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 schoolchildren 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-

sultation room, they sometimes prefer to be on their own.

CONCLUSIONS: Four different preference profiles were uncovered. Caregivers recognize these profiles in daily practice. Because the goal of Q-methodology is to establish different patterns but not their prevalence, the distribution of profiles will be explored in a large follow-up survey. Additional use of these profiles in daily practice will be also explored, because rank-ordering the statements stimulated adolescents to talk about care issues.

EFFECT OF PERINATAL IRON DEFICIENCY ON BEHAVIORAL DEVELOPMENTS AND MYELINATION AROUND THE HIPPOCAMPUS IN RATS

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INTRODUCTION: Iron deficiency is a common nutritional disorder. The effect of iron deficiency on myelination of specific brain regions and their relevant behavior has not been well documented.

OBJECTIVE: The objective of this study was to determine the consequences of perinatal iron deficiency on behavioral and myelination of specific brain regions in rats.

METHODS: Sixteen dams were randomly assigned to iron-sufficient or low-iron diets during gestation and lactation. Thereafter, all offspring were fed the iron-sufficient diet and were assessed for behavioral and neurologic developments. Behavioral assessments included sensorimotor function tests, a recognition memory task, and a spatial learning task. The density of myelination around the hippocampus was measured by 2′,3′-cyclic nucleotide 3′-phosphohydrolase (marker of oligodendrocyte) by means of immunohistochemistry and quantified by analysis of integrated optical density. The regions of interest included the corpus callosum and the fimbria of the hippocampus.

RESULTS: Iron-deficient rats showed behavioral impairments in sensorimotor functions and recognition memory task but no significant differences were found in the spatial learning task. Iron-deficient rats had significantly reduced density of myelination than control rats in the corpus callosum but had no difference in the fimbria of the hippocampus.

CONCLUSIONS: This study shows that perinatal iron deficiency can significantly alter the behavioral outcomes in rat pups and can profoundly influence the development of myelination in specific brain regions.

EXPRESSION AND MODULATION OF AQUAPORIN 5 IN HYPEROXIA-INDUCED LUNG INJURY

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INTRODUCTION: Bronchopulmonary dysplasia (BPD) is a common disease that is caused by mechanical ventilation with persistent high-concentration oxygen in newborns, especially in preterm infants. One of the most important reasons is oxygen toxicosis. In physiologic conditions, liquid in the lung tissue is also transferred by aquaporins (AQPs), but the mechanism of aquaporins in hyperoxia-induced lung injury and lung dropsy is not clear.

OBJECTIVE: The objective of this study was to explore the expression and the modulation of AQP5 in hyperoxia-induced lung injury.

METHODS: Lung tissue was harvested after high-concentration oxygen exposure on the third, seventh, and 14th days in rats. The expression of AQP5 mRNA level and the location were detected by reverse-transcription polymerase chain reaction and immunohistochemistry, respectively, and compared with that in rats that were administered an injection of dexamethasone.

RESULTS: AQP5 was strongly labeled in alveolar epithelial cells. The expression of AQP5 in hyperoxia groups (3, 7, and 14 days) revealed a notable decline as compared with the control group, with no change even in the hyperoxia 14-day group. There was no difference between hyperoxia groups and hyperoxia + dexamethasone groups on AQP5 mRNA level.

CONCLUSIONS: The significant decrease of AQP5 expressed in hyperoxia-induced lung injury may be an important reason for abnormal water movement, which leads to pulmonary edema. Dexamethasone seems to have no effect in modulating AQP5 expression in acute lung injury.

PROTECTIVE EFFECT OF *N*-ACETYLCYSTEINE ON HYPEROXIA-INDUCED LUNG INJURY AND ITS INTERACTION WITH P38 MITOGEN-ACTIVATED PROTEIN KINASE SIGNALING PATHWAY

Submitted by Feng Xu
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INTRODUCTION: *N*-Acetylcysteine (NAC) is an effective oxidation inhibitor, but the protection of NAC in hyperoxia-induced lung injury is unknown.

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

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