OBSTETRICAL BRACHIAL PLEXUS PALSY

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This thesis is based on the following papers:

I Mollberg M, Hagberg H, Bager B, Lilja H, Ladfors L.
High birthweight and shoulder dystocia: the strongest risk factors for obstetrical brachial plexus palsy in a Swedish population-based study. *Acta Obstet Gynecol Scand 2005: 84: 654-9.*

II Mollberg M, Hagberg H, Bager B, Lilja H, Ladfors L.
Risk factors for obstetrical brachial plexus palsy among neonates delivered by vacuum extraction. *Obstet Gynecol 2005; 106: 913-18.*

III Mollberg M, Wennergren M, Bager B, Ladfors L, Hagberg H.
Obstetric brachial plexus palsy: a prospective study on risk factors related to the manual assistance during the second stage of labor.
Acta Obstet Gynecol 2007; 86:198-204.

IV Mollberg M, Lagerkvist A-L, Johansson U, Bager B, Johansson A, Hagberg H, Uvebrant P.
Comparison of infants with transient and persistent obstetric brachial plexus palsy: differences in obstetric management. *Manuscript.*

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OBSTETRIC BRACHIAL PLEXUS PALSY

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Background: Obstetric brachial plexus palsy (OBPP) at birth is one important cause of neurological disability in children and adults; the incidence has increased substantially in Sweden over the past decade. Several risk factors for OBPP have been identified, e.g. high birth weight and shoulder dystocia, but it remains difficult to predict based on antenatally available information. Despite extensive research on OBPP, there is no generally accepted strategy for prevention. The overall objective of this thesis is to study predisposing risk factors for OBPP in vaginally delivered infants and to identify specific obstetric procedures that are strongly associated with OBPP. Based on this knowledge, our ultimate aim is to develop a prevention strategy with respect to manual assistance in the second stage of labour.
Methods: Paper I reports on a retrospective case-control study aimed at investigation of the incidence and risk factors for OBPP in a large population studied in 1987-1997. All deliveries recorded in the Swedish Medical Birth Register during the period were investigated. Cases of OBPP were compared with all cases without OBPP. Paper II describes a retrospective case-control study, the purpose of which was to identify risk factors for OBPP, specifically in women delivered by vacuum extraction. The groups with and without OBPP were compared with regard to possible risk factors, including those linked to the vacuum extraction procedure. The aim of the prospective population-based case-control study presented in Paper III was to evaluate the association between OBPP and obstetric manoeuvres during the second stage of delivery. Obstetric management in OBPP cases was compared to management in a randomly selected control group. Paper IV and Paper III are based on the same cases. The aims of the study presented in Paper IV were a) to describe neurological deficits in children with remaining OBPP at 18 months of age; b) to compare maternal, infant and obstetric data in infants with and without OBPP at 18 months of age and c) to evaluate if differences in force applied in downward traction of the head (ranked on a 100-point visual analogue scale) correlated to the number of affected nerve roots (C5-C6, C5-C7, C5-Th1).
Results: The incidence of OBPP in Sweden increased from 0.17% to 0.27% between 1987 and 1997. Infants with high birth weight, especially >4500 g, were at increased risk of shoulder dystocia and OBPP. However, high birth weight was not or only weakly over-represented among children with persistent OBPP, compared with those who recovered, suggesting that other factors are important. Hence, many factors related to prolonged second stage and difficulties in delivering the shoulders were overrepresented in the OBPP group, compared to controls. In particular, forceful downward traction applied to the head after the fetal third rotation represented an important risk factor for OBPP in cephalic-presentation vaginal deliveries. Downward traction of the head had been applied more often and with greater force in the group with persistent damage and there was a significant correlation between the force used and the number of affected nerve roots.
Conclusion: We have confirmed that well known factors such as birth weight and shoulder dystocia are indeed important risk factors for OBPP. Furthermore, obstetric procedures, especially forceful downward traction of the head, conferred additional risk of OBPP at birth, as well as at follow-up at age 18 months. Our data suggest that forceful downward traction of the head should be avoided and indicate that other measures should be taken to release the impacted shoulder, e g. maximal flexion of the maternal hips, rotation of the shoulders and/ or extraction of the posterior arm.

Key words: obstetric brachial plexus palsy, shoulder dystocia, obstetrical manoeuvres
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