Antenatal Fetal Assessment

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GUIDEline EVALUATED

INTRODUCTION
Clinical practice guidelines are detailed statements developed by an organization, using a formal process, to assist clinicians and patients/clients in making decisions about appropriate health care for specific clinical circumstances. They are a means of translating the evidence from the current scientific literature into recommendations for clinical practice with the goal of improving outcomes. Many groups in Canada are now engaged in developing clinical practice guidelines for health care providers.

In order to assist and support registered midwives in Ontario to provide evidence-based care, and to provide informed choice to women and their families, the Association of Ontario Midwives (AOM) reviews, evaluates and endorses, where applicable, existing clinical practice guidelines. Guidelines from other professional organizations are evaluated and graded by midwife authors utilizing the Appraisal of Guidelines Research and Evaluation (AGREE) Instrument. This tool provides a systematic framework for assessing key components of clinical practice guideline quality, with the goal of assessing quality, validity, the method of guideline development and identifying bias. The evaluation of clinical practice guidelines for the AOM includes discussion of issues which are specifically related to the midwifery model of care and scope of practice.

The goal of the Association of Ontario Midwives in evaluating current clinical practice guidelines is to provide for midwives a set of comprehensive and accessible guidelines. These guidelines, along with those developed by the AOM, will guide midwives in clinical practice, assist with informed choice discussions and aid midwives with practice protocol development. When using these guideline reviews, midwives are advised that the review cannot be used in isolation, but must be read in conjunction with the guideline in order to achieve a full understanding of the recommendations.
EVALUATION

This is the link to the SOGC Guideline that is the subject of this review:


The purpose of this SOGC Clinical Practice Guideline is “to design national guidelines instructing obstetric care providers when, and in what populations, to consider antenatal testing; which testing options are available; when to choose one testing method over another; and the expected impact on perinatal morbidity and mortality.”

The guideline was evaluated by the principal author using the AGREE instrument, and found to be of moderate overall quality. The strengths (highest scores) were related to clinical data, critical appraisal of research evidence and useful tools for application. The main areas of weakness (lowest scores) were related to structural omissions and limited clinical applicability. Structural omissions refer to factors such as lack of statements regarding potential conflicts of interest, lack of patient involvement in guideline development, or outlining of possible organizational barriers to implementing recommendations. The limited clinical applicability refers to the clinical practice guideline as a working tool, rather than to the quality of evidence which is excellent.

OVERALL EVALUATION OF CLINICAL PRACTICE GUIDELINE: RECOMMENDED WITH PROVISOS OR ALTERATIONS

The recommendations contained in the SOGC Clinical Practice Guideline “Antenatal Fetal Assessment” should be applied to midwifery practice with the provisos and/or alterations discussed in the body of this review.

SUMMARY OF RECOMMENDATIONS

Antenatal testing strategies should be employed in specific pregnancy populations identified to be at risk for fetal asphyxia. (Class B evidence)

In addition to the sole recommendation stated above, recommendations relating to clinical practice can be identified throughout the text of the clinical practice guideline, and are as follows:

- For pregnancies complicated by insulin dependency, testing should begin between 32-36 weeks gestation. (III-B)
- Monitoring of the postdates pregnancy should begin between 41-42 weeks of pregnancy.
- Immediate antenatal fetal assessment should begin with any decrease in fetal movement. (III-B)
- Frequency of fetal assessment should reflect the specific needs and risk factors presented, usually once to twice weekly. (II-3B)

CURRENT RESEARCH

A review of the literature was conducted using MEDLINE. The major focus of the literature review was on data published from January 2000 through November 2004, as this represents data that was released after completion of the evaluated guideline.

The past several years have brought some interesting new developments in the area of antenatal fetal assessment and recognition of maternal risk factors. With improvements in quality of ultrasound, and some solid research into routine antenatal practices, changes in practice have been recommended. Given the variety of modalities in fetal testing and identified risk factors, each topic will be outlined separately.

Patients at Risk: The SOGC clinical practice guideline lists various clinical conditions that warrant antenatal fetal testing. Current research suggests the addition of social burden, smoking and age to this list of conditions which may require increased surveillance. A large retrospective study by Kunzel and Misselwitz illustrates factors which should be considered as increasing risk and possibly requiring increased antenatal fetal assessment. More than 50% of stillbirths within this study were associated with maternal medical histories complicated by adverse social situations (not specifically defined in this study), maternal smoking, increased maternal age greater than age 35, or diabetes mellitus.

Fetal Movement Counting: The value of formal versus informal fetal movement counting has been discounted and considered of little value, as stated in the SOGC clinical practice guideline. This conclusion is drawn from a single large RCT published in the Lancet in 1989. Upon careful review, the rigour, quality and findings of this study are now being criticized. A recent meta-analysis of twenty-four studies evaluating the outcome of fetal movement counting has found that increased
vigilance regarding maternal perception of movements reduces stillbirth rates. (II-2) There is a need for further well-designed studies to address issues including types of charts and differing methods of fetal movement counting.

Non-Stress Test (NST): Research continues to illustrate the poor positive predictive value of the NST in detecting poor neonatal outcome, yet it continues to be the most widely used method for antenatal testing.

Auscultated Acceleration Test (AAT): Although this method of testing is not mentioned in the SOGC clinical practice guideline, it may be of particular interest and applicable to midwives in remote settings where continuous electronic fetal monitoring may be unavailable. The purpose of the AAT is to gather similar information as an NST, without the need for electronic fetal monitoring. The AAT involves auscultating, with a fetoscope or hand-held doppler, the fetal heart rate for two minutes to establish a baseline rate, which is recorded on an AAT collection graph in 5 second increments. The definition of an acceleration is an increase of 2 beats over baseline per 5-second period, which is equivalent to a 24 beat per minute acceleration. If an acceleration of 2 beats per 5-second period does not occur during the initial 2 minutes, then external manual manipulation of the fetus using a 5 second shaking procedure is performed to stimulate fetal movement. The shaking procedure is repeated if no fetal movement occurs in the 2 minutes following the initial shaking procedure. The fetal heart is auscultated for an additional 2 minutes following the fetal movement, with the entire test completed within 6 minutes. A reactive test is defined as at least one increase of 2 beats per 5-second period above baseline in the 6-minute study period. This is equivalent to a 24 beat per minute acceleration in fetal heart rate. Studies by Paine et al. compared the AAT to the NST, consistently finding that the AAT predicted poor perinatal outcomes more accurately than the NST. (II-1)

Contraction Stress Test (CST): Nipple stimulation is the preferred method for inducing a contraction stress test. Two cycles of 2 minutes of stimulation will result in satisfactory contraction frequency in over 75% of women. Intravenous oxytocin is generally only required in women with insensitive nipples, often seen with breast reduction surgery. The duration of the CST using nipple stimulation is less than half of the time typically required using intravenous oxytocin. The contraction stress test is a better long-range predictor of placental insufficiency and has a much lower false-positive rate compared to the NST. (III)

Sonographic Assessment of Fetal Behaviour and/or Amniotic Fluid Volume: As stated by the SOGC, the two most often used markers of amniotic fluid volume, the amniotic fluid index (AFI) and the single deepest pocket (SDP), have not proved to be correlated to actual amniotic fluid volume. Several randomized controlled trials have recently been published attempting to determine whether the AFI or the SDP is a superior antenatal fetal assessment tool. The single deepest pocket technique, a component of the biophysical profile, is associated with a significantly lower incidence of suspected oligohydramnios and subsequently decreased rate of unnecessary inductions in comparison to the AFI. As Chauhan et al. states, “There is no association between pathologic acidosis and AFI, then continued use of this technique to assess amniotic fluid is unnecessary, especially because randomized clinical trials indicate an increased rate of intervention without improved outcome.”

Umbilical Doppler Velocimetry (UDV): There continues to be little evidence to support the routine use of UDV in low-risk pregnancies. A recent review illustrated that the combination of Doppler velocimetry and the biophysical profile is a better predictor of perinatal mortality, acidosis, and neonatal morbidity than either modality alone in the pregnancy complicated by growth restriction.

ADDITIONAL MIDWIFERY CONSIDERATIONS

Midwives are the primary care providers for low-risk pregnant women. Routine antenatal fetal testing in this population has demonstrated little value, both from a sensitivity and cost-benefit perspective. Vigilance in recognizing maternal risk factors and clinical conditions that increase the risk of fetal asphyxia and require antenatal fetal assessment is the key role that midwives can play in the obstetric team. Midwives must be aware of and understand the various testing options available in their communities in order to ensure prompt and thorough assessment; similarly, midwives should offer to women, if they require it, the same level of assessment that would be available to all pregnant women in that community. It should be remembered, in applying the SOGC guideline to midwifery practice, that the guideline regards fetal movement counting as a form of antenatal fetal assessment, and that the four forms of antenatal assessment discussed can be used “simultaneously or in a hierarchical fashion.”

Understanding alternatives to commonly used methods for antenatal fetal testing can be particularly useful for
midwives. Tests such as the Auscultated Acceleration Test or nipple stimulation for the Contraction Stress Test may be applicable in remote settings where resources are limited. These alternatives are less invasive and may be attractive to clients wishing to limit the use of technology in their prenatal care. Further research is required before these tests can be recommended for routine use in antenatal fetal assessment.

Despite the differing clinical conditions and various tests available, the single goal of all antenatal fetal assessment is to determine the optimal timing of delivery. Midwives can expedite this process through good communication with the obstetric team and prompt consultation in the event of abnormal testing.
CONCLUSION

After evaluation using the AGREE instrument and assessment of the current literature, the Association of Ontario Midwives recommends the application of the SOGC Clinical Practice Guideline “Antenatal fetal assessment” to midwifery practice with these additional recommendations:

- Consider social risk factors which may contribute to an increased risk to fetal wellbeing, and which may require antenatal fetal testing. (II-3)
- Increased vigilance towards maternal perception of movements may reduce stillbirth rates. (II-2)
- The Auscultated Acceleration Test may be useful in remote settings where electronic fetal monitoring is unavailable. (II-1)
- Nipple stimulation is the preferred method over intravenous oxytocin for the Contraction Stress Test. (III)

Ultrasound to assess amniotic fluid volume should be performed using the single deepest pocket method, as it will decrease unnecessary intervention in comparison to the amniotic fluid index. (I)

REFERENCES