

Exertional Heat Stroke - Golden hour is the Key to Success: A Report from Peripheral Military Hospital of Northern India

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Sir,

Exertional heat stroke (EHS) is an acute medical emergency with poor outcomes if not treated in time.¹ We present our experience of treating nine patients of EHS and their successful outcome from peripheral hospital of northern India.

Total of 24 patients brought post exercise with heat related illness in the month of August and September. Out of these cases, nine were diagnosed as EHS with median age of 30 years (range: 18-36). The median rectal temperature was 104.5°F. The baseline clinical features and laboratory parameters are listed in Table 1. All patients were delirious at presentation with seizures in 18% of cases. Treatment started immediately with aggressive and rapid evaporative cooling. Patients were made naked, covered with wet cotton sheet and continuously cold water was splashed. Combination of other methods were used for non-responding patients with ice packs put over inguinal and axillary regions. Gastric lavage with ice cold water used for one patient. Continuous rectal temperature monitoring done and temperature brought to 99° F within 45 minutes to one hour. Fluid management was an integral part of management. Urine output of 50 ml/hr was maintained. Three patients had decreased urine output of < 30 ml/hour. They were treated with high ceiling diuretic inj Furosemide 10 mg to prevent myoglobin induced renal failure.

Table 1: Baseline Clinical features

| Clinical features | Patient 1 | Patient 2 | Patient 3 | Patient 4 | Patient 5 | Patient 6 | Patient 7 | Patient 8 | Patient 9 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Rectal temperature (°F) | 104.3 | 105.1 | 106 | 104.2 | 104.5 | 105.4 | 105.9 | 104.3 | 104.2 |
| Tachycardia (>120/MIN) | + | + | + | + | + | + | + | + | + |
| Systolic BP (< 90 mmHg) | - | - | - | - | - | - | - | + | - |
| Seizure | - | - | - | - | - | + | - | + | - |
| Delirium [#] | + | + | + | + | + | + | + | + | + |
| Diarrhoea | + | + | + | + | + | + | + | + | + |
| Oliguria (<30 ml/hour) | - | - | + | - | - | + | - | - | + |
| Respiratory symptoms | - | - | - | - | - | - | + | - | - |
| Heat acclimatisation | Done | Done | Not done | Done | Done | Not done | Done | Done | Not done |
| Alcohol consumption (night before exercise) | No | Yes | No | No | No | No | No | Yes | No |

Delirium in the form of violent behaviour, incomprehensible or irrelevant speaking; + Present, - absent

One patient had acute renal failure requiring haemodialysis for 6 weeks. All patients survived without any residual functional or neurological impairment. One patient suffered from rebound hyperthermia during the course of treatment. Three patients went on to develop mild hypothermia which recovered subsequently, possibly benefitting with mild hypothermia.² Six patients (66%) developed hypocalcaemia and lactic acidosis. Delirious patients were sedated using inj. Diazepam (88.89%), and non-responders were treated with (66.67%) continuous Inj. Propofol infusion for 12 to 16 hours. All patients recovered completely and were discharged from the hospital at mean 9 days of hospitalisation.

Rapid cooling is the treatment for EHS.¹ Ice Cold Water Immersion is the method of choice but it is not readily available and practical issues are associated with it.³ In practice, combination of various methods is used. Deshwal et al reported clinical and biochemical parameters of 78 patients of EHS.⁴ All patients were paratroopers and evaporative cooling method was used immediately upon reception of patient. They also reported similar experience with no mortality. Tong et al reported 26.5% of mortality

among 68 patients of exertional heat stroke with infections.⁵

Time to start treatment is the most important factor in deciding outcome as it is for acute myocardial infarction. Immediate start of treatment improves outcomes.

We highlighted importance of the golden hour concept of heat stroke management. Evaporative cooling is the field method of cooling and can be used where ice water immersion facility is not available. The end point of cooling is matter of debate, the lower threshold of 99°F should be prospectively studied in future clinical studies.

References

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