A TREATMENT ALGORITHM FOR MASS HEAT CASUALTIES

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Abstract

Although thankfully rare, heat related illness has significant implications for the effective fighting force available to commanders. This is especially pertinent in the current theatres of operations, as previously soldiers have not routinely been subjected to the rigors of operating in hot climates. In addition to Iraq and Afghanistan, various training exercises are undertaken throughout the world where extreme temperatures may be encountered. Individual medical officers may be faced with heat casualties remote from all but the most basic facilities or the number of heat casualties may overwhelm limited resources. We present a simple treatment algorithm that has been used successfully in the treatment of mass heat casualties.

Introduction

Heat related morbidity during military operations or training continues to make headlines in the mainstream media despite stringent preventive measures being in place. Three soldiers serving on OP TELIC have had heat related illnesses recorded as the cause of death by HM Coroner [1]. Between September 2004 and July 2006, 284 heat casualties were reported from Iraq, 80 of whom required hospital admission or bedding down, whilst there were 33 heat casualties in a four month period in 2006 in Afghanistan [1].

The incidence of heat injury has declined steadily over the last 100 years from a rate of 75 per 1000 in the Mesopotamian campaigns of 1917 to 24 per 1000 for troops conducting EX SAIF SERREA in 2001 [2]. Current guidance on prevention of heat illness are contained in JSP 539 [3], although it has been suggested that they pertain primarily to *exertional* heat illness rather than the classical heat illness dealt with in the Role 1Heat Illness Unit during OP TELIC II. This Heat Illness Unit described the use of pulse goniometry, ECG monitoring and electrolyte analysis in the management of their 300 heat casualties over a one month period [2].

In many instances such facilities will not be available, by virtue of either geographical isolation such as during Special Forces operations or by mass heat casualties overwhelming limited resources in a small Role 1 facility. We report the successful use of a simple protocol for the treatment of mass heat casualties during the 2006 Nijmegen marches.

Background

The Nijmegen marches have been held annually in July, except during the two World Wars, since 1909 around the village of Nijmegen in Holland to commemorate Dutch Officers challenging their soldiers to march a century of miles over 4 days. Up to 50, 000 people compete in the marches which cover 160 Km over 4 days. In July 2006, a British military contingent of 1700 personnel joined 6000 non-British military and 41 000 civilians in the 90th marches. The peak temperature on the first day was 42ºC, and this unusually high temperature resulted in 2725 heat casualties in one day. The majority were civilians treated in local Dutch hospitals; non-British military were treated in the military medical support facility in Hummensrood Camp and the British military casualties were treated in a Medical Reception Station (MRS) co-located with the multinational military medical support.

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Medical Capability

The UK medical support consisted of the UK Med Group, based on C (222) Med SQN 4GS Med Regiment, with augmentees from 15 other units. There was a main MRS which was primarily set up to treat the anticipated blister problems, but with a resuscitation bay and the ability to expand the acute medical capability if required. There were also 3 Medical sections, with Nursing Officers, deployed at the rest stops each day.

The MRS staff consisted of 4 Medical Officers, 8 Nursing Officers and approximately 60 CMTs [1-3], split into two daytime shifts and a smaller night shift.

Patients And Methods

Any marcher attending the MRS complaining of dizziness, lightheadedness, feeling 'hot and bothered' or with obvious signs of dehydration was identified as being a possible heat injury casualty. Heat casualties were treated according to the algorithm detailed in Figure 1.

Results

Within a 5 hour period, 75 British military heat casualties were treated within the MRS using the protocol. Twenty five responded to one litre of oral rehydration and were discharged immediately; 35 patients required one litre of intravenous crystalloid and 13 needed a further litre before being free of symptoms. Two patients remained symptomatic after 2 L of IV crystalloid, one of whom had an acute angina attack and the other who had suffered acute gastroenteritis prior to commencing the march. Both were transferred to a local Dutch civilian hospital and observed for 24 hours before being released. Due to the unprecedented number of heat casualties the marches were abandoned for the first time in their history. The following day, the 73 heat casualties in camp could be divided into three groups:

1: Those personnel (45) who successfully managed to take all 3 litres of Dioralyte (irrespective of severity of symptoms) felt normal.
2: Those (20) who took between 1.5 - 2 litres of Dioralyte (irrespective of severity of symptoms) felt somewhat better but were still mildly symptomatic.
3: Those personnel (10) who were unable to take the Dioralyte due to its impalatability all felt no better and if any thing a little worse.

Discussion

The British army publishes guidance for the avoidance of heat illness during operations [3] and training and military commanders are now much more aware of both the potential impact of heat illness and their legal responsibilities to prevent it. The ideal medical management of the heat injured casualty includes measurement of core temperature, blood chemistry and electrocardiographic monitoring. There are many circumstances where these are not available or practicable and the mass heat casualty situation is one of them.

Military personnel proven to have suffered with true heat injury are usually required to undergo assessment at the Institute of Naval Medicine, so as to assess their medical grading. If proven to be susceptible to heat stress then there are potentially career threatening consequences. It is readily accepted that the majority of "Heat injuries" are a combination of inadequate acclimatisation (usually undertaking strenuous exercise too early in the acclimatisation process), poor hydration and often superimposed minor illness, rather than more serious heat stress.

This simple protocol has been shown to be easily applicable to the mass heat casualty scenario and to achieve good results.

Conclusions

Mass heat casualties may be successfully treated using a simple treatment algorithm in the absence of more sophisticated monitoring equipment.

References

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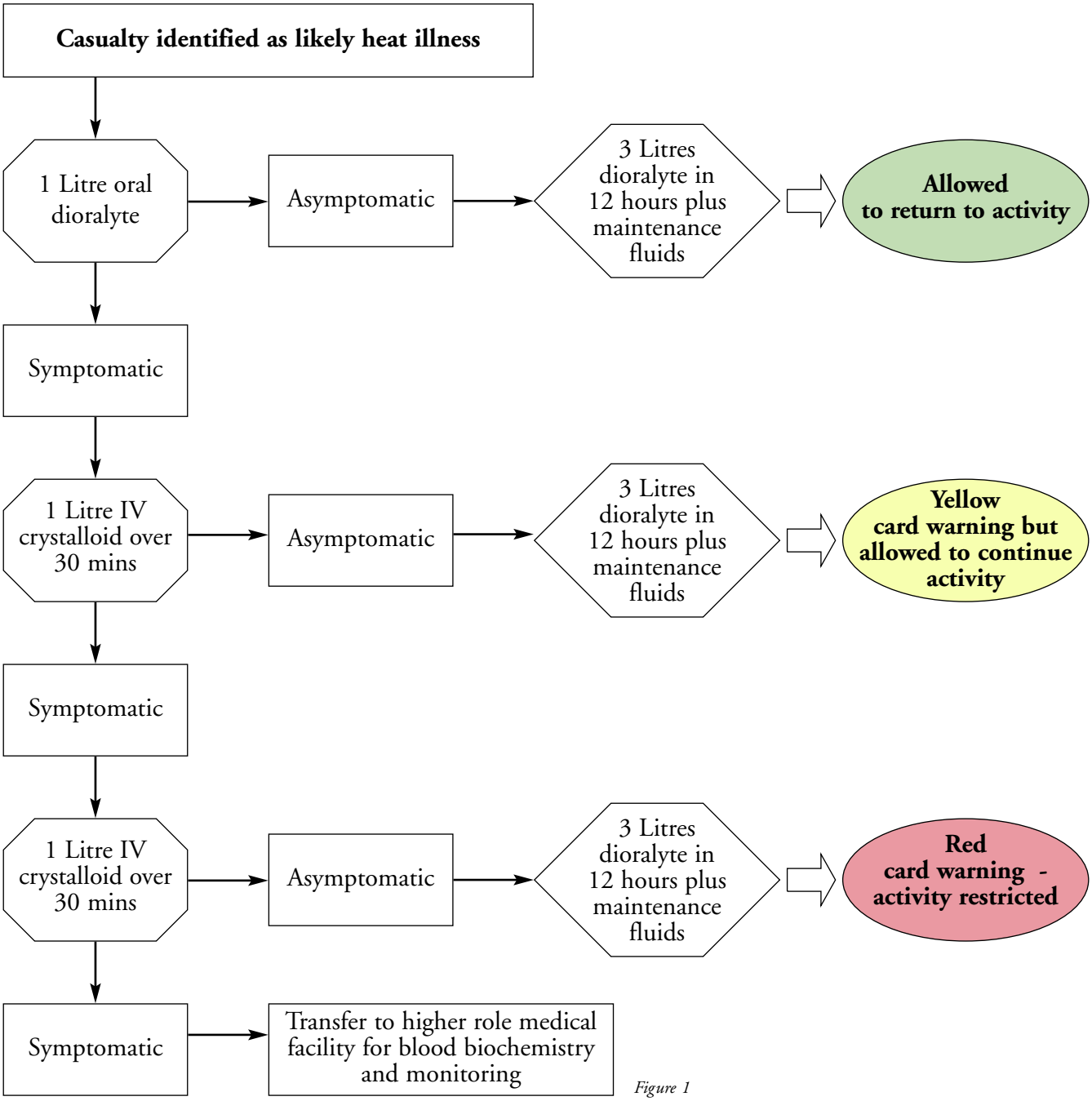

Figure 1