

## The Correlation Between the Lactic Dehydrogenase Isozyme Pattern and Blood Flow of Gastric Mucosa Measured by $^{131}\text{I}$ -MAA

K. ASANO

*Department of Internal Medicine, Okayama University Medical School, Okayama*

The incidences of gastric ulcer and cancer differ greatly by the site of the stomach and these diseases have predilection for the area covering lesser curvature between antrum and pylorus. The studies on lactic dehydrogenase (LDH) isozyme of gastric mucosa as a biochemical approach for the elucidation of occurrence of gastric diseases.

The different patterns of LDH isozyme were observed in gastric mucosas of human, rabbit and rat, when these results are compared with the section of gastric mucosa, the LDH isozyme patterns were observed the same tendency between the lesser and greater curvatures in these animals. The mucosa of lesser curvature shows predominantly M-type LDH, hence it is more adaptable to anaerobic condition, whereas the greater curvature reveals more of H-type LDH, thus more adaptable to aerobic condition.

In order to clarify whether or not these

differences arise from the difference in the blood flow due to the different sites of the stomach, the blood flow in the stomach of rabbits was measured.

For this experiment at first  $^{131}\text{I}$ -MMA were injected into the aorta and after removing the stomach, scintiscanning was performed. The scintigram of the stomach showed the significant difference between the pyloric and fundic gland areas, suggesting a lesser blood flow in the former region. The same results were observed in the study of  $^{131}\text{I}$ -MAA uptake of gastric mucosa by means of scintillation counter. However, there was no significant difference between the lesser and greater curvatures. In contrast, LDH isozyme in the gastric mucosa of rabbit shows a marked difference between the lesser and greater curvatures, hence the difference in isozyme pattern seems not to be due to the difference in the amount of blood flow.

## Detection of Intravascular Thrombi in Dogs by Means of $^{131}\text{I}$ -labeled Urokinase

M. NOTO, M. MURAKAMI, M. KURODA, K. ONCHI and I. HOSHIBA

*Second Department of Internal Medicine, Kanazawa University School of Medicine, Kanazawa*

At the meeting of this association last year, we reported on the observations of invivo behavior of  $^{131}\text{I}$ -labeled urokinase ( $^{131}\text{I}$ -UK), in which investigations were focused on the distribution of  $^{131}\text{I}$ -UK in human body and the origin of urokinase. The detailed description was seen elsewhere (Jap. J. Clin. Hematol., 7: 288, 1966). In this paper, the studies have been intended to observe the uptake of  $^{131}\text{I}$ -UK by fibrin clot, and to detect intravascular thrombus by external scintillation counting.

Exper. 1: Observations on the uptake of  $^{131}\text{I}$ -UK by fibrin clot in vitro: Human fibrinogen, concentration of 4.0, 1.0 and 0.25

per cent each, respectively, was clotted by thrombin; to each of which small amount of  $^{131}\text{I}$ -UK was added, and incubation was performed at  $37^\circ\text{C}$  for several hours. The uptake of  $^{131}\text{I}$ -UK by the clots was almost proportional to the fibrin concentration. On the other hand, the uptake of  $^{131}\text{I}$ -UK by heat-treated fibrin clot (at  $85^\circ\text{C}$  for 45 min.) and/or the uptake of  $^{131}\text{I}$ Na by fibrin clot was negligibly slight. These findings suggest that  $^{131}\text{I}$ -UK is taken by fibrin clot with considerable affinity, not by contamination.

Exper. 2: Detection of intravascular thrombi in dogs by means of  $^{131}\text{I}$ -UK: Under the pentobarbital sodium anesthesia, the up-

per femoral veins of adult dogs were exposed bilaterally. Thrombus was induced by injection of 5000 u. of thrombin directly into the proximally ligated femoral vein. On the contralateral side, no incision or manipulation was performed.  $^{131}\text{I}$ -UK was injected into the brachial vein of dogs, each after 30 min., 24 hours, and 48 hours following the induction of thrombi. The uptake of RA to the thrombi was recorded by rate meter jointed to the two scintillation detectors which were set to the same sensitivity, and placed each over the bilateral upper legs. Over the site of the fresh thrombi were observed distinctly increased RA and its accumulation till

three hours after the injection. Over the site of 24-hour-aged thrombi, fairly increased RA was seen as compared with the nonclotted control leg, but its accumulation was little seen during the observation. Over 48-hour-aged thrombi, the difference of RA was very little.

These observations support the concept that urokinase, a plasminogen activator, will localize on a fibrin clot, and presumably plasminogen within fibrin clot. The trial to detect occult thrombi by external scintillation counting seems to have the limitation that thrombus is up to 24 hours old or less.

## VII. Thyroid Gland

### The Long-term Follow-Up Study of $^{131}\text{I}$ Treatment for Thyrotoxicosis

M. MATSUOKA, M. HARA, T. MIKUNI, Y. EGUCHI, M. UTOSAWA,  
T. SATO, Y. SATO and M. KOBAYASHI

*Niigata University, Department of Internal Medicine, Niigata*

In 1966, the long-term follow-up study was done about the thyrotoxic patients treated by  $^{131}\text{I}$  between 1954 and 1964.

The condition of 321 cases (66 males and 255 females) was known, as they were either attending the clinic or information regarding death had been received.

Seven were dead, and the causes of death were not related thyrotoxicosis or  $^{131}\text{I}$ -treatment. Our youngest patient was 14 years old and the oldest 62 years old.

The method of determining the dose of  $^{131}\text{I}$  has been kept constant, except the early cases, aiming to deliver 110 or 115  $\mu\text{Ci}$  of  $^{131}\text{I}$  per gram of the thyroid gland.

At the time of review 273 (85.5%) of the patients were euthyroid. Diagnosis of euthyroid, free from subjective and objective complaints, was determined clinically without regard to the results of thyroid function tests. 187 (67.8%) patients become euthyroid after a single dose, 68 (24.6%) required two doses, 17 (6.2%) three doses and one has required

four doses. The mean doses of  $^{131}\text{I}$  for them were 9.9 mCi. The incidence of hypothyroidism was 5.3% after one year from  $^{131}\text{I}$  treatment and reached 19.0% (36 cases) after 10 years, and their mean doses of  $^{131}\text{I}$  were 11.7 mCi. The clinical diagnosis of hypothyroidism was confirmed by the thyroid function tests. The occurrence of leukemia following  $^{131}\text{I}$ -treatment for thyrotoxicosis is not known at our clinic. In one case thyroid nodule was found. 4 mCi. of  $^{131}\text{I}$  was given to a girl of 14 years old and she had been good and well till a nodule was detected in her neck after 11 years from  $^{131}\text{I}$  treatment. The histological picture of the nodule showed that of thyroid adenoma or low-grade adenocarcinoma.

Five cases were remaining thyrotoxic at the time of review. Some of them were receiving the antithyroid drugs and were free from complaints with its small dose.

At the follow up study, the  $^{131}\text{I}$ - $\text{T}_3$  resin sponge uptake were carried with 176 cases. 43% of clinical euthyroidism showed the low