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RESEARCH ARTICLE

DISSEMINATED INTRAVASCULAR COAGULATION TRIGGERED BY HEAT STROKE – AN UNUSUAL CASE STUDY

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ABSTRACT

Heat stroke is a common presentation in hot climates and if not treated aggressively can be fatal. It generally has a typical clinical presentation which includes nausea, vomiting, signs of dehydration, disorientation or coma. In this case report, we present an unusual presentation of heat stroke in a young female. She had an unusually high body temperature which was associated with reduced levels of consciousness followed by disseminated intravascular coagulopathy.

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INTRODUCTION

Heat stroke in high temperature environment is a common clinical presentation and if not treated aggressively, can be life threatening. It is typically presents with nausea, vomiting, confusion, disorientation and coma (Sonkar *et al*., 2012). It is characterized by high body temperature (Lim, 2006). However, unusual presentations are also seen. The pathophysiology of heat stroke revolves around the fact that it can result in different reactions within the body which may lead to neurological and coagulation dysfunctions. Initial peripheral vasodilation due to high temperature is compensated by vasoconstriction of splanchnic and renal blood vessels. Neurological symptoms of raised intracranial pressure result from cerebral edema due to hyperthermia (Sonkar, 2012; Bouchama, 2002). Raised temperature also has an impact on coagulation where there is a reduction in Protein C, protein S and antithrombin III. Clinical features of these are similar to the ones seen in disseminated intravascular coagulation (Bouchama, 2002).

African continent has been thought to be one of the most vulnerable regions where heat related illness are rising (4). It is anticipated that there would be a rise between 4 and 6 degrees centigrade in subtropics and between 3 and 5 degrees centigrade in tropics by the end of century in Africa (5).

CASE REPORT

A 39-year-old female was referred from local clinic to the regional hospital in KwaZulu-Natal province of South Africa with history of collapse at work. She was working in a sugar cane field during summer time. At the local clinic, she was found to have a Glasgow Coma Scale of 3 with a blood pressure of 96/65 mmHg. Her temperature was recorded to be 41.0 degree centigrade. She was intubated by the pre-hospital team and was noted to have bleeding from mouth. It took total of five hours to transfer the patient from local clinic to the tertiary hospital. During the pre-hospital phase, patient received total of four liters of Ringer's lactate solution along with one liter of 5% dextrose solution.

Active cooling was also initiated using ice packs. On arrival at the regional hospital, patient had a heart rate of 135 beats per minute, blood pressure of 98/67 mmHg, oxygen saturations of 100% on 100% FiO2 and a temperature of 39.2 degree centigrade. It was noted that bleeding from the mouth continued during her stay in the Emergency Department. She bled approximately one liter during her stay in the Emergency Department. Bruising were also noted in both thighs and axilla with petechial rash. Patient was given 1 gram of tranexamic acid followed by 4 units of fresh frozen plasma. Estrogen and Desmopressin were also given to the patient. The electrocardiogram (ECG) which was performed in the Emergency Department revealed sinus tachycardia (Figure 1). The initial and subsequent venous blood gas (VBG) which were performed in the Emergency Department revealed metabolic acidosis (Figure 2 and Figure 3). Patient was transferred to the Intensive Care Unit but subsequently passed away after few hours. Diagnosis of heat stroke complicated by disseminated intravascular coagulation was made.

DISCUSSION

In heat stroke, central nervous system dysfunction and multi-organ involvement are the most common clinical features (Bouchama, 2002). Heat strokes occurs when heat accumulation overrides heat dissipation (Leon, 2015). Extreme hyperthermia of usually >40.5 degree centigrade is noted in heat stroke (Shapiro, 1990). In recent times, we are seeing a rise in number of patients who suffer from heat stroke. This has been thought to be have been contributed by rising global temperatures and urbanization (Kravchenko, 2013). Inflammatory response which is triggered by heat stroke is similar to the response which is seen in systemic inflammatory response syndrome (SIRS) (Huisse, 2003). Although, it is known that heat stroke can present with disseminated intravascular coagulopathy, however its incidence is still less. If such a patient does present, fatality is likely (10) but patient has survived after careful management (Wakino, 2005; Trujillo, 2009).

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