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Effect of diet on the fatty acid composition in human milk.

The proportion of saturated fatty acids of human milk is in Finland higher than in many other countries (Timonen et al.: *Pediat. Res.* 1977;11:1028), likely reflecting the high consumption of saturated fats. The purpose of the present study was to find out whether a well-adaptable change in the dietary fats can influence the fatty acid composition of human milk. Eight lactating mothers were on the third week after delivery on the usual Finnish home diet (P/S ratio <0,2), on the fourth week on a modified diet (P/S ratio >1,0), and on the fifth week again on the low P/S ratio diet. The fatty acid composition of the milk samples was determined by gas chromatography. - The change from a low to high P/S ratio diet was reflected in the fatty acid composition of human milk within 12 hours. Among the major fatty acids the proportions of oleic (C18:1) and linoleic (C18:2) acids increased ($p < 0,05$ and $< 0,005$, respectively), and those of myristic (C14:0), palmitic (C16:0), and stearic (C18:0) acids decreased ($p < 0,01$, $< 0,05$ and $< 0,05$, respectively). After the return to low P/S ratio diet the opposite changes were observed. - Our results show that the low percentage of unsaturated and the high percentage of saturated fatty acids in human milk can be changed by an easily realizable alteration of the mother's diet.

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Influence of different milks on the plasma aminogram of normal term newborn infants.

Of 95 term normal newborns 20 received breast feeding (group I). The 75 others were divided in 3 groups receiving different nearly isocaloric cow's milk formulas. 20 had a formula providing 4.4g protein/100Kcal with 3.6g (82%) casein (group II); 29 received 2.6g protein/100Kcal with 1.3g (50%) casein (group III); 26 received 2.16g protein/100Kcal with 0.86g (40%) casein (group IV). Daily caloric intake rose from 20Kcal/kg on day 1 to 100Kcal/kg on day 6 for groups II, III & IV. Growth rate was similar in the 4 groups. Blood for determination of plasma amino acid concentration by column chromatography was withdrawn on day 7 at 8 a.m. at least 3h after the first feed. The results were analysed using computerized determining factors. Significant differences ($P < 0,01$, Student's test) were found between the 4 groups allowing to discriminate them according to the feeding regimen. Compared with group I the mean values for valine, phenylalanine, methionine, lysine, alanine and tyrosine were increased in group II; in group III only threonine was high; in group IV cystine and threonine were elevated. Values beneath the lower range of group I were found for taurine in 3 infants of group III and for leucine and arginine in 3 infants of group IV. These results raise again the question of the optimal amount and the quality of protein to be given to artificially-fed infants. The use of computerized discriminating factors provide a sensitive method to study the effect of protein intake on the plasma-aminogram.

63 The effect of unheated human milk on the intestinal flora of preterm infants. L.A. Gothefors (spon. by Pamela A. Davies) Dept. of Paediatrics & Neonatal Medicine, Hammersmith Hospital, London.

There is a significant difference in the prevalence of intestinal infections between breast and bottle fed infants. Human milk may also have a protective function against neonatal septicemia/meningitis and necrotizing enterocolitis, both conditions in which enteric organisms may be of importance in pathogenesis. These effects have been ascribed to antimicrobial factors in the milk, many of which are destroyed by heat, though pasteurization is less damaging than boiling.

The effects of feeding fresh (sometimes frozen, never heated) human milk, pasteurized human milk and a modified dried cow's milk on the intestinal flora of immature, often very ill, infants in a neonatal intensive care unit has been studied. Twenty babies were investigated with median gestational age 32 weeks (range 28-37) and birth weight 1430 g (range 760-1920). Fourteen of the 20 had one or more antibiotic courses during the study period of 5 weeks.

Unlike healthy term infants, the flora did not become stabilized for several weeks after birth. The numbers of infants colonized with *E. coli*, *Klebsiella* or *Enterobacter* did not differ in those fed fresh human milk or a modified dried cow's milk. The only obvious effects of human milk (fresh or pasteurized) were that the number of infants colonized with *Str. faecalis* and clostridia were reduced, and bifidobacteria were somewhat more common. The reduction in numbers of enterobacteria was considerably less than that expected in healthy mature breast fed babies.

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Peripheral circulation in the newborn: Interaction of peripheral blood flow, blood pressure, blood volume, and blood viscosity.

Peripheral blood flow and systolic blood pressure (strain gauge plethysmograph), blood volume (Evans blue), and whole blood viscosity (cone-plate viscometer) have been measured in 66 sick premature and full-term infants 6 to 144 hours of age. Blood flow and blood volume were moderately decreased in the infants with respiratory distress. Highly significant ($P < 0,001$) correlations were found between blood flow and blood volume ($r = 0,77$), blood pressure and blood volume ($r = 0,50$), peripheral resistance and blood volume ($r = -0,44$), blood flow and pressure ($r = 0,50$), blood flow and peripheral resistance ($r = -0,67$), peripheral resistance and blood viscosity ($r = 0,45$), and blood viscosity and hematocrit ($r = 0,86$). There was no correlation between peripheral flow and blood viscosity. However, at given blood volume peripheral blood flow decreased with increasing blood viscosity. These results indicate that in newborn infants peripheral blood flow, blood pressure and peripheral resistance are influenced by blood volume, but also depend on blood viscosity.

65 P. HURME*, P. KOSKINEN*, P. KORPELA*, K. ANTILA* and I. VÄLIMÄKI, Dept of Paediatrics and Cardiorespiratory Research Unit, Univ of Turku, Turku, Finland; Computer estimation of heart-rate variation in juvenile diabetes. Quantitative test for disturbed cardiac control?

A considerable reduction of heart-rate variation (HRV) has been described in adult diabetic patients with peripheral neuropathy¹, indicating severe autonomic denervation of the heart.

We studied 13 diabetic subjects (9 boys, 4 girls, age 11.5 range 7-15 yrs) and 20 normal children (10 boys, 10 girls, age 12, range 7-15 yrs) by our computerized heart-rate monitoring system² to test whether the HRV would be affected early in juvenile diabetes. The duration of the disease was 3.5 yrs (range 1/2 - 14 yrs).

In the younger subjects (7-11 yrs) the diabetic children had a lower relative HRV (9.1%) than the normals (12.8%). In the older group (12-15 yrs) no difference was found. No correlation existed between the HRV and duration of the disease. Thus the nervous control of the heart may be affected earlier than expected but the mechanism is obscure.

1. Wheeler, T. & Watkins, P. J.: *Brit. Med. J.* 4:584, 1973.

2. Kero, P.: *Acta Paed. Scand. suppl* 250, 1974.

66 Y. DESSART*, G. ANNAT*, M. VINCENT*, J. SASSARD*, C.A. BIZOLLON*, R. FRANCOIS, J.F. CIER*. Service de Pédiatrie, Hôpital E. Herriot et Laboratoire de Physiologie, Faculté de Médecine et de Pharmacie, LYON - France.

The evolution of Plasma Renin Activity, Aldosterone and Dopamine β hydroxylase activity from infancy to puberty.

Plasma Renin Activity (PRA), aldosterone (PA) and dopamine β hydroxylase activity (DBH) were simultaneously measured in 125 normal children, aged from one day to 15 years maintained in carefully controlled conditions. DBH increased with age from one day to 5 years; after this age DBH reached normal adult values ($15.5 \text{ IU} \pm 4.7 \text{ SEM}$). Before one year of age, PRA and PA were extremely high and widely distributed (PRA = $388 \text{ ng/1mn} \pm 36.6 \text{ SEM}$; PA = $521 \text{ pg/ml} \pm 59.1 \text{ SEM}$). After this age, PRA and PA decreased simultaneously to reach normal adult values after 9 years of age (PRA = $46.1 \text{ ng/1mn} \pm 9.3 \text{ SEM}$; PA = $45.8 \text{ pg/ml} \pm 7.9 \text{ SEM}$). A correlation was found between the values of DBH and PRA ($r = 0.404 \text{ p} < 0,001$) and of PRA and PA ($r = 0.732 \text{ p} < 0,001$). In children, aged more than one year, the evolution of DBH, PRA and PA was related to the age (for DBH $r = 0.478$, $\text{p} < 0,001$; for PRA $r = 0.742$, $\text{p} < 0,001$; for PA $r = 0.654$, $\text{p} < 0,001$).

These results support the hypothesis that, in young children, the immaturity of the autonomic nervous system could be counterbalanced by an enhanced activity of the renin-angiotensin-aldosterone axis.