91 DEMONSTRATION AND ISOLATION OF THE ENZYME PRECURSOR OF ACTIVE SUCRASE IN RABBIT AND HUMAN SMALL INTESTINE

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By immunofluorescence microscopy using specific antibody to active rabbit or human sucrase, a catalytically inactive sucrase antigen was discovered on enterocytes of young rabbits still lacking sucrase. This antigen was also located in the mucosal crypts /which are devoid of sucrase/ of adult rabbits and of normal humans. The catalytically inactive antigens of both species were isolated by immunosorbents and were compared with their corresponding active sucraes. There were structural similarities between active and inactive proteins. Active sucrase succeeded the inactive antigen in the maturing rabbit as well as during cell migration from crypts to villi in mature rabbit and man. It was concluded that the inactive antigens were the enzyme precursors. In six patients with sucrase-isomaltase deficiency an inactive enzyme antigen was demonstrated. Abnormal persistence of sucrase precursor due to a fault in the transition of precursor to sucrase could be the underlying defect in some of the patients.

92 A CHEMICAL STUDY ON HUMAN CEREBELLAR DEVELOPMENT. II. PHOSPHOGLYCERIDE FATTY ACIDS

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A group of newborn infants born during the second half of gestation were studied for the fatty acid composition of EPG and CPG in the cerebellar tissue. The fatty acid pattern of EPG and CPG were analyzed by GLC and the results compared with those found in cerebrum and with other parameters previously studied in cerebellum /total lipid P and gangliosides/. They included the ratios n3/n6, 22:4 n6/22:5n6, 22:4n6+22:5n6/20:4n6 and 18:0/18:1n9. The overall changes were slighter than those found in the cerebral tissue but the parabolic profile of some parameters was clearer in cerebellum than in cerebrum. As the descending part of the curve was longer in cerebellar tissue than in cerebrum, the differences between cases with quite extreme gestational ages were smaller in cerebellum than in cerebrum. The selection criterion of the cases and the storage of the material were the same described in other papers.

93 FEEDBACK INHIBITORS ON ERYTHROPOIESIS

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The RBC level is maintained at a very constant level, regulated through stimulating /ESF/ and inhibiting factors. The regulatory effect of RBC and compounds from RBC has been tested on ESF stimulated exhypoxic polycythemic mice, using the Fe^{59} incorporation into RBC as parameter. Both intact and hemolyzed RBC were able to inhibit erythropoiesis. The inhibiting factor did not contain heme. Elemental iron did not reduce the Fe^{59} uptake. On the contrary, Fe^{59} ions rather stimulated ESF induced erythropoiesis, probably due to increased amounts of available iron. Increasing amounts of immature RBC in the testmaterial, reduced the inhibitory effect. An inhibiting factor was liberated into the incubation medium when RBC were incubated for 20 hrs. Mature RBC are able to produce a substance different from heme, with a negative feedback on erythropoiesis. In compensated hemolytic anemias having no elevated ESF levels, the increased erythropoiesis could be explained by hemolysis of the RBC before full maturation.

PARATHYROID FUNCTION IN PREMATURE INFANTS

94 /P.I./ OF VERY LOW BIRTH WEIGHT

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Neonatal hypocalcemia is common in P.I. It is not clear whether it results from transient hypoparathyroidism on unresponsiveness to parathyroid hormone /PTH/. Serum levels of calcium /Ca/, phosphorus /P/, magnesium /Mg/ and immunoreactive PTH were determined in 55 P.I.-mean gestational age /GA/: 34,5 weeks; mean weight: 1,820kg-during the first 48h of life /times: 0-2h; 10-14h; 22-26h; 34-38h; 44-48h/. Mean Ca decreased from 8,74±0,92/SD/ at time 0-2 to 7,80±0,93 mg/looml at time 22-26 and then remained stable. There was no significant change in mean P and Mg. Detectable values of PTH were found in all but 2 infants at time 0-2 with mean value of 50±38 uEq/ml /normal range for children an adults: <50 uEq/ml with 90 % being detectable/. Then PTH levels rised steadily reaching the high mean value of 202±105 uEq/ml at time 44-48. There was no correlation between PTH levels and G.A. at any time and several infants with very low presented with elevated PTH levels at time 0-2 which increased further later. Conclusion: Normal parathyroid responsiveness is present at birth in P.I. Therefore in P.I. neonatal hypocalcemia is not the result of transient hypoparathyroidism; other aspects of its pathogenesis will be discussed.

95 POST-TRANSFUSION ANTI-HLA ALLOIMMUNISATION IN ACUTE LEUKEMIA

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Patients with acute leukemia /AML and ALL/ who receive multiple transfusions of whole blood, platelets, or granulocytes, may develop anti-HLA immunisation in spite of chemotherapy. The frequency of HLA-alloimmunisation was studied in 10 children with ALL and in 3 with AML. HLA antibodies with multiple specificity were detected in 7 with ALL /70%/, and in all 3 with AML. The presence of these antibodies was associated with febrile transfusion reactions, and with immediate destruction of platelets or granulocytes. Selection of HLA compatible donors eliminated these reactions and permitted substitute therapy until a remission occurred. Therefore, as soon as anti-HLA immunisation is present, HLA compatible transfusions must be given.

96 ADENOSINE DEAMINASE /ADA/ AND PURINE METABOLISM IN HUMAN LYMPHOCYTES

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Purine metabolism was studied in lymphocytes by assaying adenine- and hypoxanthine phosphoribosyltransferases /APRT and HPRT/, ADA and adenosine kinase /AK/. Also, the incorporation of 14C-adenine, -hypoxanthine and -adenosine into purine compounds was measured in intact cells. The activities of APRT and HPRT were low and correlated with minimal uptake of the 14C-bases. Adenosine was taken up more avidly, followed by conversion into adenine nucleotides by AK and into inosine by ADA. The predominant pathway was usually deamination, shown by 1.3-2.3 times higher ADA than AK activity, and by 1.3-3.4 times higher isotope flow through the pathway. Thus, intracellular adenosine is mainly degraded rather than reutilised, and deficiency of ADA would lead to elevated intracellular levels. Since adenosine is known to be toxic to a number of mammalian cells, this is a possible mechanism for the disturbed lymphocyte function in severe combined immunodeficiency, in which ADA deficiency has been established.