

HYDROCEPHALUS IN CHILDREN

Epidemiology and outcome

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This thesis is based on the following papers:

- I Eva-Karin Persson, Gudrun Hagberg, Paul Uvebrant
Hydrocephalus prevalence and outcome in a population-based
cohort of children born in 1989-98.
Acta Paediatr 2005; 94:726-732
- II Eva-Karin Persson, Gudrun Hagberg, Paul Uvebrant
Disabilities in children with hydrocephalus-a population based
series of children aged four to twelve years.
Neuropediatrics 2006; *accepted for publication*
- III Eva-Karin Persson, Susann Andersson, Lars-Martin Wiklund,
Paul Uvebrant
Hydrocephalus in children born in 1999-2002. Epidemiology, out
come and ophthalmological findings.
2006; Submitted for publication
- IV Susann Andersson, Eva-Karin Persson, Eva Aring, Barbro
Lindquist, Gordon N Dutton, Ann Hellström
Vision in children with hydrocephalus
Dev Med Child Neurol 2006;48:836-841



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Epidemiology and outcome

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Aims: To analyse trends in the live-birth prevalence of infantile hydrocephalus and hydrocephalus associated with myelomeningocele (MMC) during the period 1989-2002 and to study the outcome in terms of learning disability, cerebral palsy, epilepsy and visual deficits. Another objective was to explore motor function and disability profiles in various aetiological and gestational-age subgroups and to see whether treatment complications and neuroradiological findings correlate with outcome.

Material and methods: A population-based study of all 262 live-born children with infantile hydrocephalus and hydrocephalus associated with MMC born in 1989-2002 in western Sweden. Aetiological and clinical information was collected from medical records, neuroimaging and ophthalmological examinations. A subgroup of 114 children were clinically examined and interviewed.

Results: The live-birth prevalence of hydrocephalus was 0.77 per 1,000 live births, 0.48 for infantile hydrocephalus and 0.29 for hydrocephalus associated with MMC. The prevalence of infantile hydrocephalus decreased from 0.55 in 1989 to 0.48 per 1,000 in 2002, while that of MMC decreased from 0.35 to 0.16 per 1,000 during the same period. The prevalence in children born extremely preterm increased dramatically, with a gestational-age-specific prevalence of 13 per 1,000 in 1989 compared with 45 per 1,000 live births in 2002. During the same period, the perinatal mortality in these children decreased from 40 to 15 per 1,000 live births. A ventriculo-peritoneal shunt was the first surgical intervention in 230 children (88%), while an endoscopic ventriculostomy was performed in 31 (12%). At least one surgical revision was required in 64% of the children. Of children with infantile hydrocephalus, 63% had at least one associated impairment, compared with 33% in the MMC group, apart from the consequences of the spinal lesion. Visual and other ophthalmological impairments were identified in the majority of the children. Very preterm birth was associated with a high risk of visual impairment. No child with normal neuroimaging had any associated neurological or visual impairment, compared with eleven of twelve with impairments in children with generalised parenchymal lesions.

Conclusions: A decrease in the prevalence of infantile hydrocephalus was noted during the period 1989-1998, but it did not continue in 1999-2002. The stagnation was mainly explained by the increased survival of children born extremely preterm with post-haemorrhagic hydrocephalus. The aetiology of the hydrocephalus and gestational age at birth were important for outcome. The majority of the children had some associated neuroimpairment, such as learning disability, cerebral palsy or epilepsy, and more than three-quarters had ophthalmological abnormalities. Neuroimaging was found to be useful for aetiological, treatment and outcome considerations.

Key words: Prevalence, epidemiology, hydrocephalus, MMC, treatment, outcome