 6 units of random donor platelets transfusion given prior to surgery. Within 2 hours after hemodynamic stabilization, surgery was performed. Multiple incisions were made through out right lower limb. There was extensive necrotizing materials, pus and lots of gases evacuated. Muscle biopsy and necrotic materials send for histopathological investigation. Smear from pus revealed no Gram positive spore bearing organisms (Gas gangrene). Pus Culture did not grow any organism.

Results

On admission : Haemoglobin - 9.7 PCV-24.4,WBC-18800,Platelets-58000, IGM LEPTOSPIRA- 2.4 NEGATIVE(N=<9 UNIT),DENGUE IgM positive, NS1 antigen and IgG dengue negative, HbsAg non reactive, HIV non reactive, anti HCV- non reactive, SGPT-95, Alkaline phosphate-37, Total Protein 10.6 (hemoconcentrated), Albumin 5.9, Globulin 4.7,SGOT 1060,GGTP 800, INR-2.81, PT-28.3s, INR 2.81, aPTT-50.5s (N : 23-33), CPK-12965 (normal: 55-175 IU/L), BT 3'55", CT 9'58" , CLOT RETRACTION 56% (N: 48-64%), FDP 18.2mg/l (N:0.05-0.3 mg/l), PLASMA FIBRINOGEN 293 (N 250-450 mg/dl), ABG : PH 6.9, PCO2 22, HCO3 6.5 SEVERE METABOLIC ACIDOSIS, Urine routine examination :

Protein 4+, epithelial cells 2-3, Leucocytes-6-7, Erythrocytes >200/hpf, Bacteria Present Few granular cast present. Post operation : Haemoglobin-2.4,PCV -6.5, WBC-11900, Platelet-52000,

USG Lower Limb- Extensive diffuse subcutaneous oedema extending into intramuscular planes with air bubbles noted in all aspect of right thigh & lower limb. Fascial layer thickening is noted. Above finding suggestive of necrotizing fasciitis. **X-RAY Chest Supine AP** - No significant abnormality seen except there is pneumomediastinum seen outlining heart and aorta. Air also seen in neck and outlining diaphragm. **Tissue Specimen-**Histopath of tissue biopsy revealed haemorrhagic and necrotic muscle tissue with infiltration of neutrophils seen suggestive of necrotic muscle.

Post-operatively, patient was transfer to ICU and Sustained low efficiency dialysis (SLED) started in view of anuria along with packed cell transfusion. Patient was on ventilator with Inotrope support. Patient developed sudden onset bradyarrhythmia and arrested. However patient could not be revived and patient died within 24 hours of admission.



Figure 1 : Necrotizing fasciitis due to IM injection in a 22-years of male patient. Note Site of injection (Right buttock) minimal erythema, swelling and echymotic patches



Figure 2:Necrotizing fasciitis due to IM injection in a 22–years of male patient. Note minimal erythema , swelling and echymotic patches over right thigh and involving upper part of lower leg.



Figure 3 : Necrotizing fasciitis due to IM injection in a 22-years of male patient. Note minimal erythema, swelling and echymotic patches over right thigh and involving upper part of lower leg.

Discussion

This patient was presented with Acute febrile illness with thrombocytopenia due to dengue fever. Patient received Intra-muscular injection for fever. Patient deteriorated rapidly and developed necrotizing fasciitis involving lower limb with crepitus formation all over right limb and retroperitoneal spread of air into mediastinum. Patient also developed rhabdomyolysis (as evidence by CPK- 12965 (normal: 55-175 IU/L) leading to Acute Renal shutdown. Despite early diagnosis and immediate intervention, our patient could not be survived. It most frequently occurs in the abdominal wall, extremities and perineum, where the pathogen may be introduced in the subcutaneous space via disruptions of overlying skin. Besides direct inoculation (intra-muscular injection) haematogenous spread from a distant site may probably occur. Pain out of proportion to physical findings in a patient with evidence of a systemically toxic condition should raise the clinical suspicion of necrotizing fasciitis. Overt sign of necrotic tissue, such as crepitus occurs only in 30% of the patients. Radiographic imaging like Ultrasonography, CT scan is helpful to diagnose necrotizing fasciitis. Treatment modalities comprise early aggressive surgery with frequent wound debridement, broad spectrum antibiotic coverage, hyperbaric oxygen, and supportive care [6].

Conclusion

Whenever there is epidemic of acute febrile illness with thrombocytopenia, intra-muscular injection is to be avoided. If there is pain at the site of injection, careful observation should be made and if require proper reference should be given. Recent studies [7] have highlighted the importance of correct IM drug administration, in order to minimize the risk of potentially serious complications. Appropriate clinical practice needs to reflect considerations about appropriate needle length and gauge, to ensure that patients get the benefit

of drug administration without adverse effects. Muscle tissue is usually spared the harmful effects of substances injected into it, probably because of its abundant blood supply. However, deep IM injections can cause abscesses and granulomas, whereas more superficial IM injections may result in increased incidence of local reactions, such as irritation, inflammation and necrosis. The clinical presentation may be masked, as changes in the overlying skin may only be observed later in the disease process. Clinical differentiation between necrotizing fasciitis and non-necrotizing fasciitis is more important as NF require immediate treatment. Current guidelines continue to emphasize timely diagnosis, effective surgical debridement and appropriate initial antibiotics coverage as proven way to optimize the patients outcome.

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