THE EVALUATION OF CONTINUOUS MEASUREMENT OF $^{13}CO_2/^{12}CO_2$ IN THE BREATH TEST.

Hiroyasu Oh-hara, Yasuhito Sasaki, Satoru Takahashi, Teimi Maeda and Kazuhiko Someya.
The 3rd Department of Internal Medicine, St. Marianna University, School of Medicine, Kawasaki, Kanagawa.

We reported the usefullness of the ^{14}C-breath test for the diagnosis of malabsorption syndromes. With the purpose to expand the applicability of the test comparative studies have been performed in rats using both ^{14}C- and ^{13}C-compounds.

Glycine or glycine-cholate labelled with 90% enriched ^{13}C was given p.o. together with the ^{14}C-labelled compounds to rats with jejuno-colostomy. Radioactivity of $^{14}CO_2$ was measured in a liquid scintillation counter. $^{13}CO_2/^{12}CO_2$ isotope ratio was measured by three methods; (1) CO_2 collected in alkaline solution was transfered into a glass container using liquid nitrogen and vaccum pump and subsequently measured in Matausch-Herzog type mass spectrometer, or expired breath, was directly led into (2) a quadrupole massfilter mass spectrometer or (3) a infrared spectrometer for continuous measurement of the isotope ratio. Radioactivity of $^{14}CO_2$ was measured in a liquid scintillation counter.

$^{13}CO_2$ curves showed identical pattern to $^{14}CO_2$ curves by each of these methods. Massfilter mass spectrometer and infrared spectrometer successfully measured continuously the isotope ratio of $^{13}CO_2/^{12}CO_2$ in the breath. The comulative $^{13}CO_2$ excreted during the initial 40 min. of the study showed linear correlation to the doses administrated, among which smallest dose was 3.5mg per kg body weight.

A simpler instrument for measuring $^{13}CO_2$ such as the infrared analyzer may promote the clinical use of ^{13}C-breath test.

DIFFERENCE IN THE BILIARY EXCRETION PATHWAY BETWEEN BSP AND TAUROCHOLATE

Reiko Miura*, Kenichi Kitani*, Setsuko Kanai*, Shinichiro Kawaguchi** and Masahiro Iio**
* First Laboratory of Clinical Physiology, Tokyo Metropolitan Institute of Gerontology.
** Department of Nuclear Medicine and Radiological Sciences, Tokyo Metropolitan Geriatric Hospital, Tokyo.

The separate active transport pathways into the biliary system are known at least for three different kinds of compounds, organic anions, cations and neutral compounds. Furthermore, for some organic anions, the existence of separate transport systems is believed.

BSP and bile salts are examples for those organic anions, the biliary transport systems of which are believed to be different from each other. However, the biliary excretion of BSP is known to be enhanced by the excretion of taurocholate excretion, and their pathways are not totally independent. The purpose of the present study is to confirm experimentally the separate pathways for these two organic anions.

Male SD rats (9-week-old) were made in BSP Tm (transport maximum) state by a continuous iv infusion of BSP (0.25mg/100g/min) under pentobarbital anesthesia. Twenty min after the start of BSP infusion, at which time BSP Tm can be reached, ^{35}S-BSP, or ^{14}C-taurocholate was injected iv and the sequential biliary excretion of radioactivities were monitored by measuring the specific activities of bile samples collected by a bile duct cannula for the following 60 or 30 min respectively.

Results: The biliary recovery(% of the dose) of ^{35}S-BSP activities in the BSP Tm rats was 2.5 ± 1.5, 62.9 ± 20.8 for 5, 60 min after the injection, while it was 24.6 ± 3.6, 93.3 ± 2.3 in control rats with a saline infusion, showing a marked delay in ^{35}S-BSP excretion in BSP Tm rats. On the other hand, the sequention biliary recovery of ^{14}C-taurocholate excretion in BSP Tm rats was practically identical with control values.

It was concluded that saturation of biliary excretion pathway with BSP does not interfer with taurocholate excretion, which confirms the presence of different excretion pathways for BSP and taurocholate.