49 V/Q IMBALANCE AND RESPONSE TO OXYGEN ADMINISTRATION IN CYSTIC FIBROSIS, ASTHMA AND PNEUMONIA

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O_2 24%, 28% and 31% was given to patients whose Pao_2 was respectively > 7o, 55-7o and < 55. Pao_2-air breathing, and Pao_2-enriched o_2 breathing, allows construction of linear regression lines. Altough the relationship is high /PIO_2=24%, r=o,58/ the predictive ability of the relationship in individual patients is limited. This can be explained by the variability of the V/Q imbalance. Results obtained in the three different groups are shown below in tabular form.

Number of patients	°Anatomical shunt		°°Relative shunt	
	mean	SD	mean	SD
CF /11/	5.9	2.7	7.6	3.6
Asthma /11/	7.o	3.3	5.2	3.7
Pneumonia /26/	lo.o	4.6	4.8	5.2

° Determined by shunt equation-breathing pure O_2

°° Obtained by subtracting anatomical shunt from venous admixture /shunt equation-breathing air/.

50 THE INFLUENCE OF pH AND pCO_2 ON GLYCOLYSIS IN HUMAN ERYTHROCYTES AND IN NEWBORN INFANTS

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The mechanisms of glycolysis in the newborn are poorly understood. Animal experiments have shown that glycolysis and glucose utilisation are severely influenced by hydrogenion concentration. Since there exists some controversial work in the literature concerning glycolysis in erythrocytes own in-vitro studies were performed. The results clearly demonstrate the inhibitory effect of acidosis on glycolysis. A specific pCO_2 effect could not be found. In-vivo studies in a group of newborns suffering from postnatal acidosis proved the inhibition of glycolysis by increased hydrogen-ion concentration. During respiratory acidosis glucose utilisation was impaired and production of lactate reduced.

52 CLINICAL AND EXPERIMENTAL EXAMINATIONS RELATING TO THE PATHOLOGICAL SIGNIFICANCE OF HYPERURICAEMIA IN ACUTE METABOLIC DISTURBANCES

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It was earlier found that an extreme degree of hyperuricaemia can be detected in the blood in severe clinical conditions accompanied by hypoxia. In our present examinations we showed that the poorly bloodsoluble uric acid is precipitated in the form of microcrystals, and phagocytized uric acid crystals in the leukocytes can be detected in the blood of clinical cases of acute metabolic disturbance and hypoxaemia in native preparations with a polarizing microscope. Uricase paralysis in rats /specific enzymatic inhibition with oxonic acid/ enhances the shock sensitivity; the hyperuricaemia induces urate nephropathy of the uric acid in the kidneys, and phagocytized uric acid microcrystals can be observed in the leukocytes. Basides oxonic acid-induced uricase paralysis, xanthine oxidase paralysis with allopurinol /Milurit/ makes rats appreciably tolerant to shock. These results show the particular importance the disturbance of uric acid metabolism in acute metabolic diseases and shock states.

53 ESTIMATION OF HYPERELECTROLYTEMIA DURING INFUSIONS IN INTENSIVE CARE PATIENTS

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A treatment with hyperosmolale Solutions, containing electrolytes in a high concentration, is frequently necessary. In the case of a retention of electrolytes a dangerous imbalance of homeostasis of the body fluids /dysequilibrum syndrome, failures of cardiac action/ will develop. Therefore a frequent control of the parameters of water-electrolyte metabolism is absolutely necessary during parenteral fluid therapy. Besides of supervision of hematocrite, acid-base balance and blood sugar, the measurement of osmolality and conductance of serum play an important role. For both of these methods microeqipments exist for capillare blood. The electrolytic conductance represents the content of ions in a solution. A special precision conductometer allows the determination of relative small changes of values in the serum. Additional measurements of the concentration of electrolytes in the urine on the same way give a good impression of the actual situation of mineral metabolism. The method is simple /also for unskilled/.

FREE COMMUNICATIONS

51 THE TIMING OF INTRAVENTRICULAR HAEMORRHAGE

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The aetiology of IVH is controversial. Present techniques concerning its timing rely either on clinical observations - namely the occurence of convulsions or collapse, or on sophisticated radiochemical methods. We have continuously measured intra-arterial blood pressure, and central and peripheral temperatures in low birthweight infants at risk of IVH in an attempt to identify factors either causative or indicative of IVH.Since we give regular small transfusions of fresh adult blood to low birthweight infants, frequent estimates of the HbA/HbF ratio /Kleihauer technique/ provide a time-base for comparison with post-mortem samples of ventricular clot. When fresh blood containing HbF is allowed to clot, the HbA/HbF ratio is unaltered. With this technique, we have been able to date ventricular haemorrhage. This seems to have occured before the emergence of overt clinical signs. Differences in patterns of monitored data between these infants and ones who had not developed an IVH will be illustrated.

54 REGULATORY ROLE OF THE PLACENTA AND COLOSTRUM

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The placenta lets pass only 1/8 of the tocopherol content of the maternal blood to the umbilical vein, and the serum of the umbilical artery contains in the newborn only traces of tocopherol. In prematures there is no tocopherol at all. Thus, the fetal organs and tissues are nearly completely deprived of tocopherol. The tocopherol supply of the newborn begins with the sucking. The early colostrum is especially rich in tocopherol, since it contains in the first day of the lactation 3,4,5 times as much of it as in the 5th or loth day, or the mature mother's milk. In prematures less tocopherol is contained in the colostrum. Before the first sucking there is no tocopherol at all in the newborn's serum. It appears only after the first sucking, reaching in lo days the normal adult value. On the other hand, in the premature's serum the tocopherol level increases but slowly even in the case of mother's milk nutrition. The esrum level of the pregnant woman, the mode of passage through the placenta and the colostrum's tocopherol are in interrelation and form whole. This regulatory mechanism is effective also in the case of other vitamins.