NEUROPROTECTIVE EFFECTS OF EARLY EPO IN PRETERM INFANTS: AN MRI STUDY

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Backgrounds and aims: With steady prematurity rates and increasing number of surviving extremely preterm infants, the risk to develop encephalopathy of prematurity characterised by white matter (WM) injury, WM loss and subsequent abnormalities in cortical development and long-term neurodevelopmental delay, has become a major concern in neonatal care (1). Erythropoietin (EPO) is known to be neuroprotective. The aim of this study is to demonstrate that early EPO treatment of premature babies has a neuroprotective effect that can be seen on MRI at term equivalent age (TEA).

Methods: 3T MRI was obtained at TEA in 100 preterm infants (PT) who had been randomized to either EPO or placebo treatment. Semi-quantitative assessment of WM injury, grey matter injury, cerebellar growth and brain maturation was done with an established scoring method known to predict neurodevelopmental outcome (2).

Results: A significantly lower WM injury score (6.68 ± 0.159 vs 7.32 ± 0.289 , $p=0.004$) with less WM abnormalities and less periventricular WM loss was found in the EPO treated group, even when adjusted for GA or birth weight. No significant differences were found in grey matter and cerebellum injury score, measures of cerebellar growth and maturation.

Conclusions: Early EPO treatment in high risk PT reduces WM abnormalities and WM loss. These are the first data from a randomized controlled trial on the neuroprotective role of EPO in the PT indicating clear benefit with a reduction of the early imaging biomarkers of encephalopathy of prematurity.

1. Volpe JJ. Lancet Neurol 2009;8(1).
2. Woodward LJ, N Engl J Med 2006;355(7).