

# Amendments in electronic fetal monitoring and intermittent auscultation

Confusion over terminology and disagreement about the best methods make fetal monitoring a controversial topic. Shashikant L Sholapurkar argues that current guidelines may not be robust and that midwives should take an active role in debating and bringing about reforms.

Interpretation of cardiotocography (CTG) remains a controversial topic, despite attempts by the national professional bodies to standardise the terminology and decision-making systems. The National Institute for Health and Care Excellence (NICE, 2014) had the difficult and unenviable task of formulating guidelines given the dearth of good-quality evidence. In some ways, it would be better to have a separate guideline for intrapartum fetal monitoring—as in many other countries—because it is a major specialist subject in itself. This would allow many more specialists with a focused, specific interest and expertise in CTG to be on the panel.

Midwives are, of course, at the frontline of CTG interpretation and intermittent auscultation of fetal heart rate (FHR) during labour—hence they bear the brunt of any major changes and shortcomings of the guidelines. Their CTG interpretation practice has come under increasing scrutiny and regulation, making it one of the leading causes of strain and pressure of the job. Not only do different countries have varying 3-tier systems of CTG interpretation and recommendations, the UK guidelines have themselves undergone significant change (NICE, 2007; 2014). It is worth considering the validity of these changes, implications for midwives and whether

midwives should take a more active role in influencing changes in future. British midwives have always been trained to interpret a combination of different FHR parameters in the context of the clinical picture and risk factors, but this remains a complex judgement. This commentary will focus on the interpretation of FHR decelerations (considered centre-stage) on CTG and intermittent auscultation, where there have been amendments in recent years (NICE, 2014).

## Changes in CTG interpretation

FHR decelerations are the most common and significant aberrations on the CTG in labour, so their categorisation and interpretation seems most important, irrespective of which 3-tier system of CTG classification is used. Between 2007 and 2015, 'atypical variable decelerations' became the most common finding responsible for classifying CTGs as suspicious or pathological (Sholapurkar, 2013a). However, the high number of false positive pathological CTGs was leading to dysfunctional CTG interpretation and false-alarm fatigue (Sholapurkar, 2013a). The latest NICE (2014) guidelines made a major U-turn by making a single, somewhat opaque (and unreferenced) statement:

***'Do not use the terms "typical" and "atypical" because they can cause confusion.'***

This sentence seems to echo the narrative in a paper published in this journal 3 years ago (Sholapurkar, 2013a). Some more detail and clarity by NICE (2014)

would have been helpful, especially for the midwives and junior obstetricians who may not understand why the terms 'typical and atypical variable decelerations' had to be abandoned rather than any confusion around them being resolved. There is also a chance they may be anxious about ignoring decelerations that they would have previously labelled as 'atypical' and pathological. Midwives and obstetricians need to be reassured by a more transparent explanation that the categorisation of atypical variable decelerations based on the previous criteria, especially the absence of one or both shoulders, was unscientific (except for late components or late recovery); this was what caused the confusion and made CTG interpretation dysfunctional. A small number of papers have pointed out the fallacy of atypical variable decelerations (Cahill et al, 2012; Hamilton et al, 2012; Sholapurkar, 2012; 2013a; 2013b). Some of these papers also made a scientific argument that the categorisation of decelerations into early, late and variable types needs to be reformed to reflect the previous traditional British classification based solely on the time relationship to contractions, and not on gradual/rapid shape. There is a need for specific, unambiguous and scientific definitions of decelerations. Previously, midwives and obstetricians were given flawed training that early and late decelerations should be 'truly uniform' (same in depth and duration) and that 'repetitive' means they have to occur with every contraction (NICE, 2007; e-Learning for Healthcare, 2011). These concepts now seem to have been dropped (NICE, 2014;

### Shashikant L Sholapurkar

Obstetrician and gynaecologist,  
Royal United Hospitals Bath  
NHS Foundation Trust  
s.sholapurkar@nhs.net



Ayres-de-Campos et al, 2015), but some confusion may persist. Hence, it should be more clearly emphasised to midwives and obstetricians that decelerations do not need to be 'truly uniform' anymore. NICE (2014) could have achieved this by providing specific and unambiguous definitions of FHR parameters, particularly the decelerations, as there has been a great deal of confusion about them (as acknowledged in the guidelines). Many obstetricians and midwives have been subjected to performance management over the last few years while this major element of the guidelines has been unscientific and confusing, requiring a major correction (NICE, 2014).

With the knowledge that the categorisation of 'atypical variable decelerations' was unscientific (not just confusing), those obstetric units that have not yet changed their practice should consider doing so. There is now debate over whether obstetric units should adopt the NICE (2014) or International Federation of Gynecology and Obstetrics (FIGO) (Ayres-de-Campos et al, 2015) interpretation of 'pathological variable decelerations'—neither of which has been validated by clinical evidence, but constitute a 'trial and error' approach based on consensus only. NICE (2014) seems to be already considering revising its criterion of >60 seconds for pathological variables (personal communication). The

FIGO 3-tier CTG classification table does not mention 'variable decelerations' at all, despite this supposedly being the most common type of deceleration (Ayres-de-Campos et al, 2015). The pathological category mentions 'repetitive late or prolonged decelerations during >30 min... or one prolonged deceleration with >5 min' (Ayres-de-Campos et al, 2015: 22). Are we supposed to conclude that the 'repetitive prolonged decelerations' refer to variable decelerations of >3 minutes' duration (inferred from the section on definitions)? Such lack of clarity could cause great confusion. The FIGO definition of pathological variable decelerations as more than 3 minutes in duration seems unrealistic and unsafe, with unproven reliability.

All of this does not inspire confidence and is indicative of scientific deficit and wrong approach. Importantly, it appears that the opportunity to debate and reform categorisation of early, late and variable decelerations (Sholapurkar, 2013a; 2013b) seems to have been missed in the latest guidelines (NICE, 2014; Ayres-de-Campos et al, 2015). Without such a reform, the current problems in discrimination of FHR decelerations are unlikely to be solved (Sholapurkar, 2013b). Many senior midwives and obstetricians prefer the previous UK categorisation of FHR decelerations (Sholapurkar, 2013a), and they need to make their voices heard.

## Intermittent auscultation of fetal heart rate

British obstetric and midwifery practice has a long and well-established tradition of intermittent auscultation (IA) of FHR in low-risk labour. The technique was formalised by the Royal College of Obstetricians and Gynaecologists (RCOG, 2001) and the NICE (2007) guidelines. These guidelines—along with long-standing midwifery practice—specifically avoided auscultation of FHR during contractions. The British practice specifically did not recommend listening to FHR during contractions. This was deliberately designed to avoid/disregard the (unhelpful) detection of FHR decelerations coinciding with and limited to contractions, because the clinical experience and pathophysiological basis suggested that these are not associated with fetal hypoxaemia and were rightly considered benign (Sholapurkar, 2013a; 2013b). NICE (2014) has done an excellent job of making a pragmatic recommendation to increase the application of IA in low-risk labours, in the context of the drawback of increased operative intervention associated with CTG. It has issued clear and welcome criteria about when to switch over to CTG from IA. Up to 45% of women could be considered low risk and suitable for birth outside of hospital consultant units (NICE, 2014).

The RCOG (2001) and NICE (2007; 2014) recommend auscultation of FHR for 60 seconds immediately following uterine contraction every 15 minutes in the first stage of labour, and every 5 minutes in the second stage; this is clearly intended to detect late FHR decelerations. The Royal College of Midwives (2012) evidence-based guidelines for IA quote a review paper proposing the need for more extended auscultation before and after contractions as something to be watched in future (Sholapurkar, 2010). It hypothesised that merely auscultating for 60 seconds after contractions may not reliably pick up prolonged late decelerations which start to recover after that time, and may even miss their serious combination with baseline tachycardia (Sholapurkar, 2010). Most hospital and community maternity units encounter cases of unexplained poor neonatal outcome occasionally, despite

well-documented normal IA findings. This is, of course, distressing for the midwives who feel subject to criticism and a sense of failure or disappointment. In 2015, a review paper reported that the strict adherence to NICE (2007; 2014) guidelines may be missing many late decelerations, because their nadir is commonly reached before the end of a contraction and its recovery after the contraction may be mistakenly interpreted as accelerative pattern on IA (Sholapurkar, 2015). It seems reasonable to argue that to establish the baseline FHR, auscultation (with a handheld Doppler device) shortly before the contraction, or from the end of a contraction to the beginning of the next contraction, would be necessary. The FHR after the contraction can then be interpreted in the context of this baseline (Sholapurkar, 2010; 2015). The recommendation of recording a single average figure of FHR over 60 seconds after contractions (NICE, 2014) seems even less informative (Sholapurkar, 2015). It would be possible to auscultate before, during and after the contraction, provided any FHR decelerations limited (coincident) to contractions are ignored (Sholapurkar, 2015).

In October 2015, the FIGO issued a guideline for IA for the first time (Lewis and Downe, 2015). It recommended more extended auscultation during and after the uterine contraction, but advised that CTG be commenced if any decelerations are suspected, even during and limited to the contractions. The American Congress of Obstetricians and Gynecologists (2009) favours continuous EFM, rather than IA, in all labours. Continuous EFM has been the norm in American practice, and practical experience of IA may be lacking. The American experts contributing to the FIGO guidelines held a view that IA should be performed only in the first stage of labour and that CTG should be preferred in all cases during the second stage (Lewis and Downe, 2015). This view seems difficult to understand and support, because if IA is valid in the first stage there seems no reason why it should not be continued in the second stage. If IA is not considered fit for the second stage of labour, then why should it be practised in the first stage where more instances of fetal hypoxaemia occur or commence? It seems vital that

the concept of switching over to CTG if decelerations are detected during the contractions (Lewis and Downe, 2015) should not be accepted, because these are benign and it would be against established and long-standing British practice and experience. Moreover, FHR decelerations during contractions are not infrequent, especially during the second stage. Hence it is likely that a large number of cases would be unnecessarily switched over to CTG or transferred to hospital obstetric units, with resultant disempowerment of midwifery practice and increased medical intervention.

International guidelines, which inevitably involve negotiation, concessions and compromise, are not necessarily suitable in British practice. The Royal College of Midwives may soon have to formulate revised guidelines for IA because of the perceived risk with the current guidelines, but I believe it would be best not to recommend auscultation during contractions or, if performed, any decelerations coincident with contractions should be ignored.

## Conclusions

The next few years are likely to see continuing changes in CTG interpretation, as well as IA. Midwives are the first line of birth attendants interpreting CTG and IA, and will therefore be most affected by such changes. Midwives—and the professional bodies representing them—should take a more active role in shaping these changes and future improvements. **BJM**

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