

Defining severe maternal morbidity – when is it time to stop?

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This special issue of *Paediatric and Perinatal Epidemiology* contains three papers devoted to defining severe maternal morbidity. Himes and colleagues¹ used criteria developed by the Centers for Disease Control to interrogate their routine hospital data, and then validated the identified cases using American College Of Obstetricians and Gynecologists criteria as their ‘gold standard’. They identified that about half the cases based on the CDC criteria were false positives according to ACOG criteria, and that there was a likelihood of substantial numbers of false negative cases. As part of the Europeristat collaboration, Chantry and colleagues² investigated potential indicators of severe maternal morbidity that could be consistently used across hospital discharge databases in Europe. They compared their findings to population-based mortality estimates, and concluded that data for only two indicators, hysterectomy and red cell transfusion, when associated with an obstetric haemorrhage code, were of sufficient quality for international comparisons. Dzakpasu and colleagues³ developed another consensus set of criteria amongst a multi-disciplinary group of experts in Canada, on the basis of their observation of the lack of agreement internationally, and perceived lack of comparability of other studies.

The World Health Organisation's 'near-miss approach', defining a set of 25 'potentially life threatening conditions' was published in 2011.⁴ Why then are we still attempting to define severe maternal morbidity? A multitude of literature either supports or critiques the WHO approach, and proposes alternative definitions. It can be summarised in two different areas: the detailed data collection required to identify cases using the WHO approach and hence varying applicability across different settings, allowing for international comparison, and need for local engagement, ownership and consensus.

The WHO's 25 'potentially life-threatening conditions' include a combination of three different types of inclusion criteria: specific severe maternal complications, critical interventions, and organ-system dysfunction criteria; many of these conditions may be defined by results of detailed laboratory tests. Systematic identification of women meeting the criteria requires completion of a form which appears at first sight complex, and necessitates a number of tests to be carried out. To be robustly completed, it requires dedicated trained staff. Although not widely discussed in the literature, there perhaps lies the first problem; a need for resource in terms of staff time and training. This requirement alone makes implementation as a routine difficult, and perhaps explains attempts to define severe maternal morbidity using criteria identifiable in hospital discharge data.

A recent systematic review drew together the studies which had attempted to use the WHO criteria in Sub-Saharan African settings and summarised the challenges encountered.⁵ Most noted that a number of laboratory markers were unavailable, some stating this solely as a limitation, others specifically adapting the criteria to remove those which were impossible

to assess. Some noted that although tests could be performed, they could not be undertaken in a sufficiently timely manner for the criteria to be useful. Others noted specific interventions that were not available, for example use of vasoactive drugs, or not available in sufficiently high amounts to meet threshold criteria, such as blood transfusion. A Delphi process, specifically to identify adaptations to the WHO criteria for Sub-Saharan Africa,⁶ determined that most of the laboratory and management-based criteria were not applicable, and proposed inclusion of some additional clinical criteria.

Challenges have also been identified in applying WHO near-miss criteria in high-income settings. A study in the Netherlands compared women identified to have severe maternal morbidity or maternal death according to previously defined consensus criteria and found that two thirds of women they defined as having severe acute maternal morbidity, and one third of women who died, were not identified by the organ dysfunction-based criteria of the WHO approach.⁷ Ten percent of women who died during or up to six weeks after pregnancy were not thought to meet any of the near-miss criteria.⁷ The authors appropriately noted that widely differing thresholds for interventions, for example, for intensive care unit admission, render the criteria unsuitable for international comparison even across high resource settings where these interventions are widely available.

The use of clinical criteria to define severe maternal morbidity seems appealing, since that is the way most clinicians think and are taught. However, to maintain comparability across epidemiological studies and allow for comparison over time and across countries actually requires detailed parameters to be identified to underpin the definition of each condition, and this can be challenging. An international Delphi process conducted under the auspices

of the International Network of Obstetric Survey Systems (INOSS) to define specific severe obstetric complications, for example,⁸ took up to eight rounds before agreement was reached. Nevertheless, individual criteria have been used to allow successful collaborative and comparative multi-country studies.^{9, 10}

Identifying cases using these criteria, however, requires specific primary data collection, which has the same drawback as the WHO criteria of requiring staff time and resource. Initiatives such as those of Himes, Chantry, Dzakpasu,¹⁻³ albeit in need of refinement, provide a potential way forward using electronic administrative data where these are available, noting that if routine data are used, clinicians, researchers and policy-makers must understand the limitations and comparability of the approaches and hence the resulting figures.

Multiple examples of other national consensus processes to develop criteria to define severe maternal morbidity exist, often as the starting point of national initiatives to begin monitoring of severe maternal morbidity as part of initiatives to improve the quality of maternity care. Here perhaps, lies the crux of the matter. For such essential initiatives to succeed, there is a need for local ownership and engagement with the process. The choice of which conditions are included is a valuable part of the process, allowing local staff to contribute their expertise concerning their hospital facilities and populations to determine the priorities for areas in which to focus quality improvement initiatives.

The solution to all of these challenges seems clear, but how an international framework and consensus can be reached is less so. Taking forward the approaches described in this special

issue, with those of INOSS and the WHO to establish a consensus framework for surveillance of severe maternal morbidity seems to be the next necessary step. The framework should include simple core criteria which can be identified retrospectively from hospital administrative data as well as prospectively, and a menu of additional criteria, with accepted consensus diagnostic parameters applicable across low, middle and high income settings, with which individual hospitals, regions and countries can personalise surveillance to meet the needs of their local populations. Rates of morbidity according to the core criteria will be internationally comparable, but the resulting quality improvement initiative will be tailored to local priorities. Perhaps then we can stop redefining severe maternal morbidity.

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