

Clinical & Scientific letters

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Sepsis accounts for half of early warning score triggers

Introduction

Many hospitals have a system to identify deteriorating patients using a score calculated from their standard observations. At the Birmingham Heartlands Hospital it is referred to as the modified early warning system (MEWS). Reaching a threshold score triggers the summoning of medical help and the critical care outreach (CCO) team is informed. Most unwell patients trigger outside normal working hours. This means patients are often seen by a busy junior doctor on call, who is usually unfamiliar with their case. Currently, to the authors' knowledge, there is no data regarding the causes of MEWS triggers. Since many components of the MEWS score overlap with the criteria for sepsis, we hypothesised that a significant proportion of triggers would be due to sepsis, so we prospectively studied patients with MEWS triggers to test this.

Method

Data was collected during five consecutive summer weekdays in June 2007. All adult wards were included, representing all specialties except cardiology and neurosurgery. A list of patients with a MEWS score of four or above was provided by CCO. As CCO only operate between 07:30–20:00, no patients triggering overnight were included.

Patient notes, observation charts, drug charts and computer records were viewed. Data collected included age, gender, date and time of the trigger, components of the MEWS score (heart rate, respiratory rate, temperature, conscious level, urine output, systolic blood pressure and oxygen saturations), white cell count within 24 hours of the trigger and the working diagnosis. Also noted was whether microbiological sam-

ples were taken, whether the patient was already receiving antibiotic therapy or if this was commenced or changed as a result of the trigger.

Sepsis was defined as having confirmed or clinical evidence of infection, plus two or more of: temperature >38 or <36 , pulse >90 , respiratory rate >20 , white blood count $>12,000$ or <4000 . Severe sepsis was sepsis with one or more of: confusion, oliguria, hypoxia, acidosis or disseminated intravascular coagulation (DIC). Septic shock was classified as severe sepsis with hypotension despite fluid resuscitation. Each patient was followed up at two weeks.

Results

A total of 35 patients were studied over five days. Ages ranged from 18–89 years and MEWS scores ranged from 4 to 9. Tachycardia and tachypnoea were the most common factors contributing to a MEWS score. Of these patients, 18 (51.4%) had sepsis. Within this group, 16 (45.7%) had severe sepsis and one (2.9%) had septic shock. Blood cultures were taken from only 10 of the 18 septic patients, only one of which was positive and of doubtful significance. However, seven of the nine patients with negative blood cultures were already receiving antibiotics. Only six midstream urine (MSU) samples were taken in total, three being from septic patients (only one with suspected urinary tract infection). One sample was cultured revealing no growth. The remaining five were not cultured due to absence of significant pyuria. Two of these six patients were already on antibiotics. Half of CCO calls are received in the first third (4.5 hours) of their working day, suggesting that patients who are unwell overnight wait until morning to be referred. At two week follow up, 11.4% of all patients had been treated in the high dependency unit or the intensive therapy

unit. Half (51.4%) of the patients were alive and discharged, nearly a third (28.6%) were alive in hospital, while a fifth (20.0%) had died.

Discussion

This suggests that half of all MEWS triggers are due to sepsis. This is rarely confirmed by microbiology, often because samples are not taken, or because patients are already on antibiotic therapy, thus reducing the chance of a positive growth. We recommend that for all suspected cases of infection, blood cultures and MSU should be sent as a minimum septic screen before antibiotics are commenced. The need for prompt antibiotic review and administration must be emphasised, while the patient with septic shock should be resuscitated with a fluid challenge. Our CCO service is now being extended to give around-the-clock cover and their remit has been enlarged to include review of antibiotic administration.

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