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Fetal Soft Markers in Obstetric Ultrasound

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Abstract

Objective: To evaluate ultrasound "soft markers" used in fetal genetic screening.

Options: Ultrasound screening at 16 to 20 weeks is one of the most common genetic screening and (or) diagnostic tests used during pregnancy. The practical concern for ultrasound screening is false-positive and false-negative (missed or not present) results. The use and understanding of ultrasound soft markers and their screening relative risks is an important option in the care of pregnant women. Currently, the presence of a "significant" ultrasound marker adds risk to the likelihood of fetal pathology, but the absence of soft markers, except in controlled situations, should not be used to reduce fetal risk.

Outcomes: The use of ultrasound in pregnancy has significant health and economic outcomes for families and the health care system, compared with no ultrasound use. The Society of Obstetricians and Gynaecologists of Canada (SOGC) recommends a single "routine" ultrasound evaluation at 16 to 20 weeks in all pregnancies. Patients need to be counselled about the positive and negative findings that ultrasound may reveal so they are prepared for unexpected pregnancy knowledge and the possibility of further testing options being offered.

Evidence: Committee members were asked to review specific soft marker ultrasound topics after consensus was reached on the most commonly published soft markers. Medline and PubMed databases were searched for peer-reviewed English articles published from 1985 to 2003. Reviews of each soft marker topic were written by committee members with quality of evidence and classification of recommendations. These reviews were then circulated and discussed by the combined committee. Final format for the guideline was completed by the committee chairpersons.

Values: The quality of evidence and classification of recommendations followed discussion and consensus by the combined committees of Diagnostic Imaging and Genetics of the SOGC.

Benefits, Harms, Costs: It is not possible at this time to determine the benefits, harms, and costs of the guideline because this would require health surveillance and research and health resources not presently available; however, these factors need to be evaluated in a prospective approach by provincial and tertiary initiatives. Consideration of these issues is in the options and outcome section of this abstract.

Recommendations:

1. The screening ultrasound at 16 to 20 weeks should evaluate 8 markers, 5 of which (thickened nuchal fold, echogenic bowel, mild ventriculomegaly, echogenic focus in the heart, and choroid plexus cyst) are associated with an increased risk of fetal aneuploidy, and in some cases with nonchromosomal problems, while 3 (single umbilical artery, enlarged cisterna magna, and pyelectasis) are only associated with an increased risk of nonchromosomal abnormalities when seen in isolation (II-2 B).
2. Identification of soft markers for fetal aneuploidy requires correlation with other risk factors, including history, maternal age, and maternal serum testing results (II-1 A).
3. Soft markers identify a significant increase in fetal risk for genetic disease. Timely referral for confirmation, counselling, and investigation is required to maximize management options (III-B).

Validation: Peer-reviewed guideline development is part of the committee process in addition to SOGC council and editorial review.

Sponsors: SOGC.

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Key Words: Ultrasound, soft marker, prenatal screening, fetus, aneuploidy, trisomy, genetic

INTRODUCTION

Providing an obstetric ultrasound at 16 to 20 weeks' gestation has become standard practice in Canada.[1–3]

Although there are many potential benefits, the primary reason to routinely offer this scan is for the detection of fetal abnormalities.[4–6] Some obstetric ultrasound findings are considered variants of normal but are noteworthy because they also increase the risk for underlying fetal aneuploidy. These findings are known as "soft markers" and should be considered distinct from fetal anatomic malformations and (or) growth restriction that also increase perinatal and genetic risks.

The presence of soft markers increases the risk for fetal aneuploidy but is not diagnostic. Individual soft markers will vary in the degree of association with fetal aneuploidy. It has become practice to estimate the degree of association as a likelihood ratio (LR) by which the a priori background risk is altered. Detection of multiple soft markers will increase the significance of the finding, compared with seeing the same marker in isolation.[7,8] Nonsonographic factors, including maternal age, gestational age, past history, and family history also influence the chance for aneuploidy and should be considered to establish an accurate a priori risk.[9–12] In addition, maternal serum testing as an alternate screening tool can complement and enhance the overall screening process.[13–18] Providing an accurate assessment of fetal genetic risk requires the ability to integrate known factors before patients can make an informed choice about proceeding with invasive diagnostic testing.

The purpose of this guideline is to (1) evaluate the usefulness of each ultrasound soft marker, (2) assess whether a specific soft marker should be looked for routinely on screening ultrasound, (3) review potential nonkaryotypic implications for soft markers, (4) suggest follow-up recommendations to deal with soft markers once detected, and (5) provide assessment of the quality of information regarding each marker. (See Table 1 for the quality of evidence and classification of recommendation).[19]

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