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Case Report


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The Effect of Cold Stress on Uterine Artery Blood Flow Velocity Waveforms in Late Pregnant Women with and without Preeclampsia

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Cold stimulus, immersing the hand into ice water, was given to pregnant women with and without preeclampsia. The uterine artery blood flow was observed before, during and after the stimulus by Doppler ultrasound. The pulsatility index in the uterine artery blood flow was significantly increased by the cold exposure in preeclampsia from 1.14 to 1.52, whereas it increased in normal control from 0.95 to 1.25. In two of 11 cases of preeclampsia with fetal growth restriction, cold stimulus to the mother elicited a decrease of variability on fetal heart rate monitoring. Cold stimulus induces the constriction of the uterine artery, leading to a decrease of placental blood flow.

Key words--- uterine artery blood flow; cold pressor test; preeclampsia

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Acute Effects of Combined Administration of Kanamycin and Furosemide on the Stria Vascularis Studied by Distortion Product Otoacoustic Emission and Transmission Electron Microscopy

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Acute effects of kanamycin and/or furosemide administration on the stria vascularis of the guinea pig cochlea were assessed by distortion product otoacoustic emission (DPOAE) and transmission electron microscopy. Kanamycin alone failed to affect the DPOAE levels and ultrastructural changes. Furosemide alone caused a rapid but reversible fall of the DPOAE levels. No remarkable pathological changes in the strial vascularis were observed after a complete recovery of the DPOAEs. On the other hand, furosemide injection following kanamycin with a 2 hour interval resulted in two patterns of significant changes in the DPOAEs, namely, a sudden drop in the DPOAE levels 2 to 3 hours after furosemide injection and a gradual fall in the DPOAE levels immediately after the incomplete recovery from the furosemide-induced decrease of the DPOAE levels. Ultrastructural changes in the stria vascularis included numerous vacuoles in the strial marginal cells and increased electron density of the intermediate and basal cells. These physiological and morphological changes in the stria vascularis may imply new ototoxic features induced by kanamycin potentiated by furosemide.

Key words--- kanamycin; furosemide; stria vascularis; distortion product otoacoustic emission; transmission electron microscopy

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Magnetometric Evaluation for the Effect of Chrysotile on Alveolar Macrophages

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Alveolar macrophages are thought to play an important role in fibrogenesis due to asbestos exposure. In this experiment, we evaluated the effect mainly by unique magnetometry and also by conventional methods such as lactate dehydrogenase (LDH) activity measurement and morphological observations. Alveolar macrophages obtained from Syrian golden hamsters by bronchoalveolar lavages were exposed 18 hours in vitro to Fe₃O₄ as an indicator for magnetometry and chrysotile for experiments. A rapid decrease of the remanent magnetic field, so called "relaxation", was observed after the cessation of an external magnetic field in macrophages phagocytizing Fe₃O₄ alone, while relaxation was delayed in those concurrently exposed to chrysotile. Since relaxation is thought due to the cytoskeleton-driven random rotation of phagosomes containing iron oxide particles, chrysotile is considered to interfere with the cytoskeletal function of macrophages. Release of LDH from chrysotile-exposed macrophages into the medium was recognized, but it was not significantly higher than the controls. Apoptosis was negligible in macrophages exposed to chrysotile by the DNA ladder detection, the terminal deoxynucleotidyltransferase-mediated dUTP-biotin nick end labeling method and morphological observations. Electron microscopical examinations revealed early necrotic changes in macrophages exposed to chrysotile. These findings indicate that cell magnetometry detects impaired cytoskeletal function due to in vitro exposure to chrysotile.

Key words--- magnetometry; chrysotile; alveolar macrophage; cytoskeleton; apoptosis

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Establishment of an Activated Macrophage Cell Line, A-THP-1, and its Properties

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A new macrophage cell line with activated character and unique morphology was isolated by selecting adherent cells from the human monocytic cell line THP-1. The original THP-1 cells had been cultured for more than 9 years using 25 cm² flasks, when cells with a different morphology appeared, adhering to the bottoms of the culture flasks. These were selected by discarding floating nonadherent cells at every subculture. Enrichment of adherent THP-1 cells with long processes proceeded during the cultivation. These adherent THP-1 showed remarkable phenotypic changes, not only morphologically, but also functionally. Namely, increased phagocytic activity, HLA-DR expression and MLR stimulator activity were remarkable. This adherent cell line was designated as activated-THP-1 (A-THP-1), since it demonstrated characteristics of activated macrophages continuously without exogenous stimulation. A cloned A-THP-1 cell line (A-THP-1 C1) also showed the same features and contained about 10% multinucleated giant cells probably caused by cell fusion. This A-THP-1 cell line, the first activated macrophage cell line to be established, provides a good model for understanding of activation mechanisms of macrophages and multinucleation. In this paper, morphological, immunological, and biological characters of this cell line are described.

Key words--- macrophage activation; cell line; THP-1

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Signet Ring Cell Carcinoma of the Stomach: A Clinicopathological Comparison with the Other Histological Types

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A retrospective analysis was carried out on 93 patients with signet ring cell carcinoma of the stomach operated on between 1985 and 1995, to review the clinicopathologic characteristics from the database of gastric cancer at Sendai National Hospital. The results were compared with those for 590 patients with other types of gastric carcinoma. Women were afflicted as commonly as men in the signet ring cell carcinoma group. These patients tended to be younger and to have larger tumors. The histological type was commonly scirrhous and infiltrative. The survival of patients with signet ring cell carcinoma was worse than that of patients with other types of gastric cancer but the difference was not statistically significant. Patients with early signet ring cell carcinoma had a good prognosis, similar to that of the other groups. However, prognosis of patients with advanced signet ring cell carcinoma was poor compared with patients with other types of this disease. In multivariate analysis, the statistical significant prognostic factors were vascular microinvasion and tumor location. These findings suggest that signet ring cell carcinoma of the stomach should be regarded as a distinct type of gastric cancer.

Key words--- signet ring cell carcinoma; gastric cancer
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Effects of Single and Concurrent Intermittent Administration of Human PTH (1-34) and Incadronate on Cancellous and Cortical Bone of Femoral Neck in Ovariectomized Rats

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The purpose of this study is to determine the efficacy of concurrent treatment with human parathyroid hormone, hPTH (1-34), and bisphosphonate (incadronate) in augmenting cortical and cancellous bone mass of femoral neck in ovariectomized (OVX) rats. Forty-eight 11-week-old female Sprague-Dawley rats were divided into eight groups (six animals in each group). The baseline control group was killed at the beginning of the experiment, at 11 weeks of age. An ovariectomy was performed in thirty rats and twelve rats were subjected to a sham surgery. OVX rats were untreated for the first four weeks of postsurgery to allow for the development of moderate osteopenia. These animals were then subjected to various treatments with either PTH, incadronate, or PTH+ incadronate for a period of 4 weeks. Right proximal femora (femoral necks) were used for bone histomorphometry. After OVX 8 weeks, there was a significant decrease in cancellous bone mass and cortical bone area of femoral neck in the OVX rats when compared to the sham control rats. In OVX rats treated with PTH alone or PTH+ incadronate were completely restored lost cancellous and cortical bone mass of femoral neck by increase bone formation. The bone formation parameters (OS/BS, MS/BS) and bone turnover (BFR/BV) seen with PTH plus incadronate were similar to those seen with PTH treatment alone. This indicates that incadronate did not blunt the anabolic action of PTH when used concurrently. Our results suggest the followings: 1) the femoral neck of OVX rats is a suitable sample site for preclinical studies of the prevention of bone loss induced by estrogen depletion; 2) concurrent use of incadronate did not blunt the anabolic effect of PTH; 3) concurrent treatment showed the best results in restoring cancellous and cortical bone mass; and 4) it had additional benefits for bone strength independent of that achieved by the increase in bone mass.

Key words--- femoral neck; bone histomorphometry; concurrent treatment; parathyroid hormone; incadronate

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Enzyme Therapy in Gaucher Disease Type 2: An Autopsy Case

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A Japanese patient with Gaucher disease type 2 was treated with enzyme therapy, alglucerase, from 7 to 22 months of age. Whereas hematologic parameters were normalized and hepatosplenomegaly was alleviated, no improvement in neurologic symptoms occurred, and the patient died of respiratory failure at age 22 months. Postmortem examination revealed massive intra-alveolar infiltration of Gaucher cells in lungs and in the central nervous system, i.e., the presence of Gaucher cells in the perivascular Virchow-Robins spaces in the cortex and deep white matter and extensive laminar necrosis with reactive proliferation of blood vessels and macrophage infiltration of the cerebral cortex. It is suggested that enzyme therapy, with thus far recommended dose, does not prevent long-term respiratory and central nervous system involvement in severe variants of Gaucher disease.

Key words--- Gaucher disease type 2; enzyme therapy; an autopsy case

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