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RESPONSE OF BONE AND KIDNEY TO PARATHYROIDEA EXTRACT(PTE)IN CHILDREN RECEIVING ANTICONVULSANT DRUGS

Antiepileptic drugs (a.d.) may interfere with the action of PTH on bone in vitro. The aim of the present study was to investigate the in vivo response of bone and kidney to PTE in epileptic children on long-term treatment with a.d. In six epileptic patients (P) with normal serum iPTH levels and two boys with untreated idiopathic hypoparathyroidism (H) a)urinary total hydroxyproline (OH-P) and serum calcium (Sca)before and during prolonged PTE administration and b) urinary (UcAMP) and plasma cyclic AMP (PcAMP) and the percent tubular reabsorption of phosphate (TRP) before and after PTE infusion over 15 min. were measured.
a) Maximal Sca increase was 2.3-6.4 mg/dl in P and 4.9-6.1 mg/dl in H. The percental rise of OH-P was 105-229 in P and 100-121 in H. b) UcAMP increased 17-89 fold in P and 92-169 fold in H, PcAMP increased 13-28 fold in P and 15-23 fold in H. TRP fell 3.5-8.1 % in P and 24-34% in H (normal: 10-30 %) after PTE infusion.
Conclusion: a) The normal increase of Sca and OH-P indicates that inhibition of PTH-mediated resorption of ca from bone is not a significant factor in anticonvulsant related disturbance of ca metabolism. b) The dissociation between cAMP excretion (normal) and phosphate (decreased) resembles type II pseudohypoparathyroidism.

30 Influence of thyroxine and parathyroid hormone on longitudinal and periosteal growth

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Congenital hypothyroidism is known to be associated with abnormal geometry of tubular bones.Tubular bones tend to be short and plump.It is generally assumed that this is due to the inhibition of longitudinal growth in the presence of undiminished periosteal growth in hypothyroidism.To prove this hypothesis, longitudinal periosteal growth was measured in experimental hypothyroidism and hyperthyroidism in rats.In such experimental animals changes of bone geometry similar to humans have been found.
Methods: loo gmale Wistar rats with euthyroidism (Eu) (sham-op,solvent injection), hypothyroidism (TX) (surgical TX) or hyperthyroidism (HT) (o,o5 mg T4/d, i.p.) were investigated both in parathyroid intact (PT-autotransplantation) or after PTX.Animals received repetitive tetracycline labels.Bone geometry, longitudinal and periosteal growth rate were measured in undecalcified sections.
Results: Independent of parathyroid function, hyperthyroidism decreased periosteal growth and hypothyroidism decreased both longitudinal and periosteal growth significantly.PTX has an independent adverse effect on periosteal and longitudinal growth of the tibia.
Conclusion: Plump tubular bones in hypothyroidism cannot be the result of unimpaired periosteal apposition in the presence of decreased longitudinal growth rate.The above findings are compatible with the notion of diminished funnelling of metaphyseal cortex in hypothyroidism.

31 S. SBYRAKIS, L. KIPOUROU, K. DEMOPOULOS, C. VRETOS and P. LAPATSANIS. Institute of Child Health, Athens and Paediatric Unit of Ioannina University, Ioannina, Greece. Sodium Cellulose Phosphate in the Treatment of Hypercalciuric Children with Renal Stones.

In the present study seven children, aged 5-16 years, who were admitted to the paediatric unit for nephorlithiasis had the 24 hour urinary calcium (UCa), Phosphorus (UP) and magnesium (UMg) excretions 8.2±2.5, 40.9±16.7 and 3.8±2.14 mg/kg, respectively. The UCa to urinary creatinine (UCr) concentration ratio (UCa/UCr), the UP/UCr and the UMg/UCr were 0.30 1.39 and 0.15 respectively. The values of serum Ca, P and Mg were 9.3±0.89, 4.6±0.27 and 2.28±0.56 mg/dl, respectively. After the oral administration of 10g sodium cellulose phosphate per day, the 24 hour urinary Ca, P and Mg excretions were 4.16±4.0, 24.9±7.5 and 2.16±2.0 mg/kg respectively. During the long term treatment the mean values of serum Ca, P and Mg were 9.8, 4.4 and 1.9 mg/dl, respectively. The patients did not have any new attacks of renal colic and no new renal stones were seen radiologically. All patients developed normally and no clinical and radiological findings of rickets were detected during the course of treatment lasting 6 months to 9 years.

32 L. David, B. Salle, P. Varenne, H. Renaud, and R. François. Neonatal unit and department of pediatrics Hopital Edouard Herriot, Lyon, France. Evolution of serum calcium (Ca), phosphorus (P), magnesium (Mg), immunoreactive parathyroid hormone (iPTH) and calcitonin (iCT) levels in infants of diabetic mother (IDM) from 2 hours to 5 days of life.

In order to study the pathogenesis of hypocalcemia in IDM, determinations of serum levels of Ca, P, Mg, iPTH and iCT were performed in 15 IDM (gestational age : 36.7 ± 1.3 weeks ; birth weight : 3755 ± 617 g) at 2, 24, 48 h and 5 days. Infants were infused with glucose and fed with human milk. Serum Ca (mg/dl, mean ± SD) decreased from 2 (8.6 ± 0.6) to 24 h (7.1 ± 1.2, $p < 0.001$) and remained low at 48 h and 5 days (7.5 ± 0.5). Serum Mg (mg/dl ; mean ± SD) decreased from 2 h (1.8 ± 0.2) to 24 h (1.6 ± 0.2, $p < 0.02$) and returned to normal levels at 5 days. There was no significant change in serum P (6.3 ± 1.7 and 7.0 ± 1.2 mg/dl at 2 h and 5 days). Serum iPTH - undectable (< 25 µlEq/ml) in 6 IDM and ranging from 27 to 160 µlEq/ml in 7 at 2 h (normal range in children : < 100) - showed a sustained increase until 5 days (184 ± 119 µlEq/ml, $p < 0.01$). Serum iCT was undectable (< 150 pg/ml) in 9 IDM and ranged from 150 to 180 pg/ml in 4 at 2 h ; it showed a marked increase at 24 h (536 ± 208 pg/ml, $p < 0.001$) and by 5 days returned to mostly undectable values. Our findings indicate that hypocalcemia of IDM takes place during the first day of life ; in most IDM there is evidence for parathyroid responsiveness ; hypercalcitoninemia is present during the first 48 h. These data suggest that in IDM 1) Ca metabolism is similar to that of other premature infants and 2) hypocalcemia is mostly the consequence of the abrupt interruption of the large maternal Ca supply.

33 IMPORTANCE OF FORMULA Ca/Pi RATIO ON CALCIUM BALANCE IN THE LOW BIRTHWEIGHT INFANTS DURING THE FIRST THREE DAYS OF LIFE.

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Twenty four healthy low birthweight infants were placed into three groups according to the formula fed. Group 1(10 infants)received a formula with a Ca/Pi ratio of 2.4 .Group 2 (9 infants) a Ca/Pi ratio of 1.6 and Croup 2s the same formula as Group 2 but supplemented with calcium lactate giving off a Ca/Pi ratio of 4.2 . All ratios were obtained after 78 determinations of formula feedings. Pi content in Group 1 formula was significantly lower ($p < 0.01$) than in Group 2 and 2s. No differences (F) were detected in the neonatal status.
Calcium retention (mg/Kg/d) was significantly higher ($p < 0.05$) in Group 1 than in Group 2 (50.8±15.9 versus 39.3±12.8) but lower than in Group 2s (107.7±25.6 ; $p < 0.001$).Magnesium retention was 5.6±2.3; 4.6±1.8 and 5.6±2.1 respectively with no significant differences. Pi retention was significantly higher ($p < 0.01$) in Group 2 (39.2±5.2) than in both Group 1 (31.4±5.6) and Group 2s (31.9±3.6). Calcium retention correlates ($r = 0.79$ $p < 0.001$) with the real Ca/Pi ratio. Hypocalcemia appeared only in two infants from Group 2. According to these data, higher Ca/Pi ratios increase calcium and decrease Pi retention.

34 L. SANN, F. BIENVENU, C. LAHET, J. BIENVENU, M. BETHENOD. Hopital Debrousse, Lyon, France.

Study of the composition of milk of the full term infant's mother (FTIM) and of the preterm infant's mother (PTIM).

Feeding the preterm neonates with breast milk is still controversial. However the composition of milk of the PTIM is not known. Breast milk of FTIM and PTIM collected by and pasteurized in a milk bank was analysed during the first week of lactation and the first month of lactation for sodium (Na), potassium (K), proteines (PT), calcium (Ca), phosphorus (P), copper (Cu), zinc (Zn), lactose and lipid concentrations. 39 milk samples of PTIM were compared to 47 milk samples of FTIM. During the first week of lactation mean concentrations in milk of FTIM and PTIM were similar for calories: 520 vs 518 cal.1, Na=27 vs 31 mEq/l, K=17 vs 17 mEq/l, PT=23 vs 23 g/l, Ca=240 vs 250 mg/l, P=97 vs 102 mg/l, Zn=4376 vs 4474 µg/l respectively but different for Cu=544 ± 247 (± 1 SD) in milk of FTIM vs 731 ± 284 µg/l in milk of PTIM (p 0.05). During the last three weeks of the first month of lactation the concentrations were also identical in milk of FTIM and PTIM.

These data show that the energetic and mineral composition of milk of PTIM is almost similar to the composition of milk of FTIM. The concentrations is colostral and transitional milk may be more adapted than mature milk to some requirements of preterm infants.