

HANSRAJ NAYYAR AWARD PAPER

Cerebral perfusion pressure targeted therapy improves the long-term outcome in children with raised intracranial pressure due to acute central nervous system infections

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Background: In developing regions, mortality and neurodisability among survivors of childhood acute central nervous system (CNS) infections can be as high as 50%. **Objective:** The objective of the present study is to compare the long-term neurological outcome between cerebral perfusion pressure (CPP) versus intracranial pressure (ICP)-targeted therapy in children with raised ICP due to acute CNS infections. **Methods:** Design: Prospective open-label randomized controlled trial in level-III pediatric intensive care unit (PICU). Period: July-2007 to September-2013. Participants: 110 children, aged 1-12 years, consecutively admitted to PICU with raised ICP and modified-Glasgow coma scale score ≤ 8 . Interventions: Patients were randomized to receive either CPP-targeted ($n = 55$) (maintaining CPP ≥ 60 mmHg)

or ICP-targeted therapy ($n = 55$) (maintaining ICP < 20 mmHg). Intraparenchymal pressure transducer (CODMAN®) was used for ICP monitoring. Follow-up: Survivors were followed up to median period of 5-years. Functional status assessment using pediatric cerebral performance category and pediatric overall performance category scale were performed by an examiner blinded to protocol assignment. Outcome: Functional status up to 5-years on follow-up. **Results:** Survivors were higher in CPP-group than ICP-group ($n = 45$, 81.8% vs. $N = 34$, 61.8%; risk ratio (RR) = 0.76, 95% confidence interval (CI) = 0.59-0.96; $P = 0.020$) and completed the median (interquartile range) follow-up of 5 (4.3-5.8) years. Number of survivor with normal functional status was higher in CPP-group than ICP-group at PICU-discharge (46.7% vs. 17.6%; RR = 0.64, 95% CI = 0.17-0.84, $P = 0.007$), at 1-year (68.9% vs. 44.1%; RR = 0.64, 95% CI = 0.42-0.98, $P = 0.027$), at 3-years (77.8% vs. 50%; RR = 0.44, 95% CI = 0.23-0.84, $P = 0.010$) and at 5-years (80% vs. 53%; RR = 0.66, 95% CI = 0.47-0.94, $P = 0.010$). Hearing deficit was lower in CPP-group than ICP-group (8.9% vs. 38.2%; RR = 0.23, 95% CI = 0.08-0.65, $P = 0.002$). **Conclusion:** CPP-targeted therapy improves the long-term neurological outcomes.