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AOGS LETTER TO THE EDITOR

Biphasic ST should not be omitted from STAN clinical guidelines

Sir,

We read with interest the study of Becker et al. on the added predictive value of biphasic events in ST analysis (STAN) (1). The authors used the cardiotocography (CTG) arm of the Swedish randomized controlled trial where STAN was recorded, but blinded for the clinician. Cases with Biphasic ST and concomitant CTG abnormalities indicating intervention were compared with all remaining cases without Biphasic ST. The authors concluded that the presence of significant biphasic events did not discriminate in the prediction of interventions for fetal distress or adverse outcome and therefore should be omitted from clinical guidelines if future studies confirm their findings.

In our opinion the "added predictive value" investigated by the authors is clinically irrelevant. Biphasic ST is not an additional tool, but an integral part of the STAN clinical guidelines *equal* and *parallel* to baseline T/QRS changes (baseline or episodic T/QRS rise). The aim of fetal monitoring is to discriminate fetuses threatened by intrapartum hypoxia from those that are tolerating labor well. To test the predictive ability of Biphasic ST for intrapartum hypoxia the reference group should consist of fetuses that – according to the STAN clinical guidelines – did not have an indication for intervention for fetal distress. However, the control group in the study comprises deliveries:

1. without an indication of fetal hypoxia according to STAN clinical guidelines and no intervention for fetal distress due to CTG abnormalities
2. without indication of fetal hypoxia according to STAN clinical guidelines, but intervention for fetal distress (due to CTG abnormalities and/or abnormal fetal scalp blood sampling)
3. with an indication to intervene according to T/QRS baseline changes and with imminent spontaneous delivery (no necessity to intervene)
4. with an indication to intervene according to T/QRS baseline changes and with an operative intervention and
5. with an indication to intervene according to T/QRS baseline changes and with a delayed operative intervention or no intervention.

Only group 1 mentioned above represents a control group that is meaningful for the test of the clinical value of Biphasic ST. The inclusion of groups 2 to 5 make this a control group to a heterogeneous population with and without signs of intrapartum hypoxia. The lack of predictive ability of significant Biphasic ST may therefore be a result of a wrongly selected control group. The selection of controls, as described for group 1, may result in a different conclusion (2).

Furthermore, the authors have not reported the time interval between the occurrence of significant Biphasic ST and delivery, which will modify the risk of adverse outcome.

All the randomized controlled trials concerning STAN included Biphasic ST as part of the guidelines for intervention. A revision of those should be done with extreme caution.

As experienced clinical users of STAN, we are well aware of the complexity of Biphasic ST, which were introduced into clinical guidelines mainly based on animal studies (3,4). Apart from intrapartum hypoxia, Biphasic ST may be associated with morbidities such as: cardiomyopathy, congenital heart defects, immature myocardium and fetal growth restriction. Instead of suggesting the omission of physiologically relevant information, we should rather put effort into a refinement of STAN clinical guidelines – including Biphasic ST.

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