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INTELLIGENCE AND ACADEMIC ACHIEVEMENT IN SMALL CHILDREN: INTRAUTERINE GROWTH RETARDATION (IUGR) VERSUS CONTROLS Ilse (E.A.) Lakeman, Wouter J.de Waal, Froukje M.E.Slijper, Frank C.Verhulst. Dept of Child and Adolescent Psychiatry and dept of Endocrinology, Sophia Children's Hospital, Rotterdam.

64 children, born after intrauterine growth retardation (IUGR) and all with short stature (height SDS < -1.88), have been psychologically examined before starting growth hormone therapy (at T0). 32 matched control children (height below P10) have been tested as well. The tests concerned intelligence (WISC-RN) and school achievement (Groninger School Examination). Total Intelligence Quotients (TIQ), Verbal IQ and Performance IQ of the experimental group proved to be significantly lower ($p < 0.01$, $p < 0.05$, $p < 0.01$ respectively). No specific area of intellectual dysfunctioning could be detected in the IUGR-group; they achieved less in all areas. Regarding general school achievement, results showed no significant differences. However, IUGR-children proved to have more specific difficulties with arithmetic problem solving. Intelligence and school functioning correlated highly in the IUGR-group ($r = 0.70$, $p < 0.001$), but not in the control group. Auxological data, like duration of pregnancy and birthweight, differed significantly between both groups. Significant correlations were found between height SDS at T0 and intelligence (IUGR: $r = 0.34$, $p < 0.01$; control: $r = 0.41$, $p < 0.05$).

Summarizing, IUGR children obtain lower results on the WISC-RN, while they do not clearly achieve less at school. Being small is correlated with intellectual functioning. Birthlength and birthweight, surprisingly, are not.

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LONGITUDINAL STUDY OF WHOLE BONE MINERAL CONTENT (BMCT) AND BODY COMPOSITION IN VERY LOW BIRTHWEIGHT (VLBW) INFANTS. Alexandre Lapillonne, Bernard Salle, Francis Glorieux, Michèle Chambon, Olivier Claris, and Pierre Braillon. Department of Neonatology and Rheumatology, Hôpital Edouard Herriot, Lyon, France and Shriners Hospital, Montréal. Dual energy X Ray absorptiometry (DXA) is a non invasive, accurate and precise method for assessing BMCT and body composition in infants. 25 VLBW infants were studied by DXA at 3 months (theoretical term) and 6 months of age and were compared to normal values obtained in full term (FT) newborns. Mean birthweight \pm SD was 1185 ± 151 g and mean gestational age \pm SD was 30.6 ± 2 weeks. They were divided into 2 groups according to the diet: human milk (HM) + fortifier ($n = 10$), and LBW formula ($n = 15$). Results of scans are expressed in mean \pm SD.

Diet	HM + Fortifier		LBW Formula	
	3	6	3	6
Age (months)	3	6	3	6
Weight (g)	3580 \pm 466	5991 \pm 603	3179 \pm 565	5695 \pm 750
BMCT (g of HAP)	54.6 \pm 22.9	175.6 \pm 40.6	35.8 \pm 33.8	163.9 \pm 34.2
Fat (g)	699 \pm 248	2108 \pm 522	572 \pm 295	1895 \pm 616
% fat	19.1 \pm 5.5	34.2 \pm 6.6	17.1 \pm 4.8	32.2 \pm 6.4
Lean (g)	2864 \pm 379	3835 \pm 411	2588 \pm 379	3714 \pm 326

(There was no significant difference between the two diet groups according to age) Conclusions: (1) In VLBW infants, at 3 months of age, BMCT was significantly lower than in FT newborns at birth (66 g) and thus demonstrated osteopenia. On the contrary at 6 months such a difference was not found anymore. (2) Body composition at 3 months was not significantly different of that of FT newborns at birth; but at 6 months fat content was elevated. (3) Diet did not influence body composition and BMCT in VLBW infants as measured at 3 and 6 months.

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DIFFICULTIES PAEDIATRICIANS MEET IN TELLING DIAGNOSES TO CHILDREN

Bob F. Last, Anneke Destrée-Vonk, Francis W. Schröder, Nicole A. Hermans, Annemarie M. Meyer. Paediatric Psychosocial Department, Academic Medical Center, Meibergdreef 9, 1105 AZ Amsterdam.

Research question

Recent empiric research shows the importance of open information in telling diagnoses to children. How well are paediatricians prepared to this part of their job? What difficulties do they experience?

Methods

34 paediatricians in training and 6 paediatricians were submitted to a semi-structured interview exploring their routines and difficulties in telling diagnoses. Relevant variables were: the age of the child, the severity of the disease, years of work-experience and their opinion about their abilities to communicate diagnoses to children. The data were quantitatively analyzed using a chi-square test for differences between the variables.

Results

87% of the respondents experienced difficulties in telling diagnoses to the child. Problem sources are: uncertainty about the child's level of understanding, the child's emotional reactions (a.o. a non-responsive attitude), severity of the diagnosis and parental acceptance of the diagnosis. No correlation was found between experienced difficulties and the years of work-experience of the respondents. A significant negative correlation was found between the experienced difficulties and the variable 'having own children' indicating that being a parent facilitates the doctor-child relationship.

84% of the respondents expressed the need of extra education in coping with the question what and how to tell the child about his/her disease?

Conclusion

The data of this research show that paediatricians need more education in children's conceptualization of disease and treatment. Special attention to telling the diagnosis in educational programs is recommended.

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FLOW DEPENDENCE OF RESPIRATORY MECHANICS IN MECHANICALLY VENTILATED NEONATES. Laurent Storme, Yvon Riou, Régis Logier, Patrick Truffert, Serge Ganga, Sylvaine Rousseau, Pierre Lequien. Service de Médecine Néonatale Hôpital Calmette. CHRU de LILLE. France.

To investigate the effects of inspiratory flow and/or inspiratory time on the different components of respiratory mechanics, 15 mechanically ventilated neonates for respiratory failure, were studied (gestational age: 26 to 40 weeks; birth weight: 750 to 5900 gm). All neonates were ventilated during volume controlled ventilation with a Servo 900C Siemens ventilator. Dynamic and static elasticity ($E_{dyn,rs}$ and $E_{st,rs}$), airway and tissue resistance (R_{aw} and $R_{visc,rs}$) and intrinsic positive-end-expiratory pressure (PEEPi) were calculated by using interrupter technique (1) at various inspiratory times (20, 25, 33, 50 and 67 per cent of the respiratory cycle), without changing of the tidal volume and the respiratory rate. R_{aw} increased whereas $R_{visc,rs}$ decreased with increasing flow, provoking decreasing of total respiratory system resistance ($R_{tot,rs} = R_{aw} + R_{visc,rs}$). $R_{visc,rs}$ represented an important part of $R_{tot,rs}$ (40 - 70% as a function of flow). $E_{st,rs}$ remained constant but $E_{dyn,rs}$ increased with increasing flow. Time constant of the respiratory system decreased with decreasing inspiratory time below 0.65 seconds. It could traduct an adaptation of respiratory mechanics with inspiratory time variations to maintain tidal volume constant. These results demonstrate that the respiratory mechanics are flow and/or time dependent in mechanically ventilated newborn infants. This dependence is mainly related to viscoelastic properties of the respiratory system and should be considered to optimize ventilator settings. (1) Similowski T et al. J.Appl.Physiol. 1989; 67: 2219-2229.

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PROTON MR SPECTROSCOPY AND CBF TO PREDICT OUTCOME AFTER PERINATAL ASPHYXIA

Helle Leth, Peter B. Toft, Ole Pryds, Birgit Peitersen, Hans Lou, Ole Henriksen. Department of Paediatrics and The Danish Research Centre of Magnetic Resonance, University Hospital Hvidovre, Denmark.

Asphyxia in the term infant is the most common cause of poor perinatal outcome. The aim of our study was to identify early, severe brain damage after perinatal asphyxia by demonstrating lactate accumulation in the brain with proton-MR-spectroscopy (H-MRS) and cerebral hyperperfusion by xenon-133 clearance. We included 18 mature infants, appropriate for gestational age, with a mean umbilical pH of 6.95 (6.73-7.19) and an Apgar score at five minutes ranging from 1-10 (mean 4.5). Cerebral blood flow (CBF) was determined daily in the first three days after birth and an early H-MRS was carried out at day 0-7 (mean 3.3). Results at five month of age was that four infants had died within the first week, three showed moderate to severe neurological deficits and eleven infants appeared to be progressing normally at this time. Lactate accumulation in the brain ($p = 0.0003$) and high CBF ($p = 0.02$) were highly associated with severe outcome, and infants who survived with handicap had prolonged lactate accumulation in the brain and persistently low NAA/Cho (N-acetyl-aspartate/choline, $p = 0.009$) as compared to normal infants. In conclusion, early H-MRS and CBF are highly predictive of poor outcome in severely asphyxiated infants.

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PROSPECTIVE EVALUATION OF THE CARBOHYDRATE AND FAT ABSORPTION IN NEONATES FOLLOWING MAJOR AND MINOR RESECTIONS.

Gineke Liefwaard, Erik Heineman, Jan C. Molenaar and Dick Tibboel. Dept. of Pediatric Surgery, Sophia Children's Hospital, Rotterdam.

Prospective data of the absorptive capacity of the bowel following resections in human newborns are lacking. For this reason 23 neonates (no CF) who underwent a bowel resection for necrotising enterocolitis, intestinal atresia etc. were studied. The mean remaining bowel length related to gestational age was 72.7% (24-100%). In eight patients less than 50% of the original small bowel length remained (short bowel syndrome=SBS). At 2,4 and 12 weeks after the initial operation, and at the age of 3 and 6 months the carbohydrate content (mg glucose/g faeces), total fatty acids content (mg/kg faeces) and the medium-chain triglycerides/long-chain triglycerides (LCT) ratio of the enterostomy fluid or faeces was measured and compared with the oral intake. Results:

- Carbohydrate absorption is almost complete in neonates following minor resections with an average of 97.8% (95.9-99.3%).
- Carbohydrate malabsorption is only temporary present 2 (67.0% range 34.8-88.9%) and 4 (86.5% range 69.6-98.7%) weeks after the initial operation in neonates with SBS.
- Fat absorption in neonates following minor resections is normal with an average of 89.6% (78.7-94.5%).
- Fat malabsorption is present 4 (55.7% range 6.1-84.0%) and 12 (51.9% range 0-95.0%) weeks after the initial operation in neonates with SBS, especially related to the absorption of LCT.