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Synthesis of myelin proteins in a leucodystrophy.

The leucodystrophy "jimpy", a recessive mutation in the mouse, is characterized by a defective myelin formation. At a previous meeting we showed that the activity of several enzymes involved in the synthesis of myelin lipids is diminished, resulting in a decreased amount of these lipids in "Jimpy" brains. Since the myelin basic protein, an important component of the myelin membrane, was also found in a low amount, the synthesis of these protein was studied. A quantitative assay was worked out based on the observation that digestion with pepsin under controlled conditions releases from the myelin basic proteins a specific peptide that can be isolated after acrylamide gel electrophoresis. Using H_3-Prolin we could study the synthesis of this peptide and thus of basic myelin protein. The rate of synthesis was found normal in Jimpy mice. In "chase" experiments, however, the degradation of Jimpy basic protein was greatly accelerated. In the jimpy leucodystrophy the net amount of myelin lipids is regulated therefore by the rate of synthesis, that of the basic proteins, however, by the rate of degradation.

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Effects of prostaglandins E_1 and E_2 and prostaglandin endoperoxides on the isolated human umbilical artery.

Prostaglandin (PG) activity has been found in homogenates of human umbilical vessels(1). Indomethacin inhibits the PG production and reduces the resting tone of human umbilical artery (HUA) strips (2). In the present study the motor responses of spiral HUA strips in Krebs solution to PGE_1 and PGE_2 and to two endoperoxide intermediates in the prostaglandin biosynthesis, i.e. prostaglandin G_2 and prostaglandin H_2 (3), were studied. PGE_1 produced relaxation at 0,1-3 µg/ml but contraction at 10-40 µg/ml. PGE_2 (0,04-20 µg/ml), PGG_2(0,001-0,4 µg/ml) and PGH_2(0,001-0,4 µg/ml) produced contractions only within the concentration range used. The time lapse to reach the peak effect was consistently shorter for the endoperoxides than for PGE_1 and PGE_2. The results support the theory that local synthesis of prostaglandins might be an important mechanism in tone regulation of the human umbilical artery.

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CRYING VITAL CAPACITY IN THE NEWBORN.

Crying vital capacity (CVC), the maximum volume of air expired during a single cry was measured by reverse plethysmography during the first two weeks of life in 77 normal, vaginally delivered preterm and term infants. CVC correlated exponentially with chest circumference ($r = + 0.91$). Mean CVC/CC was similar in preterm and term infants, rose from 2.60ml/cm at 0 - 12h to 2.70ml/cm at 24h ($P < 0.005$) and did not change thereafter. The range of values after 24h in normal infants (- 2SD to + 2SD) is 2.31 to 3.11ml/cm. Clinically normal term infants delivered by elective caesarian section (CS) had a significantly reduced CVC throughout the study period. Infants of women who had laboured and who were delivered by urgent CS also had a reduced CVC but achieved their maximum at 2 days. Infants with lung pathology had gross abnormalities of CVC. CONCLUSIONS: CVC is a simple, precise, non-invasive measurement which can detect abnormalities in clinically normal infants. Babies born by CS have reduced CVC but labour prior to CS lessens the abnormality. Serial CVC measurements promise to be of prognostic value in monitoring neonatal lung function.

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The Incidence of Minor Retinal Abnormalities in Premature Infants and their Relationship to Retinopathy of Prematurity.

Weekly fundus examination by indirect ophthalmoscopy was performed in 796 premature infants during their stay in the neonatal ward; 303 infants were re-examined at 18-24 months of age, and 50 eyes from infants who did not survive were examined histologically. No retinal changes were found in infants of birth weight >2000Gm. In those of birth weight <1500Gm changes were observed in 38%, all of whom received added oxygen in the neonatal period. Minor changes include tortuosity of retinal arteries and new vessel formation, while fibrous tissue formation was rare. Capillary obliteration in the histological specimens were related to levels of arterial pO_2 in life and to duration of O_2 therapy. Most of these changes are reversible and do not interfere with the development of normal vision.