

Health Bits and Pieces (HFN 34:1)

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Allergies, Asthma, and the Gut

Changes in an infant's intestinal microbiota may help predict the future development of food allergies or asthma. A new study from researchers at the University of Alberta and University of Manitoba, Canada delves into this topic. A study published last year in *Clinical & Experimental Allergy* shows that less diversity of gut bacteria at an early age, as early as three months, can be a risk factor in developing sensitivities to eggs, milk, or peanuts by the time they reach their first birthday. Lead author and researcher Meghan Azad said "We hope to develop new ways of preventing or treating allergies, possibly by modifying the gut microbiota." The gastrointestinal tract of infants becomes colonized immediately after birth with environmental microorganisms, mainly from the mother. There is strong evidence that suggests that the early composition of an infant's microbiota plays an important role for the development of the immune system. There appears to be less diversity in the intestinal microbiota of infants born by caesarean delivery, particularly with a lack of *Bifidobacteria* species. The use of formula instead of breast milk is another factor. Breast milk is an early stimulator of the intestinal flora. Treatment with probiotics might be an option for the prevention of future health problems.

Azad M, Konya T, Guttman D, et al., "Infant gut microbiota and food sensitization: associations in the first year of life," Clinical & Experimental Allergy 2015; 45 (3): 632 DOI: 10.1111/cea.12487.

Calcium, Osteoporosis, and Diet

The National Osteoporosis Foundation has explained in a recent position paper that the positive effects of high calcium intake really only apply during developmental years, from late childhood and early teen years, which is a critical growth period and a period of maximum skeletal growth. A recent evidence review found almost no evidence of benefit to adults from calcium supplements, but a significantly higher risk of heart attacks, kidney stones, and gastrointestinal problems that can sometimes be caused or aggravated by calcium deposition. The authors of the study, which appeared in the *Journal of Internal Medicine*, wrote, "calcium supplements appear to have a negative risk-benefit effect, and so should not be used routinely in the prevention or treatment of osteoporosis." Other studies show that a diet high in fruits and vegetables promotes stronger bones.

Weaver C, Gordon C, Janz K, et al., "The National Osteoporosis Foundation's position statement on peak bone mass development and lifestyle factors: a systematic review and implementation recommendations," Osteoporosis International, 2016; Feb 8. [Epub ahead of print]; Reid I, Bristow S, Bolland M, "Calcium supplements: benefits and risks," Journal of Internal Medicine, 2015; Oct;278(4):354-68. doi: 10.1111/joim.12394. Epub 2015 Jul 14. Review; Tucker K, Hannan M, Chen H, et al., "Potassium, magnesium, and fruit and vegetable intakes are associated with greater bone mineral density in elderly men and women," American Journal of Clinical Nutrition, 1999; Apr;69(4):727-36.

Cataracts and Insomnia

Aging can cause progressive cloudiness in the crystalline lens ultimately forming cataracts and blocking shorter wavelengths. Individuals aged 70 years are estimated to have roughly 20% of the capacity for light reception to the retina compared with teenagers. Reduced light to the retina and eventually the brain can be a cause of sleep disturbance. In a study by the Nara Medical University in Japan 1,037 pensioners with cataracts, 174 of whom had had cataract surgery, were asked to wear a wristwatch-style sleep tracking device to record length and quality of sleep. The subjects who had had surgery slept significantly better and remained asleep for longer. Apparently, in removing the clouded lens, the surgery let in blue light, needed for normal triggering of sleep. Cataracts seem to prevent light from reaching the area of brain that sets the body rhythms. Studies have suggested that poor sleep is associated with increased risk of depression, dementia, cardiovascular diseases, and mortality. Cataract surgery can increase light to the brain and increase the secretion of melatonin, the pineal hormone associated with the quality of sleep. For those who want to prevent or treat cataracts nutritionally, the amino acid carnosine has been found to have a beneficial preventive and therapeutic effect.

Obayashi K , Saeki K, Miyata K, "Comparisons of Objective Sleep Quality Between Elderly Individuals With and Without Cataract Surgery: A Cross-Sectional Study of the HEIJO-KYO Cohort," Journal of Epidemiology, 2015; 25(8): 529–535. Published online 2015 Aug 5. Prepublished online 2015 Jun 6. doi: 10.2188/jea.JE20140201; Francesco Attanasio, et al., "Protective Effects of L- and D-Carnosine on alpha-Crystallin Amyloid Fibril Formation: Implications for Cataract Disease,"

Biochemistry, 2009, 48 (27), pp 6522-6531 DOI:
10.1021/bi900343n.

Oxytocin and Happiness

The hormone oxytocin is sometimes referred to as the neuropeptide of “attachment” and even the hormone of happiness. Even in animal studies oxytocin has been found to promote connection and bonding. The highest recorded levels have been measured in women who are multi-orgasmic. Its use has been suggested for treating people with social disorders caused by “disrupted attachment,” such as eye-contact disorders, social discomfort, and even schizophrenia and autism. It is also being investigated as an anti-aging treatment to protect muscle mass, breast tissue, and increase vaginal lubrication. Oxytocin might also be associated with stimulating the happiness epicenter in the brain.

Cho M, Courtney D, Williams J, Carter C, “The effects of oxytocin and vasopressin on partner preferences in males and female prairie voles (Microtus ochrogaster),” Behavioral Neuroscience, 1999; 113: 1071-1079; Carmichael M, Warburton V, Dixen J, Davidson J, “Relationships among cardiovascular, muscular and oxytocin responses during human sexual activity,” Archives of Sexual Behavior, 1994; 23(1): 59-79; Sato W, Kochiyama T, Uono S, et al., “The structural neural substrate of subjective happiness,” Science Report, 2015; 5: 16891; Vaccari C, Lolait S, Ostrowski N, “Comparative distribution of vasopressin V1b and oxytocin receptor messenger ribonucleic acids in brain,” Endocrinology, 1998; 139(12): 5015-5033.

Artificial Sweeteners and Diabetes

Researchers in Israel have studied how artificial sweeteners change the human microbiome, the diverse

collection of microbial colonies that populate, among many other areas, your gut. Recent research shows how gut bacteria have a wide-ranging influence, on the digestive system, metabolism, the immune system, and even mood and brain function. After only one week, mice given artificially sweetened water developed a pronounced intolerance to glucose, compared to sugar water, which caused no apparent harm. They found that artificial sweeteners had changed the animals' microbiomes to a considerable degree. Next they conducted two tests in humans and found that in 381 non-diabetic volunteers there was a connection between the use of any kind of artificial sweetener and signs of glucose intolerance. The composition of the gut bacteria of the participants who used artificial sweeteners was different from those who did not. In other experiments they confirmed that changes in the microbiome caused by artificial sweeteners were the cause of glucose intolerance. The glucose intolerance went away when the researchers used antibiotics to kill off the gut flora. Also, when they injected gut bacteria from humans who had used artificial sweeteners into the intestines of mice, the animals developed glucose intolerance.

Suez J, Korem T, Zilberman-Schapira G, Segal E, Elinav E, "Non-caloric artificial sweeteners and the microbiome: findings and challenges," Gut Microbes 2015;6(2):149-55. doi: 10.1080/19490976.2015.1017700. Epub 2015 Apr 1. Review; Suez J, Korem T, Zeevi D, Zilberman-Schapira G, et al., "Artificial sweeteners induce glucose intolerance by altering the gut microbiota," Nature 2014 Oct 9;514(7521):181-6. doi: 10.1038/nature13793. Epub 2014 Sep 17.

