

Early onset pneumonia post cardiac arrest in the era of normothermia

South West Anaesthesia Research Matrix

Introduction

Early onset pneumonia (EOP) is common in patients treated with mild therapeutic hypothermia (MTH) following cardiac arrest (up to 65%)¹ and is linked to increased length of mechanical ventilation and length of stay. Recent evidence suggests that these patients can be treated using targeted normothermia with no adverse effect upon their survival or neurological outcome². A change in temperature management practice may result in an alteration in the incidence of EOP.

Aim

To conduct a prospective regional observation study to define the incidence of EOP in a UK cohort in the era of targeted normothermia.

Methods

This observational study was conducted by the South West Anaesthesia Research Matrix (SWARM) across the six trusts in our network. Data on all patients admitted to the intensive care unit (ICU) following a cardiac arrest during a three-month period was collected using paper CRFs, anonymised and centralised for analysis. EOP was diagnosed in patients with either 1) positive chest examination findings **or** 2) chest radiograph changes AND either 1) a positive sputum culture **or** 2) purulent sputum with a PaO₂ / FiO₂ < 33kPa¹. Demographic and treatment data was also collected. This study was approved as a service evaluation by the research and development departments at each hospital involved and so ethical approval was not required.

Results

This is an interim analysis. Fifty-six patients were recruited into this service evaluation (Site 0 = 10, site 1 = 4, site 2 = 17, site 3 = 2, site 4 = 21, site 5 = 2), 45 (75%) following out-of-hospital cardiac arrest (OHCA) and 32 (57%) following VF / VT. N for 1) antibiotics on admission = 31 (55%, empirically prescribed in 20) 2) percutaneous coronary intervention = 23 (41%) 3) temperature management = 45 (80%). In terms of temperature management, the most common target range was 36-37 Celsius (80%). 20 patients were diagnosed with EOP (36%). Treatment with antibiotics on arrival to ICU did not significantly reduce the chances of developing an EOP (RR 0.79, ARR 0.09, Fisher's exact test 0.58). ICU mortality was 50%, hospital mortality was 64%.

Discussion

This is the first description of EOP incidence in a UK cardiac arrest cohort to the best of our knowledge. EOP appears to be less common in patients managed with 36 Celsius targeted temperature therapy compared to previous (USA) MTH cohorts. The vast majority of patients managed on the ICU with temperature control following a cardiac arrest were treated with normothermia. Early treatment with antibiotics did not prevent the development of EOP.

References

1. Perbet S. Early-Onset Pneumonia after Cardiac Arrest. *American Journal of Respiratory and Critical Care Medicine* 2011;184:1048–54.
2. Nielsen N. Targeted Temperature Management at 33C versus 36C after Cardiac Arrest. *New England Journal of Medicine* 2013;1–10.