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Staphylococcus aureus carriage predisposes to pneumonia in the head injured

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Head injury, pneumonia, *Staphylococcus aureus*

Comments

This is a clear and well conducted study demonstrating the marked increased risk of serious *S. aureus* infections in trauma patients with pre-existing nasal carriage of this organism compared to those without, and most particularly in isolated head/c-spine injured patients compared with patients with other trauma.

The not unsurprising consequence of this was a significant increase in the length of hospital stay for those patients who developed infection (pneumonia or bacteremia). No data on mortality are presented. Are we to assume all patients survived?

The obvious question is what to do about this in order to reduce morbidity, mortality and costs and the authors address various options in their discussion. Patients at risk are easily identified by simple nasal swabs at admission. Use of systemic antibiotics in NC+ patients is possible but carries the risk of resistant strains emerging, compounding the problem, and is also expensive as the majority would not get the infection anyway. Topical use of mupirocin is a less expensive option but may be inadequate if the organisms have already spread to the upper airways. Use of non-absorbable antibiotics for selective oropharyngeal decontamination is a further solution. Clearly a randomised trial addressing this issue is needed.

Introduction

Aproximately 15-25% of the general public are nasal carriers of colonies of *Staphylococcus aureus* (*S. aureus*). Certain individuals, such as dialysis patients, are at increased risk of colonisation and therefore at greater risk of *S. aureus* infection. *S. aureus* pneumonia is common in victims of blunt trauma and also in neurosurgical patients.

Aims

To assess whether pre-existing nasal colonization with *S. aureus* in head injured and high cervical spine (c-spine) injured patients leads to an increased incidence of *S. aureus* pneumonia.

Methods

Anterior nasal cultures were taken from 776 trauma injury patients, admitted to the R Adams Cowley Shock Trauma Center, University of Maryland. Cultures were taken within 72 h of the patient's arrival. Patients were subsequently monitored for the development of *S. aureus* infections. Records of site of infection, length of hospital stay and antibiotics administered were also taken for those patients who did develop *S. aureus* infection.

Results

Of the 776 (18.7%) patients, 114 were nasal culture positive (NC+) for *S. aureus*. Of these NC+ patients, 40 had isolated head or c-spine injuries, with the remaining 104 sustaining non-isolated head or c-spine injuries. A total of 11 out of the 40 (27.5%) NC+ patients with isolated head injuries developed *S. aureus* infection, with 8 out these 11 developing *S. aureus* pneumonia. Of the 104 (10.5%) NC+ patients with non-isolated head or c-spine injuries, 11 developed *S. aureus* infections, 4 of which developed pneumonia. The difference between the incidence of *S. aureus* infection, and also of *S. aureus* pneumonia, in isolated head or c-spine patients compared to that in non-isolated head or c-spine patients was significant ($P < 0.01$, two-tailed Fisher's Exact Test). Only 2.1% of NC- patients developed subsequent *S. aureus* infections. The length of hospital stay was significantly longer for NC+ patients who developed *S. aureus* infections compared to those NC+ patients who did not.

Discussion

The data presented in this paper suggest that nasal carriage of *S. aureus* is an important risk factor for the subsequent development of *S. aureus* infection, especially *S. aureus* pneumonia, in trauma victims. In particular, patients with head or high c-spine injury appear to be at a greater risk of subsequent infection. This could be due to aspiration at the time of injury, or emergency nasal intubation. In four out of seven patients it was confirmed that the *S. aureus* isolate that colonised the nares was the same as that which caused *S. aureus* pneumonia, indicating the source of infection. The authors suggest that patient morbidity and hospital costs could be reduced by simple nasal culture to identify those at higher risk. Preventative measures could thus be taken, for example, the administration of systemic or nasally applied antibiotics.

References

1. Campbell W, Hendrix E, Schwalbe R, Fattom A, Edelman R.: Head-injured patients who are nasal carriers of *Staphylococcus aureus* are at high risk for *Staphylococcus aureus* pneumonia. Crit Care Med. 1999, 27: 798-801.