Alterations of the Short-Term Variation of the Fetal Heart Rate after Antenatal Maternal Betamethasone Administration: Validation with Two Different Computational Algorithms

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Introduction  An effective measure to reduce prematurity associated neonatal mortality and morbidity is antenatal betamethasone administration to enhance fetal lung maturity. As already demonstrated, corticosteroid administration has a significant effect on the STV, because it leads to transiently increased STV within the first 24 h followed by transiently reduced STV until the first 72 h. The STV depends on the computational algorithm used. In the widely used Dawes-Redman algorithm, the STV is measured by dividing each minute into 16 segments (STV16). A new algorithm has been developed by Philips, which measures the STV by dividing each minute into 240 segments (STV240). Our aim was to validate if the known effects of the RDS prophylaxis on the STV can be demonstrated with the use of both algorithms.

Materials and Methods  This is a subanalysis of a larger, single-centre, prospective, observational study of normal pregnancies conducted in our department. We studied the effects of the RDS prophylaxis on the STV240 and STV16. In total, we gathered 285 CTGs from 101 pregnancies starting from 24.0 until 33.6 weeks of gestation, and we subsequently analysed them with both algorithms (STV240 and STV16).

Results  When compared to the STV240 and STV16 without or at least 72 h after the first intramuscular corticosteroid administration, a transient increase of both the STV240 and STV16 was documented in the first 24 h. This was followed by a transient decrease of both the STV240 and STV16 between 24 h and 72 h after the first intramuscular corticosteroid injection. These transient changes of both the STV240 and STV16 over time are statistically significant (p = 0.0100 and p = 0.0139 respectively, Kruskal-Wallis test).

Conclusion  Our results indicate that the RDS prophylaxis has a transient but significant effect on the STV. These findings are in accordance with the existing literature and stress once again the fact that a decreased STV within the first 72 h after corticosteroid administration should not be an indication for early delivery.