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THE EFFECTS OF ACUPUNCTURE RECORDED BY POSITRON ECT. (PRELIMINARY REPORT). T. Yano, K. Mori, A. Ozaki, M. Iio and H. Toyama. Division of Acupuncture Medicine, Meiji College of Acupuncture. Kyoto.

The practitioners of acupuncture have for a long time been engaged in studying the mechanism by which acupuncture achieves its therapeutic effects, EEG and Micro-vibration (MV) results as indices. Following these studies, they proceeded to carry out Positron ECT tests in order to determine the effects of acupuncture stimulus on the physiochemical activity of the brain. Positron ECT was conducted on both healthy people and medical patients (suffering from CVA, encephaloma, etc.) who received electro-acupuncture stimuli on their Hoku and Shou Sanli. The activity of the brain under these stimuli was recorded. Charging time was 10 to 25 minutes, at a frequency of 2HZ at an intensity producing slight muscle twitching. As a result, increased activity was identified in the cortex area and hypothalamus on the side of the brain where the stimuli were given. In some cases, the increase appeared on both sides, suggesting that acupuncture stimulus affects the activity of the cranial nerves over a wider area than previously thought.

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18F-FDG METABOLISM IN PREGNANT RATS AND FETUSES IN HYPOXIC CONDITION. A.MATSUI and N.SAKURAGAWA. NATIONAL CENTER FOR MENTAL, NERVOUS & MUSCULAR DISORDERS. TOKYO. T.IDO,K.ISHIWATA and K.KAWASHIMA. CYCLOTRON & RI CENTER, TOHOKU UNIVERSITY. SENDAI.

F-18-fluorodeoxyglucose (18F-FDG) was injected to pregnant rats exposed to hypoxic atmosphere consisted of 10% O2 in N2 gas, and its distribution to maternal organs,placentas and fetuses were calculated in order to study the energy metabolism in the fetal asphyxia. In hypoxic condition, uptakes of 18F-FDG were significantly increased with time up to 30 min. after injection in maternal and fetal brains and heart, placentas and fetuses compared with control. Effects of duration (0, 30 and 60 min.) of pre-exposure to hypoxia before 18F-FDG injection were estimated at 30min. after injection by two different post-injection states; continuous hypoxic state and placing back in room air. In first state, organ distribution of 18F-FDG were exaggerated especially in maternal fetal brains and hearts by 30 min. pre-exposure, but 60min. pre-exposure had a tendency to inhibit the uptake rates. In second condition, 60 min. pre-exposure has increased fetal liver uptakes and inhibited that of fetal brains and others. Distribution ratio of 18F-FDG to placenta from blood was increased with time, and in hypoxic condition that showed high value. But transportion ratio from placenta to fetus was almost constant in all condition.
From these experiments, we can estimated that placenta may have been responsible to fetal energy demands, which increase in hypoxia, and maintained steady supply state to fetus in any conditions.

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BIODISTRIBUTION AND PLACENTAL TRANSFER OF POSITRON-RADIOPHARMACEUTICALS IN PREGNANT RATS. K.Ishiwata, T.Ido, K.Kawashima, R. Iwata, T.Takahashi, M.Monma, K.Yanai, H. Nakanishi & H.Yamada, Cyclotron & RI Center, Tohoku Univ. Sendai. N.Sakuragawa & A. Matsui, National Center of Nervous, Mental & Musclar Disorders, Tokyo.

Biodistribution and placental transfer of positron-emitting radiopharmaceuticals in pregnant rats were examined. ^{18}F-2-fluoro-2-deoxyglucose(FDG), ^{11}C-glucose/fructose(Glc/Frc), ^{11}C-L-methionine(Met), ^{11}C-D,L-leucine (Leu), ^{11}C-adanine(Ade) and ^{11}C-coenzyme Q_{10} (CoQ) were injected into the pregnant rats in 16-18 days of gestation and their tissue distributions were determined up to 30 min.

The placenta and fetus uptakes increased with time in the order of Ade<Leu<Met<Glc/Frc<FDG. The CoQ was present in high level in the placenta, but the transfer into the fetus was virtually blocked by the placenta. The placenta-to-blood ratios for all drugs increased with time, but the ratios for Ade and CoQ were less than those for other drugs. The fetus-to-placenta ratios for the amino acids were always over 1, which suggested the active transport of the amino acids in the placenta. The ratios for the sugars were less than 1 and that for Ade was much less. With regard to the brain uptake the fetal brain uptake was larger than the matrnal one for each durg.

Our results support the presence of the selectivity in placental transfer of drugs, even constituents in the tissues, that is the blood-placenta barriers.

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EXPERIMENTAL STUDY ABOUT $^{11}CO_2$ METABOLISM OF RAT BRAIN. N.Sakuragawa, A.Matsui, Y. Kohno. National Center for Nervous, Mental and Muscular Disorders.

$^{11}CO_2$ metabolism in rat brain was studied by using newly developed methods to analyze the metabolites in the acid-soluble fraction of tissues. A wistar rat without anesthesia (200-300g) was placed in a glass container where $^{11}CO_2$ (50-100 mCi) was injected. After exposure to $^{11}CO_2$ for 5 min, the rat was taken out and decapitated soon or 20 min later. The brain, frozen into liquid N_2,was homogenized with 0.3 M TCA and separated into the acid soluble(AS) and acid insoluble (AI) fraction. AS fraction was applied to the double column chromatography, which is composed of the upper (Dowex 1-AG) and lower (Dowex 50WX8) column. ^{11}C-radioactivity of each samples was counted by scintilation well counter and corrected by physical decay of ^{11}C. Acid labile fraction($^{11}CO_2$, $H^{11}CO_3^-$, $H_2{}^{11}CO_3$)revealed 84.3-87.7% of total counts of brain which declined to 57.5-58.1% in 20 min. Contrarily, AS fraction showed 14.4% which increased with time. Column chromatography gave 5 different fractions. There was a highest activity in the 5th fraction, containing the organic compounds in the Krebs cycle. The 3rd fraction containing neutral amino acid showed 11-15% which increased to 27.8% in 20 min. We interpret these data to suggest that inhaled $^{11}CO_2$ was carried into brain mostly as an acid-labile fraction and metabolicaly trapped into the organic compounds which increased with time.