

CONCLUSIONS: MVAD in pregnancy causes learning and memory impairment of adult offspring.

EFFECTS OF MARGINAL VITAMIN A DEFICIENCY ON LONG-TERM POTENTIATION IN YOUNG RATS

Submitted by Ting-Yu Li

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INTRODUCTION: Vitamin A is an essential micronutrient for brain development. Marginal vitamin A deficiency (MVAD) remains a subclinical public health problem in children, but little is known about the mechanism by which it affects brain development beginning from embryonic period and early postnatal period.

OBJECTIVE: The objective of this study was to study the effects of MVAD on the hippocampal CA1 long-term potentiation (LTP) in young rats.

METHODS: The MVAD group was fed a vitamin A-deficient diet (400 IU/kg vitamin A), and the control group was fed a vitamin A-sufficient diet (6500 IU/kg vitamin A) at 3 weeks before coitus. Serum vitamin A was assessed by high-performance liquid chromatography. Hippocampal CA1 LTP was detected by electrophysiologic technique, and the ultrastructure of synapses was observed by electron microscope.

RESULTS: The changes of field excitatory postsynaptic potentials slope ($25.4\% \pm 2.01\%$) in MVAD rats aged 7 weeks was much lower than that in the control group ($57.5\% \pm 8.6\%$). The changes of slope of field excitatory postsynaptic potentials induced by MVAD in young rats could be replenished after addition of retinoic acid (RA); however, LTP impairment was observed again after addition of RA antagonist into the solution of the control group. No differences of LTP were found after addition of FeSO_4 or ZnSO_4 . The curvature of the synaptic interface of the MVAD group was less than that of the MVAD group that was supplemented with RA and of the control group.

CONCLUSIONS: MVAD during the embryonic and early postnatal period can directly impair the hippocampal CA1 LTP of young rats.

EFFECT OF BCG VACCINATION ON SPLENIC DENDRITIC CELL DEVELOPMENT IN NEONATAL BALB/C MICE

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INTRODUCTION: As an immunoregulator, Mycobacterium BCG has the potential to be applied in allergic disease such as asthma prevention in clinic. Previous studies showed that neonatal BCG vaccination promoted mouse splenic T helper 1 development.

OBJECTIVE: The objective of this study was to investigate further the impact of BCG vaccination on dendritic cell (DC) development in neonatal mice.

METHODS: Neonatal and adult BALB/C mice were divided into 2 groups: the control group and the BCG-treated group in which BALB/C mice were inoculated with 1×10^5 colony-forming units of BCG intraperitoneally. After 4 weeks, splenic cells were isolated and co-stimulatory molecules and major histocompatibility complex molecules were analyzed by flow cytometry on CD11c-positive cells.

RESULTS: $\text{CD11c}^+\text{CD8}\alpha^+$ and $\text{CD11c}^+\text{CD8}\alpha^-$ DCs were found in spleen cells of BALB/C mice. In comparison with the control group, the percentage of $\text{CD8}\alpha^-$ DCs was significantly decreased (45.00 ± 14.14 vs 67.00 ± 8.27) and that of $\text{CD8}\alpha^+$ DCs was strikingly increased (55.00 ± 14.14 vs 33.00 ± 8.27) in BCG-treated neonatal mice. In contrast, the percentage of $\text{CD8}\alpha^-$ DCs markedly increased from 57% to 70% and that of $\text{CD8}\alpha^+$ DCs noticeably decreased from 43% to 30% in adult mice that were vaccinated. BCG vaccination upregulated the expression of co-stimulatory molecules on DC in adult and neonatal mice.

CONCLUSIONS: Our results indicate that development of T cells was induced by BCG vaccination through an effect on DC differentiation and maturation in BALB/C mice, possibly not only by DC phenotype but also by cytokines.

IMPACT OF ZINC SUPPLEMENTATION ON RESPIRATORY AND GASTROINTESTINAL INFECTIONS: A DOUBLE-BLIND, RANDOMIZED TRIAL AMONG URBAN IRANIAN SCHOOLCHILDREN

Submitted by Nahid Masoodpoor

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INTRODUCTION: In addition to inhibiting growth, mild zinc deficiency is probably associated with reduced resistance to infection in children, but it has been difficult to establish this link; however, children with severe

zinc deficiency have been found to be at increased risk for diarrhea and respiratory diseases.

OBJECTIVE: The aim of this study was to evaluate the roles of zinc supplementation in the episodes of respiratory and gastrointestinal infections in children.

METHODS: This study was a randomized, double-blind, placebo-controlled trial of 90 children (50 boys and 40 girls aged 7–12 years) who were underweight or had stunted growth. They were supplemented with 10 mg of zinc or placebo on school days for 6 months. Episodes of respiratory and gastrointestinal infections were recorded monthly.

RESULTS: At the end of this study, significant effects of zinc supplementation on the decreased number of episodes of respiratory and gastrointestinal infections were seen during the full 6 months.

CONCLUSIONS: On the basis of this study, zinc supplementation decreased the number of episodes of respiratory and gastrointestinal infections in school-children who were underweight or had stunted growth.

SEVERE LUNG HYPOPLASIA IS OBSERVED IN *DHCR24*-KNOCKOUT MICE: A MOUSE MODEL OF DESMOSTEROLOSIS

Submitted by Rusella Mirza

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INTRODUCTION: The *DHCR24* gene encodes an enzyme that converts desmosterol to cholesterol in the last step of cholesterol synthesis. Desmosterolosis is an autosomal-recessive disorder that is caused by mutation in the *DHCR24* gene, resulting multiple developmental anomalies.

OBJECTIVE: The objective of this study was to understand the pathophysiology of desmosterolosis.

METHODS: *DHCR24*-knockout mice were used in this study. All homozygous mice ($-/-$) died soon after birth. *DHCR24*^{-/-} mice demonstrated features of lethal restrictive dermopathy, associated with impaired skin barrier function as a result of hyperproliferation of undifferentiated keratinocytes throughout the epidermis. One other possible cause for neonatal death in *DHCR24*^{-/-} mice is respiratory failure, as evidenced by severe cyanosis immediately after birth. We therefore studied the lung development of these mice. Lungs from the newborn alive pups were subjected to weight measurement and histologic and Western blot analyses.

RESULTS: *DHCR24*^{-/-} mice were identified by their phenotype and genotyping. Lung-to-body weight ratio was decreased in *DHCR24*^{-/-}. The space between lung surface and the thoracic wall was significantly increased as a result of less expansion of the lung. The majority of the lung portion consisted of collapsed alveoli and decreased saccular space in *DHCR24*^{-/-} mice. No differentiation defect in alveolar type I cell was detected by Western blot and immunohistochemistry with anti-T1 α antibody, a type I cell-specific marker. Immunohistochemistry with anti-caveolin 1 demonstrated no change in vascular development.

CONCLUSIONS: A distinct saccular hypoplasia in *DHCR24*^{-/-} mice suggests that there is an important role of *DHCR24* in lung development. Additional experiments with surfactant compositions are needed to explore the underlying respiratory pathology.

USING Q-METHODOLOGY TO EXPLORE PREFERENCES FOR CARE OF ADOLESCENTS WITH CHRONIC DISORDERS: 4 PROFILES

Submitted by AnneLoes Van Staa

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INTRODUCTION: Adolescents with chronic disorders are seldom asked to give opinions about their preferences for care, even though they are frequent health care users and soon need to take over the responsibility of managing their own care.

OBJECTIVE: The aim of the study was to investigate care-related preferences of adolescents with chronic disorders.

METHODS: A Q-methodologic study was conducted in a random sample of 31 adolescents with various congenital and acquired disorders from the total population of Erasmus Medical Center-Agia Sophia Children's Hospital (12–19 years). Adolescents rank-ordered 37 statements about preferences for care and self-care using a quasi-normal distribution. Factor analysis was applied to identify clusters in the Q-sorts, groups of adolescents with common preferences.

RESULTS: Four profiles were distinguished: concerned and compliant, backseat patient, opinionated and careless, and worried and insecure. Differences between profiles are related to independence competencies, level of involvement in management of the illness, adherence to therapeutic regimens, and appreciation of their parents' role. All adolescents want to have an important say in treatment-related decisions. Although adolescents are used to being accompanied by their parents in the con-

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