Erythropoietin for Hypoxic-Ischemic Encephalopathy:
A Follow up Study in New Taipei City, Taiwan

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Background: Recent several trials of erythropoietin (Epo) treatment are reviewed: Two phase I/II trials of high-dose Epo given to preterm infants established pharmacokinetic and safety profiles, and a trial of Epo treatment for term infants with moderate hypoxic-ischemic encephalopathy (HIE) found reduced disability. Perinatal asphyxia, intraventricular hemorrhage and stroke are common causes of neonatal brain injury, with hypoxia-ischemia as the final common pathway of injury. Epo has potential to lessen neurologic sequelae due to hypoxia-ischemia. The purpose of this review is to highlight new clinical trials and experimental evidence that expand our understanding of Epo as a potential treatment for perinatal brain injury. Potential risks and benefits of high-dose Epo are discussed.

Methods: We retrospectively reviewed the charts of 9 infants, from 2018 to 2022, clinically presenting with hypoxic-ischemic encephalopathy due to fetal distress or perinatal insults. The first trial of Epo therapy for neuroprotection in term infants born > 37 weeks with moderate to severe hypoxic-ischemic encephalopathy (HIE) has now been completed. Epo-treated term babies received 1000 U/kg at day one, two, three, five and seven (D1, 2, 3, 5, 7) with the first dose administered by 48 hours of life.

Results: Nine infants, all term birth, were enrolled. Epo treatment improved neurologic signs at 7 days, 12 months and 24 months as assessed by Bally (Thompson Neurologic Assessment), reduced disability for moderate HIE, decreased the overall number of cerebral palsy at 18 months of age. Disability at 18 months was present in 43.8% of controls compared to 24.6% of Epo-treated subjects. Consistent with trials of hypothermia for HIE, Epo was only effective for infants with moderate injury, and did not improve outcome for severely-affected infants.

Conclusion: EPO is an effective agent to treat HIE. These eight term newborn has better results in both short-term and long-term outcomes. The result reveals clinical response to EPO therapy in 84.6% of patients within the first 2 months.

Keywords: Epo, EPO, erythropoietin, HIE, hypoxic-ischemic encephalopathy, asphyxia, Sarnat, cerebral palsy, disability