



Heat stress mimicking Acute Coronary Syndrome and progressing to convulsion in a remote oilfield worker

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Abstract

Heat stress is a serious occupational hazard, especially in hot environments such as oilfields. We report a 47-year-old male oilfield worker in southern Iraq who developed severe retrosternal chest pain and dyspnea, mimicking acute coronary syndrome, which rapidly progressed to a generalised tonic-clonic seizure. He was promptly managed at a remote rig clinic with intramuscular Midazolam, Oxygen, active cooling, and intravenous fluids. The patient stabilised within one hour and remained well after 24 hours of hospital observation. This case emphasises the need to consider heat stress in the differential diagnosis of chest pain in extreme occupational settings and highlights the potential for neurological complications.

Keywords: Heat Stress; Heat Stroke; Convulsion; Occupational Medicine; Oilfield; Case Report

1. Introduction

Heat-related illness encompasses a spectrum from heat exhaustion to life-threatening heat stroke, defined as hyperthermia with central nervous system dysfunction such as seizures or coma [1,2]. Workers in extreme temperatures, particularly in oilfields, are at substantial risk, especially when wearing heavy personal protective equipment (PPE) and lacking adequate hydration [3,4].

Chest pain is an uncommon initial manifestation of heat stress, and seizures may occur unpredictably. This case illustrates an atypical presentation where heat stress mimicked acute coronary syndrome (ACS) and progressed to convulsion in a remote occupational setting.

2. Case presentation

A 47-year-old Chinese male mud engineer was working at midday in the Rumaila oilfield, southern Iraq, under direct sunlight with an ambient temperature of 46°C. He had been working continuously for 2–3 hours on the metallic rig floor and mud system, wearing full PPE. He had only consumed water and no Oral Rehydration Solution.

The patient developed sudden severe retrosternal chest tightness associated with dyspnea, preventing him from standing or speaking in full sentences. After approximately 3–4 minutes, he experienced a generalised tonic-clonic seizure lasting about 3 minutes.

2.1. Investigations

- Blood pressure: 100/60 mmHg
- Pulse: 84 bpm
- Respiratory rate: 16/min

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- Oxygen saturation: 94% on room air
- Temperature: 39°C
- Random capillary blood glucose: 98 mg/dL
- ECG: normal
- Laboratory tests: unavailable

2.2. Differential Diagnosis

- Acute Coronary Syndrome
- Heat exhaustion/heat stroke
- Seizure disorder (Epilepsy, Hypoglycemia-related)
- Electrolyte imbalance

2.3. Treatment

The patient received intramuscular Midazolam 10 mg to terminate the seizure. Supportive measures included high-flow Oxygen at 15 L/min, removal of PPE, cooling with fanning under air conditioning, and 1 Liter of cold intravenous Normal Saline. He regained consciousness and orientation within one hour and was transferred to a nearby hospital for further monitoring.

2.4. Outcome and Follow-up

The patient remained stable throughout 24 hours of hospital observation and was discharged the next day without complications. Follow-up at the rig clinic confirmed full recovery and return to baseline function.

3. Discussion

This case illustrates an atypical presentation of heat stress in an occupational setting. The initial ACS-like chest pain was likely caused by cardiovascular strain, dehydration, and impaired thermoregulation [5]. Neurological complications, including seizures, can occur unpredictably in heat stroke due to direct thermal effects, cerebral hypoperfusion, or electrolyte disturbances [6,7].

Occupational risk factors in this case included prolonged heat exposure, restricted ventilation due to PPE, and lack of electrolyte-containing fluids [3,8]. Prompt recognition and management with seizure control, active cooling, Oxygen therapy, and fluid resuscitation were critical in preventing morbidity.

4. Conclusion

Heat stress should be considered in the differential diagnosis of chest pain and dyspnea in workers exposed to extreme heat. Convulsions may develop rapidly and unpredictably. Early recognition and immediate supportive treatment in resource-limited settings can be lifesaving. Preventive measures, including adequate hydration, rest breaks, PPE modifications, and training, are essential in high-risk occupational environments.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Written informed consent was obtained from the patient for publication of this case report.

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