

Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th June - 2024

ISSN: 2835-396X

Website: econferenceseries.com

MIDDLE CEREBRAL ARTERY AND UMBILICAL ARTERY, PULSATILITY INDEX DOPPLER ASSOCIATIONS WITH PREGNANCY RISK

Azimova Karomatposhsho Ahmadzoda

Assistant of the Department of Obesterics and
Gynecology of Ferghana Public Health Medical Institute

Annotation

Doppler velocimetry of the middle cerebral artery (MCA) is a method to assess impedance/resistance to flow in the fetal brain circulation. Vasodilatation of the MCA is considered to reflect a compensatory phenomenon often referred to as the “brain sparing effect”.

Keywords: Doppler ultrasonography, Fetal hypoxemia, umbilical artery (UA), middle cerebral artery (MCA), pulsatility index (PI).

One of the most important applications of Doppler ultrasonography in obstetrics is the detection of fetal anemia in pregnancies complicated by either red-cell alloimmunization or by other causes of fetal anemia. Fetal hypoxemia is associated with increased impedance to flow in the umbilical artery (UA) and decreased impedance in the fetal middle cerebral artery (MCA). Consequently, Doppler measurement of UA and MCA pulsatility index (PI) plays a central role in the assessment and monitoring for fetal oxygenation in pregnancies with impaired placentation. Most studies have investigated the use of UA PI and MCA PI in pregnancies with small for gestational age (SGA) fetuses with the aims of firstly, distinguishing between those which are constitutionally small from those that are growth restricted and therefore at increased risk of perinatal death and long-term neurological morbidity and secondly, deciding the best time, place and mode of delivery. Recent evidence suggests that high UA PI and low MCA PI, regardless of fetal size, is independently associated with intrapartum fetal compromise, low neonatal blood pH and neonatal unit admission. Consequently, measurement of MCA PI, UA PI and their ratio (cerebroplacental ratio or CPR), are widely used as part of routine third-trimester assessment of fetal wellbeing and screening for fetal hypoxemia.



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th June - 2024

ISSN: 2835-396X

Website: econferenceseries.com

Middle Cerebral Artery

Angle-independent indices differ among the different cerebral arteries. The middle cerebral artery is the most studied cerebral artery because it is easy to sample, it provides information on the cerebral blood flow in normal and IUGR fetuses, and it can be sampled at an angle of 0° between the ultrasound beam and the direction of the blood flow. Therefore, for the middle cerebral artery we are able to determine angle-independent indices (the most used is the pulsatility index).

Umbilical artery

Umbilical artery doppler assessment provides information about increased vascular resistance, allowing for the identification of high-risk pregnancies. The umbilical cord of a fetus can be easily seen in the second and third trimesters and is routinely assessed. In addition, umbilical artery Doppler assessment can be done in both the second- and third-trimester ultrasound exams. This evaluation can provide information on fetal placental and cardiovascular function based on blood flow resistance. It is a non-invasive method of studying hemodynamic patterns to determine fetal well-being. This is especially important in any fetus with known or suspected intrauterine growth restriction (IUGR) or cord compression from a nuchal cord or knots. When it comes to umbilical artery Doppler assessment, the first thing to know is that blood flow through the umbilical artery can vary due to fetal heart rate, fetal movement, maternal breathing, and the location of the sampling site. For this reason, it is ideal to obtain Doppler tracings when the fetus is not active, and if needed, with suspended maternal breathing.

To evaluate the role of the middle cerebral artery (MCA) to the umbilical artery (UA) blood velocity waveform's pulsatility index (PI) screening in proximity to delivery as a predictor of high-risk pregnancy and neonatal outcomes. The study used a nested case-control method, consisting of 24 women with high-risk pregnancies and 24 pregnant women who were classified as normal. The MCA/UA PI ratio was evaluated within 14 days before delivery. All subjects newborns were evaluated for neonatal outcomes, which included fetal distress, abnormal cardiotocography or fetal heart rate patterns, neonatal mortality, Apgar score, duration of hospitalization, and neonatal intensive care unit (NICU) admission. A cutoff point for MCA/UA PI ratio was assessed using the receiver operating characteristic curve. The correlations between the MCA/UA PI ratio and high-risk



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th June - 2024

ISSN: 2835-396X

Website: econferenceseries.com

pregnancy and neonatal outcomes were assessed with multivariable linear regression based on the cutoff point obtained.

Results: the MCA/UA PI ratio in high-risk pregnancy was significantly lower compared with normal pregnancy ($p = .011$). The MCA/UA PI ratio of ≤ 1.32 finding was 6.37 times higher in high-risk pregnancy ($p = .017$, AOR 6.37, 95% CI 1.40–28.97), 5.9 times higher in pregnancy with the neonate's first-minute Apgar less than 7 ($p = .031$, AOR 5.90, 95% CI 1.18–29.61), and 18.62 times higher in neonates admitted to the NICU ($p = .023$, AOR 18.62, 95% CI 1.43–2702.94).

References:

1. Karomatposhsho, A. (2023). UTILITY-GRADE OF PHYSICIST PARAMETERS AT 36–42 WEEKS' MATURATION IN THE PROGNOSTICATION OF ANTAGONISTIC PERINATAL AFTER-EFFECTS IN APPROPRIATE-FOR-GESTATIONAL-AGE FOETUSES. *World Bulletin of Public Health*, 29, 46-56.
2. Маматханова, Г. (2021). Оптимизация медицинской учетной документации и внедрение электронных систем в здравоохранение. *Общество и инновации*, 2(8/S), 61-67.
3. Маматханова, Г. М., & Шерматова, Г. Т. (2021). Оптимизация медицинской учетной документации и автоматизация отчетностей.
4. Маматханова, Г. М., & Ашурова, М. Д. (2020). КОМПЛЕКСНАЯ ОЦЕНКА ДЕЙСТВУЮЩЕЙ ЭЛЕКТРОННОЙ БАЗЫ ПЕРВИЧНЫХ УЧЕТНО-ОТЧЕТНЫХ МЕДИЦИНСКИХ ДОКУМЕНТАЦИЙ В УЧРЕЖДЕНИЯХ ПЕРВИЧНОГО ЗВЕНА ЗДРАВООХРАНЕНИЯ. *Экономика и социум*, 2 (69), 506-512.
5. Исмаилов, С. И., & Маматханова, Г. М. (2022). ЭЛЕКТРОННЫЙ ДОКУМЕНТООБОРОТ КАК ВАЖНЕЙШИЙ ФАКТОР ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ УПРАВЛЕНИЯ ЗДРАВООХРАНЕНИЕМ. *Евразийский журнал медицинских и естественных наук*, 2(8), 38-45.
6. Mamatkhanova, G. M., & Ismailov, S. I. (2021). Optimization Of Medical Records And Implementation Of Electronic Systems In Healthcare. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(01), 193-198.



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th June - 2024

ISSN: 2835-396X

Website: econferenceseries.com

7. Ismailov, D. (2024). PATHOPHYSIOLOGY OF COMPLICATIONS OF TYPE 1 DIABETES MELLITUS. Академические исследования в современной науке, 3(5), 153-156.
8. Ismailov, D. (2024). COMPLICATIONS OF TYPE 1 DIABETES. Академические исследования в современной науке, 3(5), 157-160.
9. Solijon o'g'li, A. S. (2024, May). Measles in Children, its Symptoms and Treatment. In International Congress on Biological, Physical And Chemical Studies (ITALY) (pp. 102-106).
10. Solijon o'g'li, A. S. (2024). Antibiotic Therapy for Severe Infections in Infants and Children. Innovative Society: Problems, Analysis and Development Prospects (Spain), 6, 21-24.
11. Solijon o'g'li, A. S. (2024). Infectious Diseases in Children. Web of Semantics: Journal of Interdisciplinary Science, 2(5), 289-393.
12. Solijon o'g'li, A. S. (2024, May). Diarrhoea in Children, Causes and Symptoms. In Interdisciplinary Conference of Young Scholars in Social Sciences (USA) (Vol. 7, pp. 12-15).
13. Solijon o'g'li, A. S. (2024). BACTERIAL, VIRAL AND MUCOPLASMA PNEUMONIA IN CHILDREN. American Journal of Pediatric Medicine and Health Sciences (2993-2149), 2(1), 273-280.
14. Абдукадилова, Л. К., & Абдуллаева, Ў. Я. (2019). Тошкент шаҳри кичик ёшдаги болалар тарбияланаётган оилаларнинг ижтимоий-гигиеник ҳолатини ўрганиш натижалари. Интернаука, (5-2), 47-48.
15. Jasim, S. A., Mohammadi, M. J., Patra, I., Jalil, A. T., Taherian, M., Abdullaeva, U. Y., ... & Alborzi, M. (2024). The effect of microorganisms (bacteria and fungi) in dust storm on human health. Reviews on Environmental Health, 39(1), 65-75.
16. Каримова, М. М., Содиков, Ю. Т., Юсупова, М. М., & Мухаммадсодиков, М. М. (2022). Covid-19 o'tkazgan bemorlarda qalqonsimon bez xolatini taxlil qilish. Журнал кардиореспираторных исследований, 3(1).
17. Shukhratjonovich, S. E. (2023). TREATMENT OF PATIENTS WITH CHRONIC RECURRENT CYSTITIS WITH A DRUG BASED ON BACTERIOPHAGES. Best Journal of Innovation in Science, Research and Development, 2(10), 541-544.



Proceedings of International Educators Conference

Hosted online from Rome, Italy.

Date: 25th June - 2024

ISSN: 2835-396X

Website: econferenceseries.com

18. Shukhratjon, S. E. (2023). UROLITHIASIS DISEASE. World Bulletin of Public Health, 27, 35-36.

19. Rapikov, I. (2023). Formation of savings and entrepreneurship on the basis of labor education according to age characteristics in primary school students. Procedia of Engineering and Medical Sciences, 8(12), 80-83.

20. Анварова, З. (2024). СПИД/ВИЧ ИФИЦИРОВАНИЕ И ДЕТИ. THEORY AND ANALYTICAL ASPECTS OF RECENT RESEARCH, 2(22), 41-45.

21. Анварова, З. (2024). ЗАДЕРЖКА ВНУТРИУТРОБНОГО РАЗВИТИЯ ПЛОДА КАК ФАКТОР НАРУШЕНИЯ ГАРМОНИЧНОГО РАЗВИТИЯ ДЕТЕЙ. THEORY AND ANALYTICAL ASPECTS OF RECENT RESEARCH, 2(21), 234-237.

22. Zakhridinovich, I. B. (2024). SOME NEUROLOGICAL DISEASES IN CHILDREN. Miasto Przyszłości, 48, 162-169.



E- Conference Series

Open Access | Peer Reviewed | Conference Proceedings



E- CONFERENCE
SERIES