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ABSTRACT

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New Knowledge from Past Decade: Role of Zinc in Immune System

Nippon Eiseigaku Zasshi, 68, 145–152 (2013)
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Zinc (Zn) is essential for normal cell structure and physiology. Its deficiency causes growth retardation, neuronal degeneration, and immunodeficiency. Zn homeostasis is tightly controlled through Zn transporters and metallothioneins, which regulate Zn concentration and Zn distribution in individual cells, and contributes to Zn-binding protein in cells. Although many molecules involved in these processes have Zn-binding motifs, the molecular mechanisms underlying the role of Zn in the immune system have not been clarified. Recently, we and other groups have demonstrated that Zn plays diverse and specific roles in vivo and in vitro, in studies on the genetic knockout of Zn transporter functions. In this review, we discuss the impact of Zn on mast cell-mediated allergy and T cell-mediated immune responses. We also describe Zn dysregulation as a leading health problem in allergy and immune responses.

Principles and Methods for Vaccine Epidemiology: Evaluation of Immunogenicity and Effectiveness of Pandemic H1N1 Influenza Vaccine

Nippon Eiseigaku Zasshi, 68, 153–160 (2013)
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Influenza vaccination is the most effective method of preventing influenza and its complications. In the 2009 influenza A (H1N1) pandemic, monovalent strain-specific pandemic vaccines were developed rapidly. However, they were only available in limited supply at the initial stage of the vaccination campaign. Thus, tiered use of vaccines, after careful prioritization and determination of dose per individual, was important to maximize the benefit of the available doses. In this study, the principles and methods of epidemiological evaluation of influenza vaccines were investigated, focusing on the immunogenicity and effectiveness. The results of the study of the 2009/H1N1 pandemic will then be detailed.

Comparison of Data between Intratracheal Instillation and Inhalation Studies for Estimation of Harmful Effects of Manufactured Nanomaterials

Nippon Eiseigaku Zasshi, 68, 161–167 (2013)
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We reviewed the difference in data between the inhalation and intratracheal instillation studies of inhaled materials and how to diminish the difference in data between the two studies in order to examine the usefulness of intratracheal instillation study for the estimation of the harmful effects of manufactured nanomaterials. The differences in the data of the intratracheal instillation study from those of the inhalation study, which is the gold standard, are as follows: (1) artificial effect of the bolus, (2) nonuniformity of lung distribution of materials, (3) no threshold of clearance, (4) low deposition level of materials in the brain and neonates, and (5) the effect of dispersant on the lung. We consider that the approaches to diminishing the difference in data between the two studies are as follows: (1) maintain the dispersion of nanomaterials, (2) avoid the overdosing of nanomaterials, and (3) maintain a low concentration of the dispersant in the intratracheal instillation study.

National Survey on Eyelash Extensions and Their Related Health Problems

Nippon Eiseigaku Zasshi, 68, 168–174 (2013)
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Background: Eyelash extensions involve the attachment of synthetic eyelashes made of chemical fibers or other materials individually onto natural lashes. However, there are no uniform or well-established guidelines for this procedure. Consultations with ophthalmologists and local consumer centers regarding eyelash-extension-related skin and eye disorders have been increasing yearly throughout Japan. This study was conducted to obtain epidemiologic data on eyelash extensions and their related health problems among the Japanese.
Methods: A web-based survey was prepared and conducted with questions regarding the basic characteristics of the study participants, their experience with eyelash extensions (including the number of procedures, frequency of extension, year of first extension, and years since the first extension), and any extension-related health problems. Data from 2000 women, aged 15–59 years and randomly selected from across the country in accordance with the demographic composition of Japan, were included in the analysis.
Results: In total, 205 (10.3 %) respondents reported having experienced eyelash extensions (average, 6.2 procedures; median, 3.0), with a peak among those aged 25–29 years and a larger proportion of those living in urban areas than in rural areas. Of these women, 55 (26.8 %) experienced health problems such as ocular hyperemia, pain, and itchy swollen eyelids. Multivariate analysis revealed that short intervals of extensions were associated with health problems (multiadjusted odds ratio (95 % confidence interval); 2.88 (1.09–7.61)).
Conclusions: Eyelash extensions are a popular procedure, especially among urban, young women. However, attention must be paid to the potential health risks of the procedure.

Physical and Mental Reactions to Forest Relaxation Video: Studies on Gender Differences

Nippon Eiseigaku Zasshi, 68, 175–188 (2013)
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Objective: To explore gender differences in physical and mental relaxation in subjects who watched a forest relaxation video.
Methods: The subjects were 12 males and 12 females in their 20's, with an average age of 21.67 ± 1.00 and 21.42 ± 1.56, respectively. They rested for 5 min, and then watched either a forest relaxation video or control video (grey screen, no sound). After the video session, they rested again for 5 min. Thus, the total experimental duration was 20 min. Before and after the video session, subjects completed visual analog scales (VAS) on mood and profile of mood states (POMS) questionnaires. Subjects also pointed out the most comfortable scenes on the video. In addition, we measured their heart rates. Analyses were based on the semantic differential (SD) technique.
Results: The heart rate of male subjects decreased just after watching the relaxation video ($p < 0.05$–0.01), and the LnHF increased ($p < 0.05$–0.01), indicating significant activation of the parasympathetic nervous system. Regarding VAS scales, the "refreshment" score increased in male subjects ($p < 0.01$). In females, all three scores for "pleasantness", "calmness", and "refreshment" increased after watching the relaxation video ($p < 0.05$–0.001). In addition, the "tension–anxiety" score of the POMS decreased after watching the video ($p < 0.05$).
Conclusions: Both male and female subjects felt relaxed after the forest relaxation video. Especially, heart rate changes suggested that male subjects experienced relaxation after the video, whereas female subjects experienced mental relaxation.

Normative Study of the Boston Naming Test in 7-Year-Old Japanese Children

Nippon Eiseigaku Zasshi, 68, 189–196 (2013)
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Objectives: The Boston naming test (BNT) has been used to assess the language development of children in many epidemiology studies, and its usefulness is confirmed. The BNT consists of 60 black and white line drawings of objects and animals. There are no normative data available for this test for Japanese children. The purpose of this study was to collect normative information in Japan and to examine the correlation between the score of the BNT and intelligence quotient (IQ) of the wechsler intelligence scale for children third edition (WISC-III).
Methods: The BNT was translated into Japanese and administered in children registered to the birth cohort of the Tohoku Study of Child Development at the age of 84 months. The participants for analysis in this study were 449 children (237 boys, 212 girls).
Results: There were four items with percentage scores below 1 %; igloo, knocker, muzzle, and yoke. Many Japanese children could answer 'abacus' and 'compass', which are difficult for US children. Although the score of the BNT correlated with IQ of the WISC-III ($p < 0.001$), as compared with the previous studies, the correlation coefficient was low.
Conclusions: The BNT is quick and easy to use and valuable for researchers in evaluating language ability in children. Since the BNT was developed in the United States, the cultural values of that country are reflected in the BNT score. This implies that the BNT should be modified to fit Japanese population.

Experience of Weight Loss and Its Related Factors of Thin Females Who Still Wished to Lose Weight Among Junior High School Students

Nippon Eiseigaku Zasshi, 68, 197–206 (2013)
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Objective: This study was aimed at clarifying the experience of weight loss and its related factors of thin females who still wished to lose weight among junior high school students.
Methods: The subjects were 1,302 males and females in the second and third grades in 17 junior high schools in a area in Wakayama Prefecture, Japan. The anonymous self-administered questionnaire included items on attributes, items relevant to weight loss, lifestyle, subjective symptoms, and items relevant to stress. A logistic regression analysis (likelihood ratio) was used with the question items showing a statistically significant difference when comparing the two groups as independent variables to identify the factors related to the experience of weight loss.
Results: There were 1,168 respondents (response rate, 89.7 %). Eighty females who were less than -10 % of the standard for obesity, but who still wished to lose weight, were selected from among 544 females. They were divided into two groups: those who had experienced losing weight (N = 31, dieting group) and those who had never experienced losing weight (N = 49, nondieting group). Between the two groups, there was a statistically significant difference in eight question items. The logistic regression analysis showed that believing oneself to be heavy by self-assessment, going to bed after midnight, and a short attention span were factors related to the experience of losing weight.
Conclusion: Forty percent of the thin females who still wished to lose weight experienced weight loss. Distortion in the self-assessment of one's figure, inappropriate lifestyle, and subjective symptoms were designated as related factors.

Economic Damage Caused by Lowered Prices in the Agro-Food Sector in Areas Contaminated by Radioactive Materials Leaked from the Nuclear Power Plant Severely Damaged by the 2011 Great East Japan Earthquake: Consideration from the Viewpoints of Epidemiology, Economics and Social Psychology

Nippon Eiseigaku Zasshi, 68, 207–214 (2013)
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Introduction: Large amounts of radioactive materials were leaked into the environment from the Fukushima Daiichi nuclear power plant (FDNPP) of the Tokyo Electric Power Company, which was severely damaged by the 2011 Tohoku Region Pacific Coast Earthquake and accompanying tsunami. Economic damage due to lowered prices and supplies of food products produced in the areas contaminated by the radioactive materials leaked from the damaged FDNPP to the agro-food sector in the affected areas is notable. In Japanese, this is known as *fuhyo higai*. In this study, we investigated *fuhyo higai* from the viewpoints of epidemiology, economics, and social psychology in an effort to seek solutions.
Method: Information was obtained from articles in print and on the Internet.
Results and discussion: *Fuhyo higai*, or economic damage of the agro-food sector, which is the main industry in the contaminated areas, is serious because it is difficult to reassure the general population regarding food safety. This *fuhyo higai* does not derive solely from rumor. It has been reported that improving the science literacy of the general population is important as a countermeasure against *fuhyo higai*, but this may not be effective because of the human social structure and behavior of people who seek subjective safety. Almost all radiological laboratory results of samples of food produced in the contaminated areas were below detectable limits. Very high values were rarely detected. In general, information about the dose–response relationship is obtained under the assumption that there may be error in the response but not in the dose. The rare cases of extremely high radiological values of food samples from the contaminated areas may correspond to large errors in dose. However, it is difficult to deny a high-dose risk. The reported information on the dose–response relationship obtained under the assumption that there is no error in dose is not sufficient. Thus, response, i.e., health risk, cannot be correctly estimated. This leads the general population to choose food products from areas far from the FDNPP over those from the contaminated areas. In order to resolve this problem, thorough decontamination of radioactive areas, including large forests, is necessary for the market to regain competitiveness to the level it was before the accident. The cost of such decontamination is enormous and requires much labor. Decontamination will create employment and is indispensable in restoring the deteriorated economic conditions of the affected areas.