Predictability of Cerebral Palsy in a high-risk NICU population

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Abstract

Aim: The aim of this study was to built a model to predict individual risk on the development of cerebral palsy and its characteristics in a large cohort of high-risk infants.

Patients and Methods: 1099 consecutively NICU-admitted high-risk infants were assessed up to the corrected age of at least 2 years. CP was categorized into spastic or non-spastic, bilateral or unilateral and mild, moderate or severe CP. Several infant, perinatal and US characteristics were identified during the NICU stay. Univariate and multivariate analyses were performed. The prediction model was evaluated.

Results: : Perinatal asphyxia, mechanical ventilation > 7 days, white matter disease except for transient echodensities < 7 days, intraventicular haemorrhage grade 3 and 4, cerebral infarction and deep gray matter lesions were recognised as independent predictors for the development of CP. Gestational age, gender and multiple gestation are, although not significant in the multivariate analyses, added to the risk model. The overall measure of performance of the prediction model is 83.6%. From a predicted chance of 16.5% onwards there is a realistic possibility to develop CP. Gestational age, perinatal asphyxia and deep gray matter lesion are independent predictors in the prediction of non-spastic versus spastic CP (OR= 1.1, 3.6, 7.5). Independent risk factors for unilateral versus bilateral spastic CP are gestational age, cerebral infarction and hemorrhage grade 3 and 4 (OR= 1.1, 31, 4.6, 17.6). Perinatal asphyxia is the only retained predictor for severe versus mild and moderate CP.

Conclusion: The presented model provides a firmer basis in the prediction of the individual risk of development of CP in a large cohort of high-risk infant.