Male Donryu rats were pretreated with 0.06% 3'-Me-DAB and then given 14C-labeled substrates in a biological system in order to study the differential pattern of 14CO₂ in respiratory system from the following three view points i.e., (1) peak time (2) peak height, and (3) total amount of 14CO₂ collected in two hours. With α-fetoprotein (AFP) primary positive rats that are observed a few weeks after the administration of 3'-Me-DAB, the peak time of 14CO₂ generated from 14C-glucose is temporarily delayed right after the appearance of AFP then the time to reach the peak is shortened.

With the rats the AFP primary reaction of which turned from positive to negative, peak time was delay. However, significant difference was not observed in the total amount of 14CO₂ between the treated and control rats. Furthermore, in the period that AFP secondary reaction was positive, the same tendency as that of the primary reaction was observed and then peak height was also increased.

With hepatoma cells glucose-metabolism is intensive, and with cancer-bearing rats, it is considered that the more rapid the proliferation of the cells is, the more glycolysis is enhanced.

It is suggested from the radiorespirometric pattern that anaerobic glycolysis would already be enhanced in the early stage of carcinogenic process, when the oval cells appear. This finding is considered to be interesting related to the production of AFP.

It seems that radiorespirometric analysis could be an useful method for diagnosis of nuclear medicine.

Evaluation of Liver Function Using Stable Isotope Labelled Benzoic Acid in the Patients with Various Liver Disease


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We have attempted to improve the sensitivity of hippuric acid test using stable isotope labelled benzoic acid (D₃-benzoic acid) and gas chromatography/mass spectrometer system. At present, the hippuric acid test is not commonly used as liver function test despite its significance of indicating hepatic antidotal capacity, because it lacks in sharpness in detecting abnormality.

Approximately 100 mg of D₃-benzoic acid was administered orally, and urine was collected during the ensuing four hours. Hippuric acid was extracted from the urine and D₃-hippuric acid derived from D₃-benzoic acid and H₃-hippuric acid synthesized through normal metabolism were determined separately in high accuracy. Ratio of D₃-hippuric acid excreted into urine within four hours to the equivalent weight of D₃-benzoic acid administered was calculated in 45 cases. (9 normal