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PRENATAL GLUCOCORTICOIDS: EFFECTS ON LUNG OF NEWBORN RATS EXPOSED TO HYPOXIA AND RECOVERED IN HYPEROXIA OR AIR.

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Aims: To examine the morphometric changes produced on lung of neonatal rats treated with prenatal administration of betamethasone or dexamethasone, and test the hypothesis if glucocorticoids would produce any difference when pups are exposed to hypoxia and its recovery with oxygen or air ambient.

Material and Methods: Dexamethasone, Bethametasone or equivalent saline solution was administered i.v. to gestant Wistar rats on 20 and 21 day of gestation. All rats delivered their pups within 48 hours after the last injection. The groups of rat pups were randomly assigned to either. At 4–8 hours of life newborn rats were exposed in sequential way during 2 hours in hypoxia, and recovered in > 95% oxygen or 21% oxygen. Lung and body weight were measured. For the morphometric study the lungs were fixed by intratracheal instilation of formol at a pressure of 20 cm.H2O. Quantitative morphometric assessment was done on coded slides with 400x magnification and a eye piece with a sample square grid pattern (model CPLW 1018, Zeiss Optical, Hannover Md).

GROUP	TREAT.	Wet lung W /Dry lung W	MORPHOMETRY Sa (cm²)	Sv (cm²)	Nv /mm³	rv (µ)
Air	SALINE	4,71±0.97	40.91±10.51	118.6±64	190±11.5	22.2±2.5
	DEX	5,14±1,4	59.77±21.58	309±21	85±12	54.1±12*
	BETA	5,19±1,1	60,08±6.68	338±47	110±10	51.9±4.1
Hypoxia	SALINE	4,92±1,09	75.69±10.0	410.6±33	130±2	50.0±1
	DEX	4,87±0.9	101.17±21.41	359±21	100±24*	54.8±4.4
	BETA	5,21±1,2	109,07±4.03	363±28	95±10*	55±1.9
Hypoxia + Hyperoxia	SALINE	5,82±0,54	120.92±32.41	466±32	206±30	43.14±5.3
	DEX	5,73±0,72	85.90±14.91	354.9±14	91±15*	56.2±2.5*
	BETA	5,28±0,89	73.75±13.62	304±27	57±17*	66±5.5*
Hypoxia + Air	SALINE	4,61±1,23	119.48±24.568	388±24	123±10	50.8±1.7
	DEX	5,56±0,9	96.7±10.58	346.4±1	103.6±9*	51.6±2.8
	BETA	4,99±0,89	98.24±2.03	324±12	74±7.8*	59.9±2.8*

Morphmetric changes are shown in table 1. Statystical Analyses: ANOVA test was performed followed by Bonferroni test. P< 0,05 was considered.

Result: Comparative wet lung weight/dry lung weight and morphometric study is show in table I DEX (dexamethasone) BETA (bethametasone) W.(weight), Sa (alveolar surface), SV (surface density of alveolar walls), Nv (numerical density of alveoli), rv (alveolar radius) * Significant differences with saline group.

Conclusion: Prenatal administration of dexametasone and bethametasone causes a reduction in alveolar number in newborn rats. Lungs of treated pups showed a longer alveoli radius , lower values of surface density of alveolar walls and lower numerical density of alveoli than the control group. Probably, prenatal glucocorticoids could produce a partial suppression of the formation of secondary septa and decreased final alveoli number.

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IMPACT OF CARDIOPULMONARY RESUSCITATION IN ELWB INFANTS. SURVIVAL AND SHORT-TERM OUTCOMES

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Background/Aims: We questioned whether extremely low birth weight (ELWB) infants who undergo cardiopulmonary resuscitation (CPR) at delivery room present poorer survival and short-term outcomes than those who do not.

Methods: Data from all inborn ELWB infants from 2000 through 2004 in a universitary hospital were analyzed. Infants with major birth defects, suspicion of genetic disease and those without proactive perinatal attitude were excluded. CPR was defined as administration of chest compressions and/or epinephrine at delivery room. Neonatal morbidity was compared between infants who underwent CPR and those who did not.

Results: 150 infants were included, with gestational ages between 23 and 27 weeks (mean 25.6 ± 1.2), and birth weights from 425 to 995 grams (745.2 ± 132). Delivery room CPR was givent to 32 infants (21.4%). No differences in perinatal characteristics were found except for significant lower pH and Apgar score, and higher SNAPPE score in infants who underwent CPR. Survival at discharge was similar (62.5 % vs 76.3% for those without CPR). Infants who received CPR needed more surfactant, higher oxygen inspired fraction and higher median airway pressure than infants who did not. During first week of life no differences were found between both groups in type and length of ventilatory support, haemodinamic instability, persistent duct or early onset sepsis. Air leaks and coagulopathy were more frequent in CPR-infants (p< 0.01). Head ultrasound was available for 96.6% infants. No statistical differences were found in any grade of intraventricular haemorrhage (IVH) (62.5% vs 52.5%), IVH III (31.2% vs 17.7%), periventricular hemorrhagic infarction (18.7% vs 11%), cystic periventricular leukomalacia (15.6% vs 11%), bronchopulmonary dysplasia (37.5% vs 39%), and necrotizing enterocolitis II-III (12.4% vs 16.9%).

Conclusion: This study does not support a poorer survival and significant increased morbidity during the neonatal period in ELWB infants who receive CPR.

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EXPOSURE TO MOVIE SMOKING AND SMOKING INITIATION AMONG US ADOLESCENTS

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Objective: To examine the association between exposure to movie smoking and smoking initiation in a nationally representative sample of young U.S. adolescents.

Design/Methods: We conducted a random digit-dial telephone survey of 6522 U.S. adolescents aged 10–14 years between June and October 2003. Using previously validated methods, we estimated exposure to movie smoking from 532 box-office hits released during the 5.5 years preceding the survey. The outcome was determined by asking the subjects whether or not they had ever tried smoking.

Results: The distribution of age, sex, household income and census region in the unweighted sample were almost identical to U.S. Census 2000 estimates, indicating a highly representative sample. The population prevalence of smoking initiation was 0.103 (an estimated 2.2 million U.S. adolescents). Adolescents were grouped by quartile of movie smoking exposure. Smoking prevalence was 0.023 for adolescents in quartile 1, 0.063 for quartile 2, 0.112 for quartile 3, and 0.218 for quartile 4 ($p < 0.001$), and the association did not differ significantly by race or region of the country. The multivariate analysis controlled for sociodemographics, friend/sibling/family smoking, school performance, sensation seeking, rebelliousness, self esteem, and parenting style. Compared with quartile 1, the adjusted odds for trying smoking was 1.7 (95% confidence interval 1.1, 2.7) for quartile 2, 1.8 (1.2, 2.9) quartile 3, and 2.6 (1.7, 4.1) for quartile 4. The covariate adjusted attributable fraction was 0.38 (0.20, 0.56), suggesting that exposure to movie smoking is the primary independent risk factor for smoking initiation in 836 000 (421 000, 1 215 000) U.S. adolescents in this age group.

Conclusions: This study implicates exposure to smoking in movies as a major risk factor for smoking initiation among U.S. adolescents, confirming previous work in smaller, regional samples.

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EFFECT OF TRIIODOTHYRONINE (T3) ON EXCITOTOXIC BRAIN DAMAGE OF NEWBORN MICE

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Background: PVL is a major cause of neurodevelopmental delay and lifelong handicaps in preterm infants. Until now effective or causal therapy is not available. Thyroid hormons play essential role in brain maturation and are known to be decreased after brain injuries in adults. Substitution of T3, the metabolically most active thyroid hormone, thus might mitigate brain injuries.

Hypotheses: Excitotoxic brain damage of newborn mice decreases thyroid hormon levels. Exogenous T3 administration restores thyroid hormon level and is neuroprotective.

Methods: We used a newborn mice model of PVL. We injected ibotenic acid (glutamate-analogue) into one hemisphere of five day old mice to create white and grey matter lesion. 3,3‘,5-Triiodo-L-thyronine (100µg) was injected intraperitoneally in a randomized fashion once at 1 hr or repeatedly at 1/24/48/72/96 hrs after injury. Animals were randomized into 4 groups: 1. hormon level (T3+T4) measurement without intervention 2. ibotenic acid intracranial 3. ibotenic acid intracranial + T3 once intraperitoneal 4. ibotenic acid + T3 repeatedly intraperitoneal. Study time-endpoints were at the time of setting the lesion and 24/120 hrs later. Study endpoints were histological assessement of the lesion size (mean length of rostro-caudal axis of the lesion) and/or hormonlevel measurement.

Results: Serum T3 levels decreased significantly while T4 significantly increased with advanced postnatal age. Induced brain damage did not influence serum T3/T4 levels 24/120 hrs after setting the lesion. There was no discernible change in serum T3/T4 levels 24/120 hrs after injection of T3. Neither a single nor repeated injection of T3 had significant effect on lesion size in grey/white matter assessed 24/120 hours after setting the lesion.

Summary: Excitotoxic brain damage does not significantly change serum T3 and T4 levels in newborn mice. Supplementary T3 injection at the dosage regimen used was neither neuroprotectiv nor increased regenerative capacities after excititoxic brain damage in newborn mice.

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RELATIONSHIP BETWEEN SERUM GHRELIN CONCENTRATION AND KIND OF FEEDING, AGE AND WEIGHT GAIN DURING THE FIRST YEAR OF LIFE

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Background: Ghrelin, a 28 amino-acid peptide mainly secreted by the stomach, displays different metabolic functions such as the regulation of food intake. Evidences about how early feeding mode could modify ghrelin concentrations are scanty. Aim: To evaluate ghrelin levels in breast-fed (BF) and formula-fed (FF) infants in the first year of life and the correlations between ghrelin and age, gender and weight gain.

Methods: We studied 100 healthy infants aged 0–12 months, recruited to our Department between June 2002 and June 2004, without gastrointestinal disease. Serum ghrelin concentrations have been determined at least 3 hours after feeding by RIA test (intra-assay 5%, inter-assay 7.6%) (Ghrelin (Total) RIA-3967, DRG, Germany). Weight gain was calculated as the ratio of the difference between infant weight at the day of the inclusion in the study and the birth weight and the age (days). Ethical Committee approved the study and parents gave written consent. Statistical analysis: Student t-test and multiple regression analysis; statistical significance set at p<0.05. Ghrelin values have been normalized with natural logarithm.

Results: Mean ghrelin value ± Standard Deviation in the study group was 3026.0 ± 1386.4 pg/ml. A significant difference in ghrelin concentration between BF and FF infants was observed in the first 4 months of life (p< 0.01): BF infants had lower plasma ghrelin concentration (1974.09 ± 620.17 pg/ml) than FF ones (2609.37 ± 738.48 pg/ml). Ghrelin concentration increased with the infant age and was correlated negatively with weight gain (r= -0.302) and positively with age (r= 0.412).

Conclusions: Our results support the hypothesis that plasma ghrelin concentrations are influenced by the type of feeding in the first 4 months of life. Further researches are needed to better clarify how this hormone could be involved in short-term and long-term energy balance in infancy.

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CORRELATION BETWEEN PLASMA LEPTIN LEVELS AND SKINFOLD THICKNESS IN FORMULA-FED INFANTS IN THE FIRST YEAR OF LIFE

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Background: Leptin is an adipocyte-secreted hormone and plays an important role in the regulation of energy homeostasis by the inhibition of food intake. Recently a positive correlation between leptin concentration and skinfold thickness has been found in prepubertal and pubertal girls. Evidences about the relation between leptin and subcutaneous fat mass in infancy are scanty.

Aim: To evaluate the relation between plasma leptin levels and skinfold thickness in the first year of life. Methods: We studied 98 AGA healthy infants aged 0–12 months, admitted to our Department between June 2002 and June 2004, without chronic or acute gastrointestinal disease. Serum leptin concentrations have been determined by RIA test (LEP-R44, Mediagnost, Reutlingen, Germany) at least 3 hours after feeding. Weight, length and cranial cincumference were measured and BMI was calculated. Tricipital and subscapolar skinfold thickness were performed by Holtain skinfold calliper LTD. The study protocol was approved by the local Ethical Committee and parents gave written consent. Statistical analysis: multiple regression analysis; statistical significance was set at p<0.05. Leptin values have been normalized with natural logarithm.

Results: In a multiple regression model adjusted for infant age and BMI we have observed a significant positive correlation between leptin and subscapolar skinfold thickness (beta=0.282; SE=0.095; p=0.005) in formula fed (FF) infants (n= 43), but not in breast-fed (BF) ones (n= 55; beta=-0.00809; SE=0.077; p=0.917).

Conclusions: Evidences in literature suggest that leptin mRNA expression is higher in subcutaneous than in visceral fat mass and that leptin is present in human milk. Our data show a positive correlation between leptin concentration and subscapolar skinfold thickness only in FF infants, who have a lower leptin concentration than BF infants. Our findings suggest that, even if leptin is secreted by subcutaneous fat mass, the source of leptin in BF infants could be mainly related to breast milk.