

Oral Presentation

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## Learning disabilities in a population-based group of children with hydrocephalus

L Barbro\*, G Carlsson, E-K Persson and P Uvebrant

Address: Child Psychology Department, Fiskaregatan, Halmstad, Sweden

Email: L Barbro\* - Lindquist\_barbro@hotmail.com

\* Corresponding author

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### Clinical background

The aim of this study was to assess cognitive functions in a population-based group of children with hydrocephalus. Specific questions to be answered were whether the cognitive outcome differed between children with and those without myelomeningocele (MMC) associated to the hydrocephalus and to see if there was a difference between the children with hydrocephalus present already at birth and those who developed it later during the first year of life, and thirdly to compare children who were born at full term with those born at earlier gestational ages.

### Materials and Methods

Of all 103 children with hydrocephalus born 1989–1993 in the region, 73 were included in the study. Six children had died, and the 24 lost to follow-up did not differ from the study-group with respect to background variables. Intelligence was assessed with the Wechsler Intelligence Scales or the Griffith Developmental Scales.

### Results

One third of the children were normally gifted with an IQ over 85, and another 30% had a low average IQ in the range 70–84. Learning disabilities of a more severe degree with an IQ less than 70 was found in 37% of the children. The median IQ for the whole group was 75. The median verbal IQ (VIQ) in those possible to fully assess was 89 and the median performance IQ (PIQ) 76 ( $P < 0.001$ ). An IQ  $< 70$  was found in 42% of the 45 children without MMC, and in 29% of those 28 with MMC. The children without MMC had a median IQ 76 compared to 75 in those with MMC. The IQ-levels in children without MMC varied more than in children with MMC. The latter clustered around the IQ-range 70–85. The 21 (29%) children who were born preterm had a lower IQ (68) than the 52

born at full term (IQ 76), and the 28 (38%) children born with hydrocephalus had a lower IQ (72) than the 45 who developed hydrocephalus later on (IQ 77). Children with cerebral palsy and/or epilepsy ( $n = 22$ ) added to the hydrocephalus had a lower IQ (66) than those without associated impairments (IQ 78) ( $P < 0.01$ ).

### Conclusions

Children with hydrocephalus need a thorough neuropsychological assessment before school-age to ensure adequate support and education. Even the one third near normally gifted children with IQ 70–85 needs special attention due to the well-known profile with relatively well preserved verbal functions but greatly impaired perceptual and non-verbal abilities.