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Long-term functional outcome following severe childhood traumatic brain injury: results of the prospective longitudinal follow-up of the TGE cohort

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Introduction: The aims of this study were to study functional outcome over 24 months following childhood severe traumatic brain injury (TBI); and to determine how initial functional status predicts 7-year intellectual and academic outcomes.

Patients and Methods: Children (0–15y) consecutively admitted in a single trauma center, following severe accidental TBI, were included in a prospective longitudinal study (TGE cohort). At 3, 12, 24 months, and 7 years, disability, functional, intellectual, and educational outcomes were assessed (paediatric Glasgow Outcome Scale; GOS-Ped, Paediatric Injury Functional Outcome Scale; PIFOS; Wechsler scales; mainstream school vs special education).

Results: 65 children survived (66% males; mean age at injury 8.1y [SD=4.6]; lowest Glasgow Coma Scale 6.1 [1.8]; length of coma 6.6d [4.8]). GOS-Peds indicated severe impairments at 1 month (vegetative state: 8%, good recovery: 6.5%), with significant improvement over time (25% 'good recovery' by 24mo). Functional impairments were severe initially, improved by 3 and 12 months ($p<0.0005$), without subsequent significant progress. At each time-point, PIFOS score was highly correlated to TBI severity (length of coma [$p<0.0004$] and to GOS-Ped scores ($p<0.0001$)). 12-month PIFOS score was highly correlated to full-scale IQ at 12, 24 months ($p<0.0001$) and 7 years ($p<0.004$), and significantly predicted the type of education ($p<0.0001$ at 12 and 24mo; $p<0.002$ at 7y).

Conclusion: Functional status at 1 and 2 years significantly predicts long-term intellectual and educational outcomes. Systematic personalised long-term follow-up should be organised, with increased attention for those with persistent functional impairment 12-months post-injury.