

Preterm labor powerhouse therapy offers promise for inflammatory diseases

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Magnesium sulfate is given to many pregnant women to treat preterm labor and preeclampsia and was recently shown to prevent cerebral palsy; however little is known about how it works. Researchers at Case Western Reserve University School of Medicine recently discovered the mechanism by which magnesium reduces the production of cytokines. Cytokines are molecules responsible for regulating inflammation; they play a key role conditions, such as diabetes, obesity, atherosclerosis, asthma, and alcoholic liver disease and cirrhosis. Although the study related to pregnancy, inflammation is the culprit of many conditions and learning more about individual's magnesium levels may help a much broader patient population.

In a study published in The [Journal of Immunology](#), the laboratories of Helene Bernstein, MD, PhD, and Andrea Romani, MD, PhD, reported that magnesium decreases inflammation by reducing the activity of cells' primary protein, [Nuclear Factor](#) Kappa Beta (NF-kB), and the subsequent production of cytokines. This new insight offers a promising new immunotherapeutic strategy by which a simple nutrient, known to be safe based on its extensive usage in obstetric settings, can decrease inflammation in diseases other than pregnancy, including in other sepsis, [respiratory distress syndrome](#), asthma, atherosclerosis, diabetes and cancer. The cost of all of these diseases in the United States exceeds \$200 billion annually.

"We really didn't understand how or why magnesium worked, which was frustrating for both physicians and patients. As cytokines levels at birth

are the strongest predictor of cerebral palsy and are associated with preterm birth, we asked whether magnesium influences cytokine production. The concept that such a small molecule decreases inflammation is exciting and relevant to other diseases. Now that we understand how magnesium functions, we can figure out how to make it work even better," says Dr. Bernstein, associate professor of [reproductive biology](#) and [molecular biology](#) and microbiology, Case Western Reserve School of Medicine, OB/GYN at University Hospitals MacDonald Women's Hospital, and senior author of the study.

The physician-scientists are now examining how magnesium could be used therapeutically, looking at factors including dosage, timing, frequency, and delivery method. Further research is needed to pinpoint [magnesium sulfate](#)'s broader applicability.

"The last decade has registered an incredible progress in understanding the basics of magnesium homeostasis both at the cellular and whole body level. Yet, a significant gap still exists when our knowledge about magnesium is compared to that of calcium, sodium, potassium, or hydrogen. As efforts continue to elucidate magnesium regulation and effects, more effective 'therapeutic approaches' will become applicable to patient health care," says Andrea Romani, MD, PhD, associate professor of physiology and biophysics, Case Western Reserve School of Medicine and first author of the study.

Provided by Case Western Reserve University

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