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Short Report

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Gastric peristaltic contractions are controlled by an intrinsic electrical pacemaker located in the mid-body along the greater curve. This study was undertaken to investigate gastric motility in long-term survivors of neonatal gastric rupture who were surgically deprived of their original pacemaker. Four patients, 1 boy and 3 girls, aged between 6 and 12 years were studied. Physiological activity of the gastric remnant was assessed in terms of electrical as well as peristaltic functions by means of electrogastrography and video-recorded barium swallow study. Electrical and mechanical pacing activities were classified into normogastria or dysrhythmia (brady- or tachygastria) according to their frequencies. In these patients, ectopic pacemakers were found to be arising just distal to the site of resection along the greater curve. Electrophysiologically, one patient was diagnosed as having normogastria, and other 3 patients were found to have dysrhythmia (2, bradygastria; 1, tachygastria) on the basis of electrogastrographic analyses. In two of three patients studied further by fluoroscopy, electrical activity agreed well with peristaltic activity. In one patient, however, electrical tachygastria was associated with peristaltic bradygastria. In conclusion, an ectopic pacemaker arises in the stomach that does not remain silent after neonatal surgical loss of its own pacemaker. Noninvasive electrogastrography seems useful in assessing electrical potentials generated by the ectopic pacemaker.

**Key words**--- gastric electrical activity; gastric mechanical motility; neonatal gastric rupture; ectopic pacemaker; electrogastrography

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Effects of a Phosphate Buffered Extracellular (Ep4) Solution in Preservation and Reperfusion Injury in the Canine Liver

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The Ep4 solution, a phosphate buffered extracellular-type solution, is effective in canine lung transplantation following a 96-hour hypothermic (4°C) preservation. In this experiment, we used this solution for liver preservation followed by transplantation. We compared the Ep4 solution with the lactated Ringer's (LR) and the Collins' M (CM) solution (a phosphate buffered intracellular-type solution) in two studies, 1) 48-hour liver preservation, and 2) orthotopic liver transplantation after 5-hour preservation. In the preservation study, purine nucleoside phosphorylase (PNP) levels as a marker of endothelial damage, and alanine aminotransferase (ALT) levels were significantly lower in the livers immersed into the Ep4 solution than in those immersed into other solutions at 36 and 48 hours after preservation. Microscopically, the endothelial injury occurred 24 hours after preservation in the CM solution, and 36 hours after preservation in the LR and Ep4 solutions. In the transplantation study, serum PNP and ALT levels in the livers immersed in Ep4 solution showed a lower tendency compared with those in other solutions at the time of reperfusion, but the histological differences among three groups were not apparent. The present study suggests that the liver can be stored better for a longer time using Ep4 solution than using LR and CM solutions.

Key words--- phosphate buffered extracellular-type solution; Ep4 solution; preservation; reperfusion; liver transplantation

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Does Psychological Stress Improve Physical Performance?

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The purpose of this study is to determine whether psychological stress enhances physical performance and how personality traits affect it. The annual physical test was chosen as the psychological stressor. Ninety three students ran 50 meters as part of the test and one week after that as a control. The pulse rate and time were measured and pulse rate was used as an indicator of psychological stress. All students took the anxiety-trait scale test of the State-Trait Anxiety Inventory. The pulse rate was higher and the time record was better in the annual physical test compared with that of control. When we categorized the subjects by the anxiety-trait scale test, only the high anxiety-trait students could run faster when faced with higher stress. In conclusion, psychological stress can enhance the physical performance of certain students. It is possible that psychological stress and personality traits interact and both of them affect physical performance.

Key words--- psychological stress; physical exercise; personality

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The Effect of Prenatal Methylmercury Exposure on the GSH Level and Lipid Peroxidation in the Fetal Brain and Placenta of Mice

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Effect of prenatal exposure to methylmercury (MeHg) on the glutathione (GSH) levels and lipid peroxidation in the fetal brain was examined. Pregnant ICR mice were injected with 3 mgHg/kg of MeHg on gestational day 12, 13 and 14 (G12-14). On the G14 or G17, the fetal brains were removed and their GSH levels and thiobarbituric acid-reactive substances (TBARS) levels were determined. On the G17, GSH level of MeHg-treated fetal brain was significantly higher than that of the control brain; the TBARS level showed the similar trend but the difference was not significant. These results indicated that the prenatal MeHg treatment disturbed the normal GSH level in the fetal brain and warranted further investigation on the significance of this GSH perturbation.

Key words--- methylmercury; mice; glutathione; lipid peroxidation; fetal brain
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Examination on Biological Activities and Fates of New Steroids, Steroid-17-yl Methyl Glycolate Derivatives

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A variety of acyl derivatives based on the "antedrug" concept were synthesized to evaluate their biological activities, in vitro fate in human serum and examine pharmacokinetics in rats. Among the prepared compounds, acetyl and pivaloyl derivatives (8 and 9) showed strong to vasoconstrictive activity in human, exceeding that of dexamethasone. In rats, topical administration of the compound 8 significantly reduced oxazolone-induced ear edema compared to that of control. These activities were almost equal to that of prednisolone, however 9 did not show any suppression of the oxazolone-induced edema. The in vitro half-lives of 8 and 9 in human serum were 18.2 and 43.8 hours, respectively. Prednisolone and dexamethasone were extremely stable under the used conditions. When compound 8 was intravenously administrated to rats, its metabolites, 20(R)-methyl dexamethasone (4) and carboxylic acid (18), were found in the systemic blood. The total body clearance of 8 was 1734 ml·hr⁻¹·kg⁻¹, which was about 12 times larger than that of dexamethasone. On the other hand, 9 was found to be metabolized instantaneously to methyl prednisolonate (1) in systemic serum. Acetyl derivative 8 derived from dexamethasone may thus be useful as a topical steroid which offers the advantage of a low potential for systemic and local side effects.

Key words--- antedrug; prednisolone; dexamethasone; corticosteroid; topical steroid

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Age-Related Bone Loss: Relationship between Age and Regional Bone Mineral Density

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We assessed the changes in regional bone mineral density according to age and examined the relationship between various regional bone mineral densities. The study was conducted in 985 Japanese women divided into <50-years group (n=435) and >=50 years group (n=550). The total body bone mineral density and that of the head, arm, leg, thoracic (T)-spine, lumbar (L)-spine, ribs, and pelvis were measured using dual energy X-ray absorptiometry. There was a significant generalized reduction of bone mineral density in all regions after the age of 50 years. The most marked age-related decrease was observed in the L-spine. Bone mineral densities in all regions significantly correlated to each other in both age groups, but the degree of significance varied among regions. The relationship between bone mineral density of the L-spine and that of T-spine regions was the most significant in both groups. In the <50-years group, the correlation between bone mineral density of the pelvis and that of L-spine and T-spine was the highest, followed by that between the pelvis and the leg. On the other hand, in the >=50-years group, the correlation between bone mineral density of the pelvis and that of the leg was the highest, but not the L-spine or T-spine. Since spine measurements are affected by vertebral deformity and/or aortic calcification, our findings suggest the pelvis may be a useful region for screening measurements of bone mineral density, especially in older women.

Key words --- age; bone mineral density; dual energy X-ray absorptiometry (DEXA); pelvis

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Apoptosis of Human Endometrium Mediated by Perforin and Granzyme B of NK Cells and Cytotoxic T Lymphocytes

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Endometrial stromal granulocytes (EGs) were found to be a major component of human endometrial stroma in the late secretory phase. However, the role of EGs in the mechanism of human endometrial menstruation has not been clarified. Immunohistochemistry of CD56, perforin, granzyme B, and vimentin, in situ detection of apoptosis by TUNEL (TdT-mediated dUTP-biotin nick and labeling) and electron microscopy were performed in endometrial tissue samples with normal menstrual cycles. We analyzed the number of immunostained cells in the functional layer of stroma and the number of apoptotic cells detected by TUNEL in the endometrial glandular cells. Double-staining revealed that CD56-positive endometrial stromal cells were simultaneously positive for both perforin and granzyme B, and negative for vimentin, which recognized stromal tissue. Vimentin was positive for the predecidual cells and negative for EGs. CD56-positive EGs involving perforin and granzyme B were progressively recruited during the secretory phases before menstruation. Apoptosis in endometrial glandular cells increased from the late secretory phase, which maximized at the menstrual period. This finding suggests that the cytotoxic granules released from EGs, which are derived from cytotoxic T lymphocytes and natural killer cells, are initiators of the apoptotic pathway that induces endometrial menstruation.

Key words--- endometrium; menstruation; apoptosis; perforin; granzyme B

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Reduced Immune Function and Malnutrition in the Elderly

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An important observation in elderly subjects is their susceptibility to infection associated with a decline in host immune function. Nutrition is also an important factor that influences host defense against infection. We, therefore, evaluated the relationship between nutritional status in 155 healthy subjects ranging in age from 20 to 99 years and various immunological parameters, including the phagocytic and bactericidal activities of neutrophils and monocytes, superoxide production and chemotaxis of neutrophils, lymphocyte subsets, blastoid transformation and serum immunoglobulins. Aging was associated with increased phagocytic activity of neutrophils but not bactericidal activity, superoxide production or chemotaxis of neutrophils. Aging was also associated with a significant decrease in the number of lymphocytes as well as a decline in mature T cells and helper/inducer T cells but with increased numbers of activated T cells, suppressor T cells and natural killer cells. In addition, blastoid transformation in response to phytohemagglutinin (PHA) and concanavalin A (Con A) was significantly reduced in aged subjects. A poor nutritional status was noted in individuals 60 years of age or older. The nutritional status did not influence neutrophil function but correlated significantly with the number of lymphocytes and degree of blastoid formation with PHA and Con A stimulation. Our results suggest that the cell-mediated immunity in elderly subjects is reduced as a result of malnutrition, and that improvement of the nutritional status may enhance the immune function, likely contributing to their successful aging.

Key words--- aging; nutritional status; immune function

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Identification of Truncated Human Glutamate Transporter

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Excitatory amino-acid carrier 1 (EAAC1) is a high affinity Na⁺-dependent L-glutamate/D, L-Aspartate transporter protein. A truncated form of EAAC1 (tEAAC1) was identified by reverse transcription and polymerase chain reaction in the human cell line, ACHN, in which EAAC1 mRNA was highly expressed. The deduced amino acid sequence of tEAAC1 lacks 31-77 amino acids including the first extracellular domain. The mRNA encoding tEAAC1 was detected in various cells of human origin but not in cells of rat or mouse origin. The expression of tEAAC1 mRNA was proportional to that of full-length EAAC1 (fEAAC1) mRNA, suggesting common transcriptional regulation between tEAAC1 and fEAAC1. In addition, the expression of EAAC1 mRNA was relatively low or non-existent in non-adherent cells.

**Key words**--- RT-PCR; EAAC1; EAAT3; glutamate transporter

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A Resuscitated Case from Asphyxia by Large Bronchial Cast

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A 62-year-old woman with bronchiectasis suffered from asphyxia due to a large bronchial cast that obstructed the bronchial tree. Immediate bronchoscopic suction of a bronchial cast of 17 cm in length through the intubated tube relieved the patients without any complications. Large bronchial casts appear to be rare in this century but it should be considered in patients with acute exacerbation of excessive sputa not only in patients with asthma or allergy but also in patients with respiratory tract infection.

Key words— asphyxia; bronchiectasis; bronchial cast

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Study on *Chlamydia Trachomatis* Infection among Students and Pregnant Women in Japan: A Step Toward Developing a Reliable Method for Sexual Behavior Study

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2450 sera from students and 5215 sera from pregnant women were examined for the presence of *Chlamydia trachomatis* (CT) antibody. CT antibody positive rates were less than 5% with the students and 24.5% with the pregnant women suggesting the latter is significantly higher than former. The results provided a base for discussing possibility of using CT infection as a reliable method for studying sexual behavior.

**Key words**--- *C. trachomatis* infection; sexual behavior surveillance

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