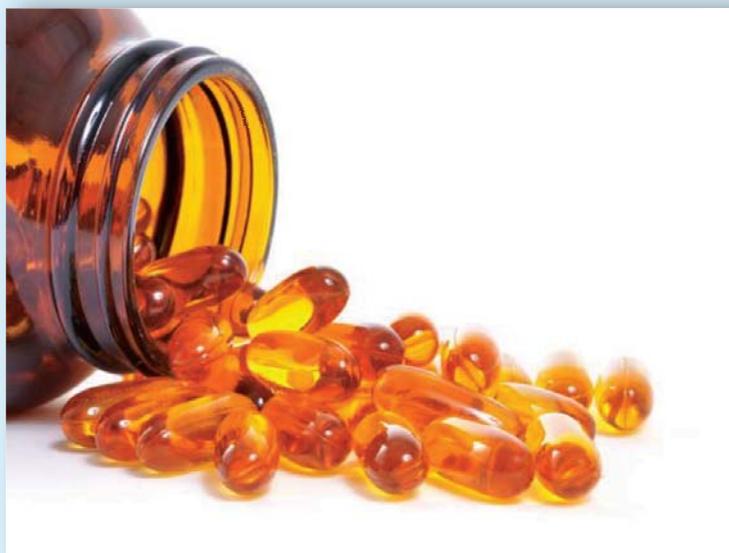




Vitamin D Improves Glycemic Control in Type 2 Diabetic Patients

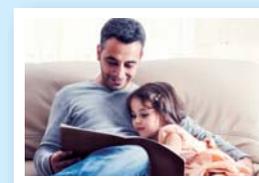


Cholecalciferol helps improve blood glucose control and cholesterol profile in vitamin D3-deficient type 2 diabetic patients. Type 2 diabetes mellitus (T2DM) is considered as one of the nonskeletal diseases associated with vitamin D deficiency. Both T2DM and vitamin D deficiency have similar risk factors, such as obesity, aging, and sedentary lifestyle. Cardiovascular diseases (CVDs) and metabolic syndrome disorders are also associated with vitamin D deficiency. Vitamin D plays a functional role in glucose homeostasis through its effects on insulin secretion and sensitivity. It may reduce insulin resistance (IR) indirectly through its effect on calcium and phosphate metabolism and through upregulation of the insulin receptor gene. A study was conducted with the objective to determine the effects of vitamin D supplementation on glucose homeostasis and lipid profile in type 2 diabetic patients who have vitamin D deficiency. One hundred twenty-five type 2 diabetic patients taking oral hypoglycemic agents as mono- or combination therapy were recruited from the diabetes and endocrinology clinic. Subject demographics, duration of diabetes, antidiabetic medication, body mass index (BMI), pulse, and blood pressure (BP) were assessed. Laboratory measurements of serum vitamin D3 level, HbA1c, fasting plasma glucose (FPG), and lipid profile were measured. Homeostatic model assessment-insulin resistance (HOMA-IR) was calculated whenever fasting insulin (FI) was available. Forty-one patients (27 males and 14 females) were started on cholecalciferol replacement—45,000 units once weekly for 8 weeks and then 22,500 units once weekly for 16 weeks. Calcium carbonate tablets 500 mg once daily were also prescribed for the initial 2 months of treatment. Measured variables were reassessed after 6 months of replacement therapy.

During the trial, subjects were instructed not to change their diabetes drugs or lifestyle. No significant association was found between vitamin D3 level and any of the measured variables apart from a significant positive correlation with blood urea nitrogen. Vitamin D3 replacement was associated with a significant increase in its level (14.0 ± 4.0 vs 31.0 ± 7.9 ng/mL, $P < 0.001$). This was associated with a significant reduction of HbA1c (7.9 ± 1.7 vs $7.4 \pm 1.2\%$, $P = 0.001$) and FPG (9.1 ± 4.3 vs 7.9 ± 2.4 mmol/L, $P = 0.034$). Mean reduction of HbA1c was 0.54% and that of FPG was 1.22 mmol/L. Fasting insulin, c-peptide and insulin resistance (IR) were reduced but this was statistically insignificant ($P = 0.069$, 0.376, 0.058, respectively). Fasting insulin decreased by 22%, HOMA-IR by 27.6%, and c-peptide by 1.83%. Total cholesterol (4.3 ± 0.9 vs 4.0 ± 0.9 mmol/L, $P = 0.036$), low-density lipoprotein cholesterol (2.5 ± 0.8 vs 2.2 ± 0.8 mmol/L, $P = 0.018$), parathyroid hormone (4.6 ± 2.1 vs 3.5 ± 1.8 pmol/L, $P = 0.001$), alkaline phosphatase (82.1 ± 26.2 vs 66.2 ± 19.5 U/L, $P < 0.001$), serum creatinine (74.6 ± 15.6 vs 70.7 ± 14.7 μ mol/L, $P = 0.047$), and pulse rate (81.6 ± 11.9 vs 77.5 ± 12.0 bpm, $P = 0.045$) significantly decreased. Triglycerides and high-density lipoprotein cholesterol, both systolic and diastolic BP, and BMI did not show significant change. The result of this study is indicating that vitamin D replenishment can improve glucose homeostasis and cholesterol profile in diabetic patients. It also indicates the high prevalence of this vitamin deficiency in both men and women.

ARTICLES INSIDE

Father's Pre-conception Vitamin D Intake Linked to Child Growth



Page 2

Breast-feeding Mothers at Lower Risk of Heart Disease, Stroke



Page 3

Children Shows Better Eating Behaviors when Supplemented with Zinc



Page 4

The goal of **Bexinfo-Nutrition** is to provide updates on the latest research, and to address important issues in nutrition and healthy eating from most reliable sources. We hope our publication will help you find practical strategies for healthy living in your daily practice.

Published by
Beximco Pharmaceuticals Ltd.
19 Dhanmondi R/A, Road No. 7
Dhaka 1205, Bangladesh
Phone: +880-2-58611001-7
Fax: +880-2-58614601
E-mail: info@bpl.net
Website: www.beximcopharma.com

To meet Vitamin-D requirement for all

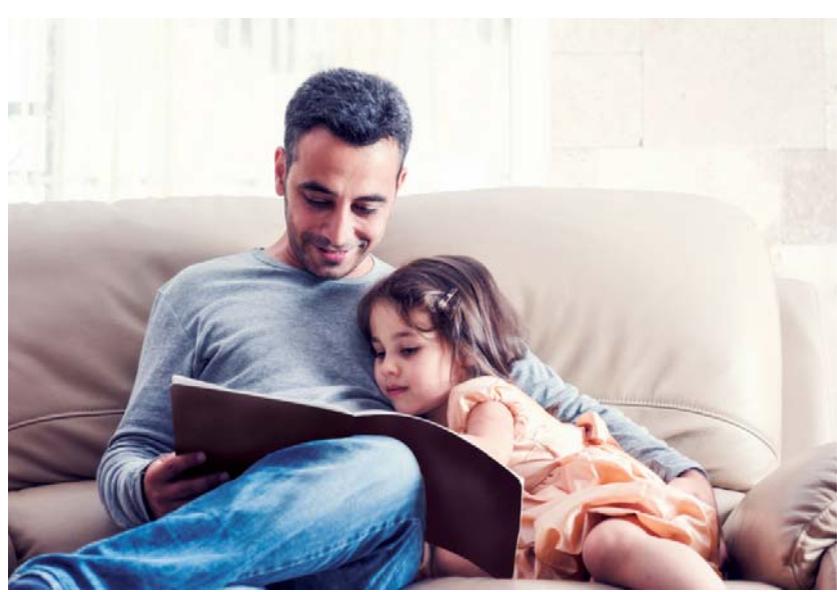
D-RISE[®]
Cholecalciferol

40000 IU Capsule
20000 IU Capsule
2000 IU Tablet

The **D-lightful**
health solution

Father's Pre-conception Vitamin D Intake Linked to Child Growth

New research shows that a father's pre-conception vitamin D intake is associated with his child's height and weight at five years old. Maternal vitamin D intake during pre-pregnancy has been found to have an important role in both offspring musculoskeletal and overall health. But whether a father's vitamin D intake during pre-conception can influence the health and development of their offspring has received little attention. This analysis investigated the prospective relationship between pre-conception paternal vitamin D intake and offspring height and weight. The researchers analyzed data from the Lifeways Cross-Generation Cohort Study -- a unique longitudinal database in Ireland. Information on paternal vitamin D intake from baseline food frequency questionnaires and children's height and weight measurements were available for 213 and 148 father-child pairs when children were aged 5 and 9 years respectively. The association between father's vitamin D intake reported during the first pre-natal trimester and the height and weight of children at age 5 and 9 was calculated using a model adjusted for several possible confounders including: paternal age, energy intake, height, weight, and being the biological father; maternal age, vitamin D and energy intake, height, and weight; and child's sex, age, vitamin D and energy intake, and summer outdoor physical activity aged five. In adjusted models, paternal vitamin D intake was positively



and statistically associated with offspring's height and weight at 5 years old; whilst these associations were reduced, and no longer statistically significant, when offspring reached 9 years old. The findings remained similar when analyses were repeated with only biological fathers. Interestingly, the findings showed no association between a mother's vitamin D intake during the first and second trimester of pregnancy and children's weight and height at either age five or nine years. Skin exposure to sunlight is essential for the body to produce vitamin D, so the authors also looked at the number of hours children aged 5 spent playing outdoors during summer. They

found that spending 3 or more hours playing outdoors during weekends was related to increased height at 5 years of age. The authors conclude, "Paternal vitamin D intake was positively and prospectively associated with offspring's height and weight at 5 years old, independent of maternal characteristics, meriting further investigation of familial dietary pathways." They add, "One reason this may occur is that father's nutrition status may somehow influence the health, quality and function of their germ cells, which are involved in reproduction. Thus, maternal nutrition may not be the only key factor in offspring's growth development and health."

New Review Shows Potential of Vitamin B3 for Preventing Melanoma

Melanoma is the fourth most common cancer in the Australian population and the fifth leading cancer in males and seventh leading cancer in females in the United States. A therapy using a form of vitamin B3 can potentially prevent melanoma—a deadly skin cancer—according to the researchers. Researchers from University of Sydney, Australia found that nicotinamide (vitamin B3) can help reduce or reverse DNA damage, inflammation and immunosuppression caused by ultraviolet radiation. Randomized placebo controlled trials are now warranted to determine its efficacy and safety for melanoma prevention, they said. Ultraviolet radiation (UVR) causes DNA damage in melanocytes by producing photolesions such as cyclobutane pyrimidine dimers and 8-oxo-7-hydrodeoxyguanosine. The production of reactive oxygen species by UVR also induces inflammatory cytokines that—together with the inherent



immunosuppressive properties of UVR—propagate carcinogenesis, researchers said. Nicotinamide enhances DNA repair, modulates the inflammatory environment produced by UVR, and reduces UV-induced immunosuppression. As nicotinamide reduces the incidence of actinic keratoses and non-

melanoma skin cancers in high-risk individuals and enhances repair of DNA damage in melanocytes, it is a promising agent for the chemoprevention of melanoma in high-risk populations. "Nicotinamide has been shown in a clinical trial—called ONTRAC—to reduce the incidence of non-melanoma skin cancer in high-risk individuals and it would be worthwhile to determine whether it would also be useful for high-risk melanoma patients," said the researchers.

To meet Vitamin-D requirement for all

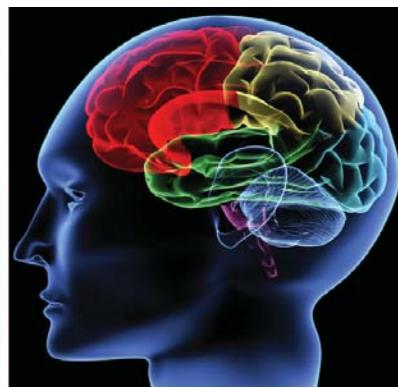
D-RISE[®]
 Cholecalciferol

40000 IU Capsule
 20000 IU Capsule
 2000 IU Tablet

The **D-lightful**
 health solution

Brain Levels of Vitamin B12 Decrease with Age and are Prematurely Low in People with Autism and Schizophrenia

A new study found that vitamin B12 levels in the brain are significantly decreased in the elderly and are much lower in individuals with autism or schizophrenia, as compared to their peers at similar ages. For example, children with autism under the age of 10 were found to have three times lower brain B12 levels, which is similar to levels for generally healthy adults in their 50s, indicating a premature decrease. The researchers analyzed tissue from otherwise healthy deceased donors along with tissue from donors who had autism or schizophrenia to make the comparisons. "These are particularly significant findings because the differences we found in brain B12 with aging, autism and schizophrenia are not seen in the blood, which is where B12 levels are usually measured," said the researchers. "The large deficits of brain B12 from individuals with autism and schizophrenia could help explain why patients suffering from these disorders experience neurological and neuropsychiatric symptoms." The study also found healthy elderly people in the age range of 61-80 have about three times lower levels of total brain B12 than younger age groups,



which is a result of normal aging. This normal decrease may help adjust brain metabolism to sustain its function across the lifespan. An active form of B12 called methylcobalamin, or methyl B12, supports normal brain development by its control through a process known as epigenetic regulation of gene expression.

Remarkably, the brain level of methyl B12 was found to be more than 10 times lower in healthy elderly people than in healthy younger people. A lower than normal level of methyl B12 in the brain could adversely affect neurodevelopment in younger years and could disrupt learning and memory later in life. Both autism and schizophrenia are associated with oxidative stress, which also plays an important role in aging, and oxidative stress may underlie the decreased brain B12 levels observed in this study. The findings suggest the need for further research to determine if the use of supplemental methyl B12 and antioxidants like glutathione could help prevent oxidative stress and be useful in treating these conditions.

Breast-feeding Mothers at Lower Risk of Heart Disease, Stroke



It is not only babies who benefit from breast-feeding; a new study finds that the practice may lower a mother's risk of heart disease and stroke. What is more, researchers found that a mother's risk of heart disease and stroke further decreased with each additional 6 months of breast-feeding. Previous studies have indicated that women who breast-feed may experience short-term reductions in blood pressure, cholesterol, and weight loss, which may benefit cardiovascular health. However, the researchers note that longer-term effects of breast-feeding on a mother's

cardiovascular health remain unclear. To get a better understanding of this association, the researchers analyzed the data of 289,573 Chinese women who were part of the China Kadoorie Biobank study. All women were free of cardiovascular disease at study baseline, and almost all of them had children. As part of the study, the women were required to provide information on their reproductive history, including whether or not they breast-fed their children and the duration of breast-feeding. The researchers also looked at the incidence of heart disease and stroke among the women over 8 years of follow-up. The team found that, overall, women who had breast-fed their children were at 9 percent lower risk of heart disease and 8 percent lower risk of stroke, compared with women who had never breast-fed. Looking at the results by breast-feeding duration, the study revealed that women who had breast-fed their children for 2 years or longer were 18 percent less likely to develop heart disease and 17 percent less likely to have a stroke, compared with non-breast-feeding mothers. For every 6 additional months of breast-feeding, the risks of heart disease and stroke were reduced by 4 percent and 3 percent, respectively. The researchers are unable to pinpoint the precise mechanisms behind their findings, but they speculate that the lower risk of heart disease and stroke among breast-feeding mothers may be down to a metabolism "reset" after pregnancy. "Pregnancy changes a woman's metabolism dramatically as she stores fat to provide the energy necessary for her baby's growth and for breast-feeding once the baby is born. Breast-feeding could eliminate the stored fat faster and more completely," the researchers explain. Furthermore, the team notes that breast-feeding mothers may be more likely to adopt health behaviors that aid their cardiovascular health, compared with non-breast-feeding mothers. While the study is observational and cannot prove cause and effect, the researchers believe that their results provide further evidence of the benefits of breast-feeding, particularly for a longer duration. "The findings should encourage more widespread breast-feeding for the benefit of the mother as well as the child," the researchers said.

To recover damaged nerves in neuropathy

 **Neurocare**[®]
 Vitamin B1, B6 & B12 tablet

"Natural care"
 for nerve regeneration

The Role of Thalassemia and Iron in Groundwater on High Prevalence of Anemia with Lack of Iron Deficiency among Women in Rural Bangladesh



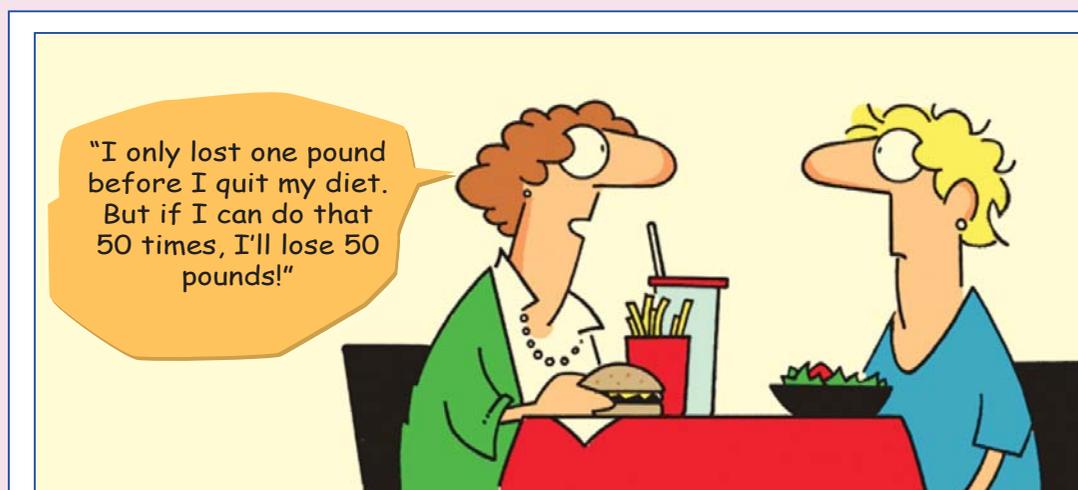
Iron deficiency was absent in a recent population assessment of rural Bangladeshi women exhibiting anemia (57%), suggesting other causes of low hemoglobin. The researchers assessed the relative influence on anemia of thalassemia, groundwater arsenic and iron, and diet among women of reproductive age living in rural Bangladesh. Women (n=207) sampled from a previous antenatal nutrient intervention trial in rural Bangladesh were visited during two seasons in 2008. Collected data included 7-day dietary and 24-hour drinking water intake recalls, 7-day morbidity recall, anthropometry, and drinking water arsenic and iron concentrations. Capillary blood was analyzed for iron (plasma ferritin, soluble transferrin receptor), inflammation (C-reactive protein) and thalassemia (β thalassemia and Hb E) status. In stratified, adjusted analyses, only parity was associated with anemia [odds ratio, OR (95% CI): 11.34 (1.94, 66.15)] for those with thalassemia (28% prevalent). In contrast, groundwater iron intake [>30 mg/d, 0.48 (0.24, 0.96)] and wasting [2.32 (1.17, 4.62)] were associated with anemia among those without thalassemia. Elevated groundwater arsenic (>50 $\mu\text{g/L}$, 12% of tubewells) and a diverse diet were unrelated to anemia regardless of thalassemia diagnosis ($P>0.70$ and >0.47 , respectively). Among women in this typical rural Bangladeshi area, the prevalence of thalassemia was high and, unlike iron deficiency which was absent most likely due to high iron intake from groundwater, contributed to the risk of anemia. In such settings, the influence of environmental sources of iron and the role of thalassemia in contributing to anemia at the population level may be underappreciated.

Children Shows Better Eating Behaviors when Supplemented with Zinc



differences in mean cumulative score changes between visits 1 and 5. The adjusted rate-of-change for these outcomes was modeled using generalized estimating equations. Mean changes in temperament scores and in eating behavior scores between visits 1 and 5 were not significant in either the zinc or non-zinc group. Children in the iron-folic acid group increased temperament scores by 0.37 points over 5 visits (95% CI 0.02, 0.7), which was not significant after adjustment. Neither the adjusted rate-of-change in temperament scores between zinc and non-zinc ($\beta = -0.03$, 95% CI $-0.3, 0.2$) or iron-folic acid and non-iron-folic acid ($\beta = 0.08$, 95% CI $-0.2, 0.3$) were significantly different. Adjusted rate of change analysis showed no significant difference between zinc and non-zinc ($\beta = -0.14$, 95% CI $-0.3, 0.04$) or between iron and non-iron eating behavior scores ($\beta = -0.11$, 95% CI $-0.3, 0.1$). Only among children with iron-deficiency anemia at baseline, there was a significant decrease in eating behavior score, indicating better eating behaviors, when supplemented with zinc ($\beta = -0.3$, 95% CI $-0.6, -0.01$). Ultimately, this effect of zinc on eating behaviors was the only effect the researchers observed after approximately one year of micronutrient supplementation.

Child eating behaviors play an important role in nutrient intake, ultimately affecting child growth and later outcomes in adulthood. The study assessed the effects of iron-folic acid and zinc supplementation on child temperament and child eating behaviors in rural Nepal. Children (N = 569) aged 4–17 months in Sarlahi district, southern Nepal were randomized to receive daily supplements of placebo, iron-folic acid, zinc, or zinc plus iron-folic acid and followed for approximately 1 year. At baseline and four follow-up visits mothers completed questionnaires including information on demographic characteristics and child temperament and eating behaviors. The main effects of zinc and iron-folic acid supplementation on temperament and eating behaviors were assessed through crude and adjusted



To fix hemoglobin level quickly

Hemofix[®] FZ
 Ferrous ascorbate + Folic acid + Zinc

...maximizes benefit, favors life