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Agreement between fetal brain ultrasonography and magnetic resonance imaging in the measurements of the corpus callosum and transverse cerebellar diameter

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As the use of magnetic resonance imaging of the fetal brain has evolved, the need to understand its efficiency in the biometry of the fetal brain has broadened. This study aimed to assess the level of agreement and correlation between the two cardinal imaging methods of fetal neuroimaging, ultrasonography (US) and magnetic resonance imaging (MRI), by measuring the corpus callosum (CC) and transverse cerebellar diameter (TCD) in terms of length and percentile. Measurements of CC and TCD length and percentile were documented over a 7-year span in a tertiary referral medical center. All US and MRI examinations were performed in the customary planes and subcategorized by valid reference charts. Exclusion and inclusion criteria were set before the collection and processing of the data. A total of 156 fetuses out of 483 were included in the study. A positive, strong correlation and agreement were found (r = 0.78; ICC = 0.76) between US and MRI in TCD measurements. For CC length measurement, a moderate correlation and moderate agreement (r = 0.51; ICC = 0.49) between US and MRI was observed. TCD and CC percentiles had lower levels of correlation and agreement compared with the length variables. Our study indicates good agreement between MRI and US in the assessment of TCD measurement as a part of antenatal neuroimaging. Furthermore, while the two techniques are not always compatible, they are complementary methods.

Keywords: MRI; cerebellum; corpus callosum; fetal brain; neurodevelopment

Biography

Eldad Katorza MD, MSc, MBA Director of the Gertner Institute for Epidemiology & Health Policy Research at Sheba Medial Center, and Director of Arrow Program for Medical Research Education. Prof. Katorza is a specialist in Fetal Imaging & MRI, and serves as senior physician at the OB/GYN and Diagnostic Imaging Divisions, and head of the multidisciplinary team at the Fetal Neurology Clinic at Sheba Medical Center. He received his MD (2002) from the Faculty of Medicine, Ben-Gurion University of the Negev including an MA in clinical research. He went on to complete a residency in Obstetrics and Gynecology (2008) at Sheba Medical Center and a fellowship in Fetal MRI and Imaging of the fetal central nervous system and brain at the Hôpital Armand Trousseau, Paris. Prof. Katorza holds an MBA (2018) from Coller School of Management, Tel Aviv University. He went on to complete a residency in Medical Management (2022) at Sheba Medical & the israeli Ministry of Health.