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**RADIOCINEMATOGRAPHIC EXAMINATION OF A NEW TECHNIQUE FOR BRONCHIAL DRAINAGE.**

The production of abundant mucus and occasionally purulent secretions in the airways characterizes different pediatric respiratory diseases. Permeability and quality of the airways must be saved by the elimination of the sputum as often as it accumulates. The many procedures to accomplish this are called bronchial drainage and need the aid of a physiotherapist. A new method will be shown. It is based principally on iterative deep expirations which bring gradually up the secretions until they can be expelled. This is performed in a normal sitting position without external aid by children older than six and therefore it is called autogenic drainage (AD). A child who needed for diagnostic purpose a bronchography had been previously trained for AD and this was registered on magnetic tape recorder after the bronchography and later duplicated on film. It shows the progression of opacified sputum from the peripheral bronchi up to the upper trachea. Cough in comparison with AD doesn't cause advance of sputum because it collapses the airways. It is speculated that this easy method will improve the treatment of chronic obstructive lung diseases in children.

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**Metabolic and endocrine events at the time of the first feed of human milk in preterm and term infants.**

We have shown that the first feed of breast milk in term infants causes increases in the levels of blood glucose, plasma insulin, growth hormone, gastrin and enteroglucagon. We now report the effects of the first feed in two groups of pre-term infants at 28-33 weeks (Group I, n:8, given an intragastric bolus of 2.5 ml/Kg breast milk; Group II, n:5, given a continuous gastric infusion of 2.5 ml/Kg/hour) in order to compare the results with those from term infants. Basal concentrations of blood glucose, lactate and pyruvate were similar in term and pre-term infants, but blood ketones were significantly lower in pre-term infants ( $0.09 \pm 0.03$  mmol/l vs  $0.25 \pm 0.04$  mmol/l,  $p < 0.01$ ). No change in blood glucose followed the feed in either pre-term group in contrast to the increase seen in term infants (mean  $\Delta$  glucose  $0.84$  mmol/l). Basal concentrations of plasma insulin and enteroglucagon were similar in term and pre-term infants but the post-prandial increases in both hormones in term infants were not seen in the groups of pre-term infants. Mean basal growth hormone level was higher in pre-term infants ( $27.7 \pm 5.7$   $\mu$ g/l vs  $17.7 \pm 3.2$   $\mu$ g/l  $p < 0.05$ ) but the post-prandial increase in term infants did not occur in pre-term infants. The metabolic and endocrine changes seen in term infants after the first feed do not occur in pre-term infants with standard methods of feeding.

<sup>†</sup> Aynley-Green et. al. Arch. Dis. Child. 52, 291, 1977

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**The influence of environment, activity and gestational age on evaporative water loss.**

Water loss from the skin can be studied by measuring the vapour pressure gradient in the air layer close to the skin surface. In healthy full term newborn infants the evaporation rate (ER, g/m<sup>2</sup>h) from an interscapular skin area was 40 % lower when the ambient humidity was high (60 %) than when it was low (20 %). In preterm infants the difference was even more marked. Transepidermal water loss (TEWL, g/m<sup>2</sup>h) can be estimated from measurements made from a buttock, the chest and an interscapular skin area. Healthy full term newborn infants were found to have 36 % higher TEWL when active (crying) than when asleep. The TEWL showed an exponential relationship to gestational age, with very high values in the most preterm infants. During the first week of life the TEWL values fell gradually and approached those of full term infants during their first day. The influence of ambient relative humidity on the evaporation rate from the skin also decreased during the first week.

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**The effect of cold exposure on amino acid homeostasis in the newborn.**

Blood glucose, lactate, UN, plasma FFA and individual free amino acid levels were measured in 15 hypothermic/rectal temperature 34.6°C/ newborn infants during a 2hr "warming up" period following admission to our ICU. The increase of rectal temperature by 1.7°C resulted in the decrease of hypothermic hyperlactacidaemia and hyperalaninaemia. Normal levels of other metabolites remained unchanged.

The same metabolites and tissue free amino acid levels were also followed in 15 newborn rabbits exposed for 10 hr to an environmental temperature of 25°C and 20°C. Severe hypothermia developed with an increase of blood lactate and accumulation of total free amino acids in plasma and liver. Alanine, isoleucine, leucine, valine, phenylalanine, tyrosine, ornithine and taurine were elevated in the plasma, alanine and ornithine in the liver and two branched chain amino acids, leucine and isoleucine in the muscle. Since blood glucose was maintained despite the hypothermia in both newborn babies and experimental animals, the observed changes can be interpreted as an increased gluconeogenesis elicited by cold stress.

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**The influence of phenylketonuric (PKU) heterozygote on the development of foetus.**

The analysed material includes offsprings of 200 obligatory heterozygotes (mothers of PKU patients). Total number of children is 405, the ratio of sick to healthy babies is 1,4 : 1. Biological maturity of newborn infants was evaluated on the basis of gestation and delivery anamnesis, birth weight values and the clinical condition just after delivery. Moreover, separate analysis was performed for the mothers' obstetric casualty. Clinical condition of heterozygotic mothers' newborns did not differ from the control group. Mean values of birth weight and height in the analysed group were higher than those of the controls. Increase in birth weight was observed starting from the control group of healthy children, through siblings of PKU patients, up to birth weight values of PKU patients being the highest ones. All these data allow to guess the existence of the factor stimulating intrauterine growth of heterozygotic mothers' foetuses. The above observation could testify for Wolf hypothesis on the protective influence of PKU heterozygote on the foetus.

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**Insulin Receptors in the human placenta with relation to gestational age.**

An intent is made to clarify the role of insulin in fetal growth. Specific insulin binding sites were determined in human placentas obtained after normal deliveries in fullterm, preterm adequates for gestational age and small-for-dates. Highly purified membranes were obtained by ultracentrifugation in a saccharose linear gradient. In the standard binding assay a tracer amount of monoiodinated 125 I-Insulin 128 pM. and increasing amount (0,208-2080nM) of unlabeled insulin were incubated with membrane (200-600ug) for 20hr. at 4°C. in 0,4ml. of Krebs' Ringer phosphate buffer containing 1%B.S.A. This method produces less than 5% degradation of labeled hormone and no receptor degradation. The date on binding was analysed by the Scatchard plot method from which was obtained the total concentration of receptor sites and by plotting the average affinity profile. The negative cooperativity was assessed in the three placental groups by the Hill plot. Although individual differences with regard to gestational age were observed no statistical differences were found between prematures adequates and fullterms. Preliminary results of the small for dates show a decrease of the number of receptor sites. It is suggested that the placental disfunction carries an alteration in insulin receptors causing a small fetus.