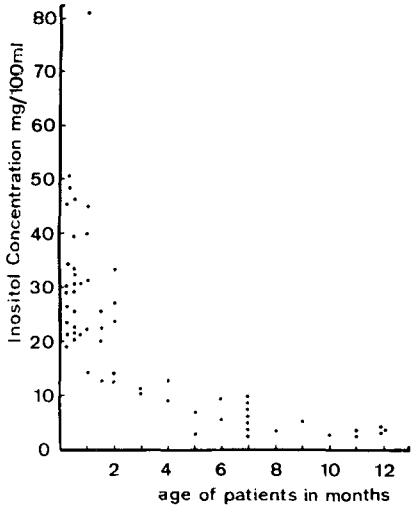
Highly Elevated Content of Free Myo-Inositol in the Cerebrospinal Fluid of Neonates

In the course of an investigation on the concentration of free myo-inositol in cerebrospinal fluid (CSF) specimens of more than 500 patients admitted to our hospital, surprisingly high values were found in the newborns. In this communication, the results of inositol determinations are reported in CSF of 60 babies, their ages ranging from newborn to 12 months. Of these patients, 11 showed CNS disease (convulsions, hydrocephalus, epilepsia, meningitis). The others suffered from respiratory distress, congenital heart disease, newborn jaundice, electrolyte imbalance, diseases of the gastrointestinal and urinary tract or from some other less frequent conditions.

The method used for inositol quantitation was an enzymatic procedure described by WEISSBACH[1]. As shown in the Figure, the highest inositol content in CSF of neonates was 81 mg/100 ml, the lowest 18, as compared with a published normal range in the adult of 2.0–3.4 mg/100 ml[2]. A gradual decrease in concentration to normal levels was observed at the age of approximately 12 months. No obvious relationship was apparent between inositol content and the disease state of the patients. Moreover, there seemed to be no difference between premature babies and those born at term. Only the age of the patients appeared to correlate with the inositol concentration in CSF.



Inositol content in CSF of 60 patients.

The significance of the findings reported here is not clear. PFAFFENBERGER et al.[3], in their studies on human urinary polyols, found a high excretion of inositol in the neonates, amounting to an average of 2.2 mg/mg creatinine as compared to 0.033 mg/mg creatinine in the adult. These authors relate this finding to the continuing synthesis of central nervous system tissue during the first days of life. Since myo-inositol is largely bound to phospholipids, the concentration of its free form in CSF could reflect metabolic activity of the mono- and polyphosphatidyl inositol during the development of the central nervous system, in particular myelinization. In serum of some of the neonates investigated, the inositol levels were found to be only slightly elevated, indicating a fast renal clearance. An extensive survey of inositol content in human body fluids is in progress in order to shed more light on the significance of the elevated inositol concentration in CSF during the first year of life.

Summary. Free myo-inositol in cerebrospinal fluid was determined in 60 babies aged from newborn to 12 months. In the neonates, a high inositol concentration was found (18–81 mg/100 ml). With increasing age, the values gradually decreased. The finding is discussed in relation to the maturation processes in central nervous tissue.

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The Activity of Newcastle Disease Virus-Envelope Proteins after Treatment with Detergents

It is known that treatment of Newcastle disease virus (NDV) with lipid solvents, anionic or nonionic detergents disrupts the virus into separated or aggregated subunits. Since the influence of various detergents on the protein-phospholipid linkages differ[1], we studied the activity of the main envelope proteins after disruption with lipid solvents, anionic, and nonionic detergents to explain the importance of protein-phospholipid linkages for this activity.

Materials and methods. The avirulent strain 'Russeff' of NDV, grown on primary cultures of chick embryo fibroblasts, was used. The virus was partially purified with Zn $(OH)_2$[2] and 2 cycles of differential centrifugation. The infectious titer of the virus was determined by the plaque method on monolayers of chick embryo cells and was 4×10^8 pfu/ml. The virus was disrupted in 30 min with equal volumes of peroxide-free ether, with arcton[3], sodium dodecylsulfate (SDS) and sodium deoxycholate (SDC) according to LAVER[4], and with tween 80 and ether[5], triton $\times 100$[6], and nonidet[7]. The hemagglutination (HA) of the intact and disrupted virus was determined by 0.5% suspension of chick erythrocytes and 1% suspension of guinea-pig erythrocytes. The activity of the viral neuraminidase (N-ase) was expressed as the quantity of free N-acetylneuraminic acid (NANA), separated from 100 µg N-acetylneuraminlactose by 0.1 ml virus during 15 min incubation at 37 °C. Free NANA was determined

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