

activity in the assay on the shay rat.

Studies were carried out in patients with peptic ulcer and in healthy subjects. Location of the stomach was marked in gastric fluoroscopy in each case. Two hundred microcuries of $^{131}\text{I-Na}$, $^{131}\text{I-S.G.}$ or $^{131}\text{I-U.G.}$ was given orally in the fasting state. KI was administered one day prior to the test into order to block the thyroidal uptake.

Measurements of radioactivity over the stomach after administration of $^{131}\text{I-Na}$ taken as the control study showed the highest value at 1 hour which gradually decreased in 2 and 3 hours but increased again at 5 hours. After administration of $^{131}\text{I-S.G.}$ or $^{131}\text{I-U.G.}$, the counts over the stomach also decreased after a peak value at 1 hour, but increased again at 5 hours.

After administration of $^{131}\text{I-Na}$, the count at 5 hours was 10% of the value at 1 hour, whereas 5 hours counts were 38.7 and 28% of 1 hour counts after administration of $^{131}\text{I-S.G.}$ and $^{131}\text{I-U.G.}$ respectively, showing a considerably larger accumulation in the stomach of $^{131}\text{I-S.G.}$ and $^{131}\text{I-U.G.}$ than that of $^{131}\text{I-Na}$ at 5 hours.

In order to investigate whether the radioisotopes were accumulated with the wall of

the stomach or within the gastric juice at the time of the appearance of the second peak of radioactivity, the following studies were performed. About 45 microcuries of $^{131}\text{I-Na}$, $^{131}\text{I-S.G.}$ or $^{131}\text{I-U.G.}$ was given orally to rabbits. After 5 hours, the rabbits were sacrificed and radioactivity was measured in the stomach in toto, in the wall of the stomach and in the content of the stomach. In the stomach in toto, the amount of $^{131}\text{I-S.G.}$ present was twice as much as that of $^{131}\text{I-Na}$.

The percentage of radioactivity within the wall of the stomach relative to radioactivity in the stomach in toto was 10.8% after administration of $^{131}\text{I-Na}$, 9.6% after administration of $^{131}\text{I-U.G.}$ and 14% after administration of $^{131}\text{I-S.G.}$, larger proportions of radioactivity being present in the content of the stomach in each case.

From the results obtained in the present study, it would seem that S.G. and U.G. are absorbed from the stomach and intestine and excreted again into the stomach several hours after oral administration.

Further studies are being planned for elucidating the mechanism by which gastric secretion is affected by these substances.

Iron Absorption in Chronic Pancreatitis

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In order to know the possible influence of chronic pancreatic disease upon iron absorption, faecal analysis by means of eleven consecutive days collection after administration of 10 mg $^{59}\text{FeCl}_3$ was done using 7 cases of calcific pancreatitis and 6 cases of chronic pancreatitis etc.

The average absorption rate was 18% showing no significant deviation from average normal value 17%. Three cases which had abnormally increased absorption rate were found to show low degree of transferrin

saturation and one case showing 60% of transferrin saturation with mild disturbance in secretin test absorbed 12%.

No difference was found in absorption rate concerning the duration of disease 1 month to 3 years and 3 to 16 years. The results obtained by secretin test was not found to indicate the iron absorption rate.

The one case of the most severe functional damage showed the very low absorption rate.

The amount of alcohol was not found to influence iron absorption. The alternative ad-

ministration of ^{59}Fe and ^{55}Fe together with or without 10 g of pancreatin or 2 units of secretin per Kg. of body weight was done to see the effect of these preparations on iron absorption.

In this study faceses was collected for 15 days and analysed by means of wet ashing and electroplating method. The determination of radioactivity was made using a liquid scintillation counter. A caution was taken to

maintain intragastric pH higher than 6 more than 2 hours on administration of pancreatin and ferric ammonium citrate was used.

No definite effect of pancreatin upon the absorption rate was observed either in cases of calcific pancreatitis or control. The administration of secretin, however, yielded no change in absorption rate or promoted the absorption in some cases.

XI. Heart and Circulation

Normal Values of Radiocardiography with Analog Computer Simulation Studies

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In spite of its atraumatic usefulness to man, radiocardiography(RCG) have only had limited availability, because of difficulty to analyze its related flow and volume phenomenon. With the aid of analog computer studies, the dynamic process of indicator dilution depending on the flow and volume phenomenon in RCG can be expressed as a mathematical model consisting of single mixing chamber in series and time delay. From these analysis, cardiac output(CO), circulating blood volume(BV), heart volume(HV), right and left, respectively(rHV) and(lHV), and pulmonary blood volume(PBV) can be determined simultaneously.

In the first place, the standardization of normal range of these flow and volume values from RCG should be determined. Then from many statistical studies, it might be concluded that all values should be standardized by the relation to the circulating blood volume. Cardiac output itself in normal state from infant to old have the closest proportion to BV as follows;

$$\text{CO} = \text{Heart Rate}(\text{HR} \times \text{Stroke Volume} = \text{HR} (0.0418 \text{ BV} - 10.46) \text{ (ml)})$$

Then other normal values can be predicted as follows;

$$\text{PBV} = 0.107\text{BV}, \text{HV} = 0.106\text{BV}, \text{rHV} = 0.562\text{HV}, \text{lHV} = 0.438\text{HV}.$$