

**Coagulation changes during mild hypothermia in
neonates on extracorporeal membrane oxygenation
(ECMO)**

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Abstract

Hypothermia is a promising intervention for reducing cerebral ischaemic damage. Neonates who need extracorporeal membrane oxygenation (ECMO) are inherently ill and are at risk of cerebral damage. Studies have shown hypothermia to be neuroprotective, but its effect on coagulation incorporating conventional and temperature adjusted blood tests have not been studied. We aimed to look for a difference in coagulation between neonates who undergo ECMO at mild hypothermia (34°C) and those at normothermia (37°C).

A prospective, single-centre study was done from October 2006 to November 2008: Babies were randomised to “cooled” and “non-cooled” groups. Blood sampling was done at six time points. Thromboelastography (TEG) values at 34°C and 37°C, routine coagulation tests and cytokines were studied. Requirements of blood products and heparin and clinical effects were noted.

There were 16 neonates and eight were cooled. Mean age was 1.2 days; mean weight, 3.4 kg and total ECMO, time 1877 (mean 117.3) hours. Eight (50%) were males. Mortality was one (6.3%). Data was analysed using the Mann-Whitney Test. Mild hypothermia caused reduced platelet count ($p=0.001$) and function ($p=0.03$) at 12 hours post- ECMO and reduced clot formation by 24 hours ($p=0.02$), after which differences disappeared. Temperature adjusted functional coagulation tests were needed to detect these effects. Heparin requirement was less in the cooled group ($p=0.002$). No differences in cytokines were evident. No adverse effects were noted due to hypothermia. This is the first study of functional and conventional coagulation tests during mild hypothermia in neonates on ECMO.

Key words: Extracorporeal systems, ECMO, hypothermia, coagulation, neonates