hypertensive, TENa per lean body mass was above the normal range, and this percentage reduced to 28.5 per cent by thiazide therapy. (4) This feature was more clearly observed in relation with TENa to ECW: 80 per cent of the non-treated hypertensive was above the normal range, while this figure reduced to 28.0 per cent by thiazide therapy. (5) It was, however, difficult to find out a dirct relationship between the value of TENa per ECW and the degree of high blood pressure. (6) Ratio between plasma volume to ECW and/or between ECW to TBW did not illustrate any significant difference among the materials.

Conclusions: It is reasonable to observe sodium disturbance in the hypertensive in relation with TENa to extracellular water.

Studies on Changes of Body Fluids Distribution during Peritoneal Dialysis (I)

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In recent years peritoneal dialysis and hemodialysis by artificeial kidney are effective for treatment of renal insufficiency. We have studied changes of body fluid compartments and chemical findings during dialysis.

0.3 mc HTO, 30 μc ^{22}Na and 1.5 g PAH were injected intravenously, and appearance rate in dialysate by peritoneal dialysis and ascites by carcinomatous peritonitis were examined. The determination of HTO concentration was made with liquid scintillation counter, and ^{22}Na with Well type scintillation counter. The concentration ratio 1 hour after intravenous injection between dialysate and ascites and plasma were HTO ca 50%, ^{22}Na ca 20% and PAH ca 30%. These ratio were lower in ascites than in dialysate.

The concentration ratio of HTO, ^{22}Na and PAH in plasma 1 hour after intraperitoneal injection were HTO ca 40%, ^{22}Na 20% and PAH under 5%.

The appearance rate of HTO, ^{22}Na and PAH in dialysate were compeared with other chemical materials. HTO was almost equal with urea N, creatimine, uric acid and K. PAH and ^{22}Na were lower than these chemical materials.

Changes of body fluid compartments before and after peritoneal dialysis were studied with HTO, ^{22}Na and ^{51}Cr. HTO and ^{22}Na were injected intravenously 12 hours before dialysis, and ^{51}Cr was injected direct before and after dialysis. Total body fluid, extracellular fluid and circulating plasma volume were reduced after peritoneal idalysis. In edematous cases the reduction of extracellular fluid was prominent.

Studies on Changes of Body Fluids Distribution Produced by Surgical Operation (I)

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Changes in water-electrolyte balance brought about by surgical operation have been the object of many investigators. Isotopic methods are newer addition to the armamentarium in the study in this area and assure greater accuracy and convenience.

The present study was carried out on 13 patients undergoing major abdominal surgery at this hospital during last six months. Total body water, red cell mass and sodium concentrations of serum and urine were measured using HTO, ^{51}Cr and ^{22}Na respectively.

The doses were given the day before operation and subsequent samples were collected just prior to, during and immdiately after operation. Post-operative measurements were repeated daily for one week.

Counts were made with the welltype scintillation counter for ^{51}Cr and ^{22}Na, and the liquid scintillatio ncounter for HTO.

Flame photometry was carried out on the same specimen for Na to compare the results obtained b isotopic method.

Circulating plasma volume remained constant throughout the study period. Serum Na concentration showed only slight variation and returned to the preoperative level by the third postoperative day. For the first three days following operation, suppression of urinary excretion of Na and water was accompanied with only slight fluctuation of serum Na level. This suggests that retention of Na and water is in the extracellular space. From the third postoperative day on, diuresis was evident with Na concentration in the urine remaining low.

Simultaneous counting of multiple isotopic sources affords better insight in the study of water and electrolyte dynamics and further experiments are currently under way.