

Researchers discover additional benefit of vitamin A

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Vitamin A is critical to maternal health and child survival, yet in most developing countries Vitamin A deficiency is a leading cause of blindness and increased child mortality. The Johns Hopkins Bloomberg School of Public Health has long been a leader in vitamin A research, and scientists at the School recently discovered a link between offspring lung function and maternal vitamin A supplementation. The results are published in the May 13, 2010, issue of the *New England Journal of Medicine*.

"Children of mothers who received [vitamin A](#) supplementation before, during and after pregnancy had significantly improved [lung function](#) when compared to those whose mothers received beta-carotene supplementation or placebo," said lead author of the study, William Checkley, MD, PhD, assistant professor in the Division of Pulmonary and Critical Care of the Johns Hopkins School of Medicine with a joint appointment in the Bloomberg School's Department of International Health. "Lung function of offspring in mothers who received maternal vitamin A supplementation improved by about 40 ml versus those whose mothers received a placebo. This represents an approximately 3 percent increase in lung function. Furthermore, the magnitude of effect observed in this study is slightly greater than that associated with preventing exposure to parental smoking in school-age children."

Vitamin A deficiency affects nearly 190 million preschool-age children worldwide and is the underlying cause of 650,000 early childhood deaths annually. To examine the effect of antenatal vitamin A supplementation

on lung function, researchers revisited a cohort of children ages 9 to 13 in rural Nepal whose mothers were randomized to receive vitamin A, beta-carotene or a placebo. Using a portable pneumatochometer, offspring lung function was measured. They found that children whose mothers received vitamin A instead of a placebo had a significantly greater forced expiratory volume at one second (FEV1) and a greater forced vital capacity (FVC), while children whose mothers received beta-carotene instead of a placebo had similar FEV and FVC.

"Improved lung function was likely specific to supplementation received in utero because this population of children was subsequently exposed beyond six months of age to semiannual vitamin A supplementation with high coverage as part of a national program during their preschool years," said Keith West, DrPH, MPH, George G. Graham Professor in Infant and Child Nutrition in the Bloomberg School's Department of International Health. "This benefit was limited to children whose mothers received vitamin A and not to those whose mothers received beta-carotene. Early interventions with vitamin A in communities where undernutrition is highly prevalent may have long-lasting consequences in lung health."

Vitamin A was first discovered in 1913 by E.V. McCollum, the founding chair of the School's Department of Chemical Hygiene, now Biochemistry and Molecular Biology. It was one of the first essential micronutrients to be identified. In the 1970s, Alfred Sommer, MD, MHS, dean emeritus at the Bloomberg School of Public Health, and colleagues discovered the link between [vitamin A deficiency](#) and night blindness among [children](#) in rural Indonesia and found that vitamin A given twice a year reduced childhood mortality by a third. The World Bank declared vitamin A supplementation as one of the most cost-effective medical interventions of all time.

More information: "Maternal Vitamin A Supplementation Before,

"During and After Pregnancy Improves Lung Function in Preadolescent Offspring" was written by William Checkley, Keith P West Jr., Robert A Wise, Matthew R Baldwin, Steven C LeClerq, Parul Christian, Joanne Katz, James Tielsch, Subarna Kharty and Alfred Sommer.

Provided by Johns Hopkins University Bloomberg School of Public Health

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