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Development, validation, and diagnostic accuracy of the fetal lack of responsiveness scale for diagnosis of severe perinatal hypoxia

Abstract:

Background: There are limitations to predicting perinatal asphyxia, as current tools rely almost entirely on fetal cardiotocography (CTG). The fetal lack of responsiveness scale (FLORS) is a new diagnostic alternative based on the physiological phenomena associated with fetal hypoxia.

Objectives: The objective of this study was to develop, validate, and assess the diagnostic accuracy of the FLORS for predicting severe perinatal hypoxia (SPH).

Study Design: A two-phase retrospective observational cross-sectional analytical study was conducted. Phase 1 involved the formulation and retrospective validation of the FLORS. A total of 366 fetal CTG records were evaluated twice by seven readers. Phase 2 was a collaborative, retrospective, multicenter diagnostic test study that included 37 SPH and 366 non-SPH cases.

Results: Phase 1: A numeric, physiology-based scale was developed and refined based on expert opinions. The median time to apply the scale per reading was 38 s. Cronbach's alpha, which is a reliability measure, was significant ($p = 0.784$). The kappa index for test-retest agreement was moderate to reasonable, with a median value of 0.642. For interobserver agreement, the kappa index per variable was as follows: baseline, 0.669; accelerations, 0.658; variability, 0.467; late/variable decelerations, 0.638; slow response decelerations, 0.617; and trend to change, 0.423. Phase 2, including 37 SPH and 366 non-SPH cases, showed a sensitivity of 62.2% and specificity of 75.4% for the 2-point score, whereas the 3-point score had a sensitivity of 35.1% and specificity of 89.9%. The area under the curve (AUC) was significant at 0.73 (CI 0.645-0.818).

Conclusions: FLORS demonstrated significant internal consistency and observer agreement, with a promising sensitivity-specificity balance and significant AUC. Further research is needed to assess its impact on perinatal hypoxia and cesarean delivery.

Biography

A specialist in Gynecology and Obstetrics with a Master's degree in Epidemiology, the author has published a book on gynecological infections and numerous academic articles. With over six years of research experience in fetal surveillance, their expertise lies in intrapartum fetal monitoring, contributing to advancements in knowledge and clinical practices for improved maternal and fetal outcomes.