397 Treatment with DHA after hypoxia ischemia improves functional outcome in a rat model of perinatal hypoxia-ischemia

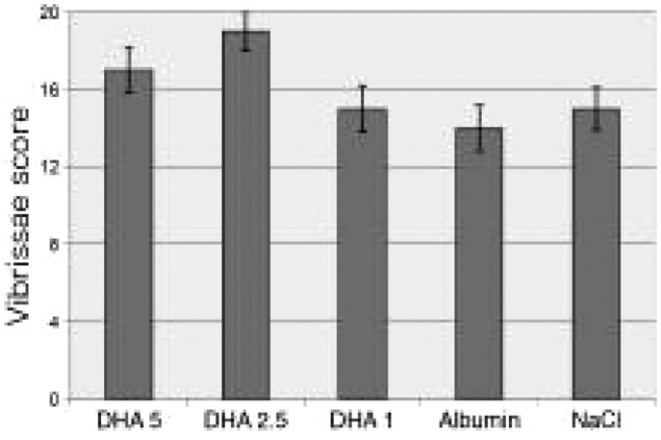
Deborah Berman[1], Ellen Mozurkewich[1], John Barks[1]
[1]University of Michigan, Ann Arbor, Michigan

OBJECTIVE: Docosahexaenoic acid (DHA) is a dietary polyunsaturated fatty acid with neuroprotective properties. We hypothesized that DHA treatment after hypoxia-ischemia (HI) would improve functional outcome and reduce brain volume loss in a rat model of perinatal HI.

STUDY DESIGN: Seven-day-old Wistar rat pups from 8 litters (N=96) were divided into 3 treatment groups and 2 control groups. Treatment groups received intraperitoneal (IP) injections of DHA 1, 2.5 or 5 mg/kg as DHA-albumin complex. Control groups received 25% albumin or normal saline (NaCl). Pups underwent right carotid ligation followed by 1.5 hours recovery at 37°C, then 90 minutes in 8% O2 to simulate cerebral HI. Fifteen minutes after HI, pups received control or treatment IP injections. At 14 days, rats underwent bilateral sensorimotor testing using vibrissae-stimulated forepaw placing response. Bilateral hemisphere and regional volumes were calculated from cortex, striatum, and hippocampus, and right hemisphere volume loss was calculated [100*(L−R)/L)].

RESULTS: Post HI treatment with DHA significantly improved vibrissae forepaw placing response (16.9±0.8 treatment vs. 14.7±0.8 controls; normal function=20 $p<.035$, t-test). The predominant effect was limited to the two higher doses (Figure). Post injury DHA treatment did not attenuate brain volume loss in any region compared to controls.

CONCLUSION: Although brain volume loss is not affected by post-ischemia DHA treatment, treatment significantly improves functional outcome, particularly in higher doses.



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398 DHA pretreatment changes the relationship between subventricular zone volume and contralateral sensorimotor function

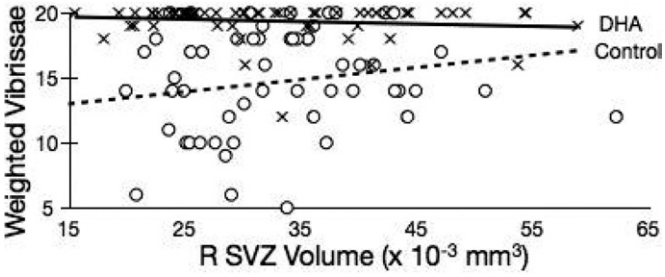
Deborah Berman[1], Ellen Mozurkewich[1], Yu Shangguan[1], John Barks[1]
[1]University of Michigan, Ann Arbor, Michigan

OBJECTIVE: Neurogenesis and proliferation occur in the rodent subventricular zone (SVZ) after cerebral hypoxia-ischemia (HI). We hypothesized that (1) SVZ volumes in rats pretreated with neuroprotective doses of docosahexaenoic acid (DHA) would increase in our model of perinatal HI and (2) this volume increase would have a positive correlation with sensorimotor function.

STUDY DESIGN: Seven-day-old Wistar rat pups from 10 litters (N=120) were divided into 3 treatment groups (intraperitoneal injections of DHA 1, 2.5 or 5 mg/kg as DHA-albumin complex) and 3 control groups (25% albumin, normal saline or no injection). Injections were given, right carotid ligation was performed, followed by 90 minutes in 8% O2, simulating cerebral HI. As we previously reported, at 14 days, DHA pretreated rats demonstrated reduction in sensorimotor deficits using vibrissae-stimulated forepaw placing response. SVZ volumes were calculated by summing bilateral SVZ areas obtained from regularly spaced coronal sections through the dorsolateral SVZ at 2.5X.

RESULTS: SVZ volumes significantly increased in right hemispheres relative to left and did not differ among treatment groups. There was a positive linear relationship between right SVZ volume and contralateral weighted vibrissae score in pooled control groups ($p<.05$). In contrast, in pooled DHA groups with higher vibrissae scores, there was no relationship between SVZ volume and function ($p=.64$). Overall there was no difference in right SVZ volume or in its relationship with right hemisphere damage severity among treatment groups.

CONCLUSION: In controls, bigger SVZ volumes correlated positively with improved function. Although SVZ volumes increased in DHA treated rats similarly to controls, function was sufficiently improved in DHA treated rats such that SVZ expansion did not correlate with improved function.



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399 Hemodynamic changes in the middle cerebral artery of fetuses undergoing laser surgery for twin-twin transfusion syndrome: evidence of cerebral autoregulation?

Paola Aghajanian[1], Samer Assaf[2], Amer Khan[2], Lisa Korst[2], David Miller[1], Ramen Chmait[1]
[1]University of Southern California/Keck School of Medicine, Maternal Fetal Medicine, Los Angeles, California, [2]University of Southern California/Keck School of Medicine, Los Angeles, California

OBJECTIVE: We hypothesized that laser surgery for twin-twin transfusion syndrome (TTTS) would result in fetal hemodynamic alterations, manifested by changes in cerebral vessel resistance with autoregulation of blood flow. The study objective was to compare the middle cerebral artery (MCA) pulsatility index (PI) and mean velocity (mean V) before and after laser surgery for TTTS.

STUDY DESIGN: A prospective observational study of TTTS patients was conducted. MCA Doppler examination was attempted within one day before and after laser surgery for TTTS. Patients were excluded from analysis if MCA Doppler measurements were unavailable (n=41) or if gestational age (GA) was less than 18 weeks (n=13). The pre- and postoperative mean (S.D.) of the MCA PI and mean V z-scores of the recipient and donor fetuses were calculated and compared. Demographic and outcome data were analyzed in relation to the MCA PI and mean V. Data were analyzed using paired t-tests and multivariable linear regression models.

RESULTS: Of 157 patients, 103 met study criteria. The MCA PI z-scores of the recipients increased from −1.29 (1.20) preoperatively to 0.14 (1.52) postoperatively ($p<0.0001$), while the donors' decreased from −0.31 (1.67) to −0.67 (1.29), $p=0.07$. MCA mean V z-scores did not change following surgery in donors and recipients. Some significant associations were identified between changes in the MCA PI and mean V and Quintero stage, GA at surgery, numbers of vessels lasered, donor growth restriction, and outcomes (GA of delivery, survival).

CONCLUSION: Post laser surgery for TTTS, the recipient's MCA PI increased toward normal values, and MCA PI values in the donor tended to decrease slightly or stabilize. There was no significant change in the MCA mean V. These findings may provide supportive evidence for autoregulatory capacity in the cerebral vessels of the midtrimester fetus.

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400 Hip dysplasia and breech presentation: prognostic value of version from breech to cephalic position on neonatal outcome

Arjon Lambeek[1], Inez Hellendoorn[2], Bettina Akerboom[2], Rien Lambers[2], Elise Brouwers[3], Marianne Den Breejen[4], Dimitri Papatsonis[1], Simone Lunshof[1], Douwe Vos[5], Sjarlot Kooi[2]

[1]Amphia Hospital, Department of Obstetrics and Gynecology, Breda, Netherlands, [2]Albert Schweitzer Hospital, Department of Obstetrics and Gynecology, Dordrecht, Netherlands, [3]Albert Schweitzer Hospital, Department of Radiology, Dordrecht, Netherlands, [4]Albert Schweitzer Hospital, Department of Pediatrics, Dordrecht, Netherlands, [5]Amphia Hospital, Department of Radiology, Breda, Netherlands

OBJECTIVE: Developmental dysplasia of the hip (DDH) is one of the most common congenital skeletal anomalies. The prevalence varies between 1 and 3 percent of all newborns. The precise pathophysiology of DDH remains unknown, but it seems to be a multifactorial problem. Breech presentation has been considered the most important risk factor. The purpose of this study was to investigate the prevalence of DDH after external cephalic version in newborns who have been lying in breech position.

STUDY DESIGN: Between March 2006 and March 2009, a prospective observational study was conducted in two secondary hospitals in the Netherlands. Women with a singleton breech pregnancy with a gestation of 34 weeks or more were included. Exclusion criteria were multiple pregnancy, a positive family history and oligohydramnios. After informed consent an external cephalic version was offered. Postnatally, at an age of three months all newborns underwent ultrasonography of the hips by a radiologist. In case of abnormal results, the newborn was referred to an orthopaedist.

RESULTS: In a period of three years 342 pregnant women were included. In 80% an external cephalic version was conducted. Finally, 230 children were born in breech position. The percentage of caesarean section in children born in cephalic presentation after successful version was 4.5% versus 75% ($p = <0.0001$). In 16 children the diagnosis DDH was confirmed by an orthopedist; of these children, 15 were born in breech presentation ($p = 0.02$).

CONCLUSION: Our data suggest that successful external cephalic version significantly reduces the prevalence of developmental dysplasia of the hip, compared to newborns born in persisting breech presentation. Another benefit of the cephalic version is the lower caesarean section rate, that was confirmed in this study.

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401 Fetal hydrops, discharge diagnoses and outcomes: a retrospective cohort study

Amberly Davidson[1], Jessica Fischer[1], Vicki Dryfhout[1], William Polzin[1]

[1]TriHealth, Cincinnati, Ohio

OBJECTIVE: To determine the overall survival rate at discharge and discharge diagnoses of babies admitted to the neonatal intensive care unit (NICU) with a diagnosis of fetal hydrops.

STUDY DESIGN: A retrospective cohort study was conducted of babies admitted to the NICU with a diagnosis of fetal hydrops at Good Samaritan Hospital in Cincinnati, OH from 2001 to present. For these babies, we reviewed discharge diagnoses and outcomes to determine overall survival rate, defined as number babies living upon discharge to home or another treatment facility, and most common discharge diagnoses. Correlational analyses were used to determine associations between discharge diagnoses and survival.

RESULTS: Of the 39 babies admitted to the NICU with a diagnosis of fetal hydrops, average gestational age at delivery was 32.83 ± 4.10 weeks and birthweight was 2373.33 ± 936.07 grams. One hundred twenty-three discharge diagnoses were identified: the most common included respiratory distress syndrome (51.3%, n=20), polyhydramnios (25.6%, n=10), patent ductus arteriosus (25.6%, n=10), pleural effusion (25.6%, n=10), sepsis (20.5%, n=8) and transient neonatal thrombocytopenia (20.5%, n=8). Thirty-one percent (n=12) of babies survived versus neonatal death in 69% (n=27). Discharge diagnoses of premature rupture of membranes (PROM) ($r=.349$, $p<.05$), placental transfusion syndrome ($r=.349$, $p<.05$) and anemia of prematurity ($r=.332$, $p<.05$) were positively correlated with neonatal death while gestational age at delivery was negatively correlated with neonatal death ($r=.511$, $p<.05$).

CONCLUSION: Our study found a mortality rate of 69% which is comparable to findings from other studies. Particular diagnoses such as PROM, placental transfusion syndrome and anemia of prematurity as well as gestational age at delivery are associated with neonatal death.

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402 Maternal complications of nicardipine in treatment of preterm labor: a retrospective study of 819 patients

Bassam Haddad[1], Stéphanie Deis[2], Claudine Touboul[3], Christophe Masson[4], Gilles Kayem[4], Camille Olivier[5], Baha Sibai[6]

[1]University Paris 12 - Creteil, Creteil, France, [2]CHI Créteil, Obstetrics and Gynecology, Créteil, France, [3]CHI Creteil, Obstetrics and Gynecology, Creteil, France, [4]University Paris 12 - Creteil, Obstetrics and Gynecology, Creteil, France, [5]University Paris 12 - Creteil, Obstetrics and Gynecology, France, [6]University of Cincinnati, Cincinnati, Ohio

OBJECTIVE: There is concern about maternal safety of using calcium channel blocker in pregnancy with minimal data on the safety of nicardipine. The aim of this study is to examine its maternal side effects when it is used for the treatment of preterm labor.

STUDY DESIGN: From 2000 to 2006, all women admitted at high-risk pregnancy unit for preterm labor and treated with nicardipine were analyzed. Nicardipine treatment was administered intravenously at the dose of 1 mg/hour with increment of 1 mg/hour until a maximum dose of 4 mg/hour, or orally at 50 mg twice daily with a maximum dose of 150 mg. Salbutamol/Atosiban, were used as a second line treatment as needed. Maternal demographic, clinical and medical complications were analyzed. Univariate analysis (chi-square and Student-t tests, as appropriate) was performed when necessary.

RESULTS: During the study period, 819 consecutive women were treated with nicardipine for preterm labor. Gestational age at treatment onset was 29±3.2 weeks. Gestational age at delivery was 33.7±4.8 weeks. Rate of multiple pregnancies was 9.5% (n=157). Only 3 (0.3%) had pulmonary edema which responded to furosemide and oxygen administration. Dyspnea (n=35, 4.3%) was significantly increased in women with multiples compared to singleton pregnancy (9.5 vs. 3%, p=.001). Maximum loading dose and duration of nicardipine treatment, corticosteroid, or betamimetics were not associated with dyspnea. Three (2 twins and 1 singleton pregnancy) patients had pulmonary edema. All recovered under furosemide and oxygen therapy. Minor maternal side effects, summarized in Table, were frequent but mild and did not necessitate stopping the treatment.

CONCLUSION: This is the largest study that analyses safety of nicardipine treatment for preterm labor. Nicardipine is safe and rarely associated with major complications during pregnancy.

Maternal side effects

	#	%
Hypotension	302	36.9
Tachycardia	276	33.7
Headaches	48	5.9

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