Thoughts on Marked Variability

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As many of you familiar with both the Clark and Shield's algorithms for Category 2 are aware, marked variability has been equated with the same interpretation of moderate variability in both of these algorithms.

I have always had my doubts, primarily because of the historical paucity of evidence related to marked variability, the lack of a clear physiologic basis, and the possibility of marked variability being caused by issues with autonomic control of the FHR during hypoxemia.

In a 2022 prospective cohort study (Level II evidence), Loussert and colleagues found a nearly three-fold increase (RR 2.70) of neonatal acidosis in infants with marked variability. The adjusted relative risk (aRR), after taking into consideration confounding factors, was still significant at 2.30.

Other interesting findings included the presence of marked variability being seen more often in nulliparas, labor induction, and assisted vaginal deliveries. FHR tracings with marked variability also had a higher incidence of recurrent variable decelerations and less incidence of recurrent late decelerations. Respiratory distress was seen in 14.7% of newborns with marked variability in FHR tracings versus 7.9% of newborns without a history of marked variability (aRR 1.73).

I am currently sharing this information in all my advanced fetal monitoring classes and suggesting we no longer equate marked variability with moderate for purposes of intrapartum management of Category 2 tracings. I encourage you to share this information with colleagues and to individualize care for patients with marked variability of the baseline in intrapartum FHR tracings. The days of simply assuming marked variability is a completely benign finding are over.

If you are interested in reading further, here are two open access articles that are a good place to start your inquiry:

1. Loussert L, Berveiller P, Magadoux A, Allouche M, Vayssiere C, Garabedian C, Guerby P. Association between marked fetal heart rate variability and neonatal acidosis: A prospective cohort study. BJOG. 2023 Mar;130(4):407-414. Available here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10108100/
2. Tarvonen MJ, Lear CA, Andersson S, Gunn AJ, Teramo KA. Increased variability of fetal heart rate during labour: a review of preclinical and clinical studies. BJOG. 2022 Nov;129(12):2070-2081. Available here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9796294/

About Lisa Miller

Lisa Miller, CNM, JD, is a registered nurse and certified nurse-midwife with more than 40 years of clinical experience in a wide variety of clinical settings. An attorney since 1990, her legal background gives her a unique understanding of the impact of law on medicine and nursing.

She served as Clinical Instructor for the University of Illinois College of Medicine in Champaign-Urbana and as an Assistant Professor in Obstetrics and Gynecology at Northwestern University Medical School in Chicago, where she directed an academic midwifery service. Additionally, she is an experienced advisor, innovator, expert witness, and the published author in the areas of EFM, obstetrics, patient safety, and legal issues.

Lisa is also partnering with AWHONN to present fully accredited training sessions to advance knowledge and learning for nurses and medical professionals. Learn more at AWHONN.org.

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