

Lower risk of brain injury for at-risk infants whose mothers consumed pomegranate juice

March 11 2021



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Intrauterine growth restriction (IUGR) is common and concerning, but few therapeutic options exist for pregnant mothers who receive this diagnosis. IUGR is a condition in which a baby in the womb is

measuring small for its gestational age, often because of issues with the placenta, resulting in compromised or insufficient transfer of oxygen and nutrients to the growing fetus. The developing fetal brain is particularly vulnerable to these effects. One out of every 10 babies is diagnosed with IUGR, and infants with IUGR are at increased risk of death and neurodevelopmental impairment.

Recent research on polyphenol-rich [pomegranate juice](#) has suggested that it may help protect the brain from [injury](#). In an exploratory, randomized, controlled clinical trial, supported by philanthropic funding and a gift from POM Wonderful, the largest grower and producer of fresh pomegranates and [pomegranate](#) juice in the United States, investigators at Brigham and Women's Hospital enrolled pregnant mothers whose [infants](#) were diagnosed with IUGR. The team found evidence that drinking pomegranate juice daily may reduce risk of brain injury in IUGR infants, especially during the third trimester when the infant brain may be particularly vulnerable. Findings are published in *Scientific Reports*.

"There are dietary factors that may influence neuroprotection, especially in high-risk settings such as during labor and delivery," said co-author Terrie Inder, MBCHB, chair of the Department of Pediatric Newborn Medicine at the Brigham. "We were intrigued by findings from preclinical research suggesting that polyphenols, which are found at high concentrations in pomegranate juice, might be highly protective. Our clinical trial provides the most promising evidence to date that polyphenols may provide protection from risk of brain injury in IUGR infants."

"While exploratory, our results are promising and suggest that being able to intervene before birth may aid in protecting the newborn brain from the devastating effects of brain injury," said corresponding author Lillian G. Matthews, Ph.D., a neuroscientist at Monash Biomedical Imaging and

Turner Institute for Brain and Mental Health in Australia. Prior to joining Monash, Matthews was at Harvard Medical School and the Brigham in the Department of Pediatric and Newborn Medicine, where she maintains a current affiliation.

Polyphenols are part of a class of antioxidants found in certain foods and beverages, including almonds, berries, red wine and teas. Pomegranate juice is a particularly rich source of these molecules. Polyphenols are known to cross the blood-brain barrier, and studies in animal models have demonstrated protective effects against neurodegenerative diseases.

For their clinical trial, Inder and colleagues recruited 99 [pregnant mothers](#) at the Brigham. The participants were randomly assigned to consume either 8 ounces of pomegranate juice or a polyphenol-free beverage matched for color, taste and calorie-count. Participants drank the juice daily from the time of enrollment until delivery.

The team performed fetal MRI measurements on approximately half of the participants prior to mothers starting the juice regimen and found no evidence of [fetal brain](#) injury at that time. After delivery, neonatal MRI measurements showed that infants whose mothers consumed pomegranate juice were less likely to have brain injury compared to those randomized to placebo. Infants had lower risk of cortical gray matter injury and white matter injury. The team also found no evidence of ductal constriction, a potential safety concern.

Given the exploratory nature of the study and its limited size, the authors caution that larger controlled trials are needed. The team also plans to continue studying infants enrolled in their study over the next 2-3 years to assess the infants' neurodevelopmental outcome.

"Our neurodevelopmental follow-up studies are ongoing, and we encourage other investigators studying high-risk infant populations to

consider the influence of polyphenols for neuroprotection," said Inder. "My dream is that we will one day be able to offer women a way to help shield their infant's [brain](#) from potential injury. In the meantime, we'll continue to follow participants to provide further insight into the potential clinical implications of prenatal pomegranate [juice](#)."

More information: Madeline M. Ross et al, A randomized controlled trial investigating the impact of maternal dietary supplementation with pomegranate juice on brain injury in infants with IUGR, *Scientific Reports* (2021). [DOI: 10.1038/s41598-021-82144-0](https://doi.org/10.1038/s41598-021-82144-0)

Provided by Brigham and Women's Hospital

Citation: Lower risk of brain injury for at-risk infants whose mothers consumed pomegranate juice (2021, March 11) retrieved 29 January 2024 from <https://medicalxpress.com/news/2021-03-brain-injury-at-risk-infants-mothers.html>

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