

TRAUMATIC DISORDERS

NEUROBEHAVIORAL OUTCOME AFTER EARLY CHILDHOOD HEAD INJURY

Neurobehavioral function following traumatic brain injury (TBI) in a school-aged population, recovery over a period of 30 months post-injury, and predictors of outcome were studied in three groups of children treated at University of Melbourne, Royal Children's Hospital, Australia. Intellectual, language and memory functions were measured immediately after injury and at 12 and 30 months post-injury, using a prospective, longitudinal design. Patients (aged 2.0-6.1 years at injury) were in three TBI groups: mild (14), moderate (46), severe (34), and a healthy control group (33). Pre-injury behavior, psychosocial function, age and gender were comparable in the 4 groups. Tests of *intellectual function* showed group differences in the WPPSI-R and WISC-III full-scale, verbal and performance scores, and significant differences between moderate and severe TBI groups, severe TBI being associated with poorer performance in each instance. *Language test scores* were related to severity of TBI, with significant differences among groups for expressive and receptive skills. Children with severe TBI had mild to moderate impairments in language function. Improvements occurred over the 30 months post-injury period in all groups on all measures of expressive language, but improvements in receptive language were minimal and the deficit identified acutely with severe TBI was maintained. *Memory and learning impairments* with severe TBI were persistent, with no evidence of improvement over time, whereas mild and moderate TBI groups performed similarly to healthy controls. Injury severity was the most reliable predictor of long-term neurobehavioral recovery following early TBI; the more severe the injury and depth of coma (on GCS at 24 hours post-injury), the less chance of recovery and poorer the outcome for intellectual, memory, and receptive language functions. Environmental factors, including parental occupation and pre-injury child adaptive abilities, and age contributed to outcome, whereas pre-injury child behavior was not predictive. (Anderson VA, Morse SA, Catroppa C et al. Thirty month outcome from early childhood head injury: a prospective analysis of neurobehavioral recovery. **Brain** December 2004;127:2608-2620). (Respond: Vicki Anderson PhD, Department of Psychology, Royal Children's Hospital, Flemington Road, Parkville, Victoria 3052, Australia).

COMMENT. Long-term neurobehavioral impairment following traumatic brain injury in early childhood is correlated with the severity of the injury and also, with lower pre-injury adaptive abilities and lower socio-economic status.

Children with severe TBI, when tested at least 1 year post-injury, performed significantly worse than age-matched controls on word- and discourse-level measures of selective learning efficiency, in a study of 6-16 year-old children followed at Baylor College of Medicine, Houston, TX (Hanten GH et al. **Ann Neurol** Dec 2004;56:847-853). The authors postulate that children with severe TBI have impairments in cognitive control, possibly caused by involvement of frontal neural connections. They have difficulty in selecting and learning items of importance when studying text-based material.