269 WHICH VARIABLES PREDICT NEONATAL ASPHYXIA IN CASES OF SHOULDER DYSTOCIA WITH PERMANENT NEUROLOGIC DAMAGE?

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OBJECTIVE: To evaluate what variables predict neonatal asphyxia in cases of shoulder dystocia with permanent brachial plexus injury (PBPI).

STUDY DESIGN: Utilizing a dataset (n = 104) of litigated deliveries resulting in PBPI, detailed delivery information was obtained by chart review. Due to the limitations of this dataset, neonatal asphyxia was defined as a 5 minute Apgar score <7. Cases with low Apgar scores at 5 minutes were compared with those with Apgar scores of 7 or greater using Fisher's exact test, Chi-square, or one-way analysis of variance with a 2-tailed $P < .05$ considered significant.

RESULTS: The length of time of the fetal head on the perineum was significantly longer in patients with 5 min Apgar <7 vs ≥7 (242 ± 131 vs 147 ± 86 min, $P = .02$). Other variables were not found to be significant (see Table).

CONCLUSION: The length of time of the fetal head on the perineum was the only significant factor in predicting 5 minute Apgar score <7 in a dataset of deliveries resulting in PBPI.

Table

	5 MIN APGAR <7	5 MIN APGAR ≥7	*P* VALUE
Gestational age (wks)	39.5 ± 2.4	39.1 ± 1.4	.5
Maternal age (yr)	26.4 ± 5.7	28.3 ± 5.4	.4
Maternal weight (lb)	193 ± 23	200 ± 37	.6
Nulliparous	38% (3/8)	27% (20/74)	.7
Diabetes	22% (2/9)	20% (13/69)	1.0
Birthweight (gm)	4326 ± 333	4191 ± 463	.4
Male gender	44% (4/9)	53% (43/81)	.6

270 SEVERITY OF RESPIRATORY DISTRESS SYNDROME IN NEONATES OF MOTHERS WITH ELEVATED ANTIPHOSPHOLIPID ANTIBODY TITERS

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OBJECTIVE: Respiratory distress syndrome (RDS) remains a significant cause of morbidity and mortality in newborns. RDS is thought to result from a deficiency of surfactant production in premature infants. Phospholipids, in particular, phosphatidylethanolamine, phosphatidylserine, phosphatidylinositol and phophatidylglycerol constitute about 80% of human surfactant. Laboratory assays of antibodies directed against these particular antiphopholipids (APLA) have been recently developed. This study was designed to evaluate the effect of elevated titers of specific maternal APLA on the severity of RDS in neonates.

STUDY DESIGN: Maternal blood samples were prospectively obtained from patients who delivered prematurely between 26 and 34 weeks gestation. These were assayed for specific APLA using standard techniques. The presence of an elevated APLA titer (any antibody) of >3 standard deviations from the mean denoted positive results. A scoring system was established based on previously published criteria to assess the severity of RDS.

RESULTS: The study population consisted of 54 pregnancies. Mean gestational age at delivery was 30.3 ± 2.2 weeks with mean birth weight of 1470 ± 541 grams. RDS was present in 24 newborns (44%); 18/24 mild and 6/24 severe. Mean birth weight of newborns with RDS was similar to that in the overall population (1331 ± 568 grams). Positive APLA titers were present in 7 mothers. Of these, 3 had severe RDS, 2 had mild RDS, and 2 did not have RDS.

CONCLUSION: Newborns with RDS are more likely to exhibit positive APLA titers of surfactant specific phospholipids in their mothers. The presence of these specific APLA titers may also contribute to the severity of RDS in newborns.

271 DOES UPPER EXTREMITY FRACTURE PREDICT DEGREE OF NEUROLOGIC INJURY IN PATIENTS WITH PERMANENT INJURY?

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OBJECTIVE: To evaluate if the presence of upper extremity fracture is associated with the degree of neurologic injury in patients who sustain permanent brachial plexus injury resulting from delivery. Clavicle fracture often occurs spontaneously or with traction-based maneuvers; fracture of the humerus often occurs late in the management of severe shoulder dystocia in an attempt to facilitate delivery. Partial (upper, C5-6; middle C5-7) or complete (C5-T1) damage to the brachial plexus results in a spectrum of residual function.

STUDY DESIGN: In a dataset of shoulder dystocia with permanent damage that resulted in litigation (n = 104), information on the presence of a fracture, location and etiology of the injury were obtained from either operative reports or neurologic exam. Comparisons were made with Chi square and one way ANOVA with $P < .05$ considered significant.

RESULTS: As shown in Table 1, there was no difference in complete neurologic injury of the brachial plexus, C5-T1 ($P = .17$) or avulsion of the nerve roots ($P = .18$) in patients whose neonate did vs did not sustain an upper extremity fracture during delivery. As expected, the number of maneuvers utilized in releasing the dystocia were significantly higher in the fracture group (2.4 ± 1.4 vs 1.5 ± 1.1, $P < .01$). There were no significant differences between the two groups in maternal weight, diabetes, nulliparity, gestational age at delivery, length of time on the perineum, operative delivery, birth weight, or Apgar score <7.

CONCLUSION: The presence of a fracture was not associated with location or severity of brachial plexus injury in a dataset of cases of shoulder dystocia with permanent damage that resulted in litigation.

Table 1

	COMPLETE INJURY	AVULSION
No fracture	39% (22/57)	33% (14/42)
Clavicle fracture	20% (1/5)	20% (1/5)
Humeral fracture	66% (6/9)	75% (3/4)

272 A POPULATION BASED ANALYSIS OF RISKFACTORS FOR BRACHIAL PLEXUS INJURY IN NEONATES: AN ANALYSIS BASED ON 1 213 987 DELIVERIES FROM THE SWEDISH MEDICAL BIRTH REGISTRY

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OBJECTIVE: To study the incidence of brachial plexus injury in neonates in Sweden and to identify risk factors for brachial plexus injury.

STUDY DESIGN: All deliveries in Sweden recorded in the nationwide Swedish Medical Birth Registry between 1987 and 1997 (n = 1 213 987) were included in the analysis. Stepwise logistic regression was used to suggest predictor variables of brachial plexus injury in neonates.

RESULTS: Brachial plexus injury was diagnosed in 2399 (0.18%) neonates. The incidence of brachial plexus injury in Sweden increased significantly during the years from 0.17 % in 1987 to 0.27% in 1994 ($P = .002$). In the stepwise logistic regression analysis, the following variables were associated to brachial plexus injury: birthweight [BW] >5000 gram Odds Ratio [OR] 85.4 (95% CI 63.3, 115.2), shoulder dystocia OR 38.1 (95% CI 33.1, 43.7), BW 4500-5000 gram OR 34.1 (95% CI, 26.2, 44.5), BW 4000-4500 gram OR 11.8 (95% CI 9.1, 15.3), breech delivery OR 8.6 (95% CI 6.8, 10.9), BW 3500-4000 gram OR 3.7 (95% CI 2.9, 4.8), vacuum delivery OR 3.6 (95% CI 3.2, 4.0), forceps delivery OR 2.4 (95% CI 1.7, 3.4), diabetes mellitus OR 2.5 (95% CI 1.7, 3.6), BW 3000-3500 gram OR 1.4 (95% CI 1.1, 1.9), secondary arrest of dilatation OR 1.3 (95% CI 1.2, 1.5), epidural anesthesia OR 1.2 (95% CI 1.1, 1.3), boy OR 0.8 (95% CI0.7, 0.8), occipito-posterior position OR 0.4 (95% CI 0.2, 0.5), caesarian section OR 0.2 (95% CI 0.1, 0.2) and protracted active phase OR 1.4 (95% CI 1.2, 1.8).

CONCLUSION: Fetal macrosomia, shoulder dystocia, breech delivery, operative vaginal delivery, diabetes mellitus, secondary arrest of dilatation and epidural anesthesia were independently associated with a higher risk for brachial plexus injury. Male gender, occipito-posterior position and caesarian section were independently associated with a lower risk for brachial plexus injury.