Guideline Summary NGC-3131

Guideline Title
Neural tube defects.

Bibliographic Source(s)

Guideline Status
This is the current release of the guideline.

This guideline updates a previous version: American College of Obstetricians and Gynecologists (ACOG). Neural tube defects. Washington (DC): American College of Obstetricians and Gynecologists (ACOG); 2001 Mar.

The American College of Obstetricians and Gynecologists (ACOG) reaffirmed the currency of the guideline in 2008.

Scope

Disease/Condition(s)
Neural tube defects, including:
- Cranial defects (anencephaly, exencephaly, encephalocele, and iniencephaly)
- Spinal defects (spina bifida, meningocele, meningomyelocele, myeloschisis, holorachischisis, and craniorachischisis)

Guideline Category
Diagnosis
Management
Prevention
Risk Assessment
Screening

Clinical Specialty
Medical Genetics
Neurological Surgery
Neurology
Obstetrics and Gynecology
Pediatrics
Preventive Medicine

Intended Users
Physicians

Guideline Objective(s)
- To aid practitioners in making decisions about appropriate obstetric and gynecologic care
- To provide guidelines on screening for and primary prevention of neural tube defects and for management of delivery of fetuses with neural tube defects

Target Population
- Pregnant women diagnosed with fetal neural tube defects
- Fetuses and newborn infants with neural tube defects

Interventions and Practices Considered

Diagnosis/Screening
1. Maternal serum alpha-fetoprotein (MSAFP) evaluation
2. Amniocentesis
3. Ultrasound

Management
Major Outcomes Considered

- Risk factors for neural tube defects
- Effectiveness of periconceptional folic acid supplementation for preventing neural tube defects
- Predictive value of serum alpha-fetoprotein levels in screening for neural tube defects

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' (ACOG's) own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1985 and January 2003. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document.

Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles.

2008 Reaffirmation

For reaffirmation of a current Practice Bulletin, MEDLINE and Cochrane are searched for new literature. At the discretion of the review committee, additional databases may be searched for particular topics as warranted. In addition, committee members identify relevant literature for review.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force.

1. Evidence obtained from at least one properly designed randomized controlled trial
2. Evidence obtained from well-designed controlled trials without randomization
3. Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group
4. Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.
5. Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Analysis of available evidence was given priority in formulating recommendations. When reliable research was not
available, expert opinions from obstetrician-gynecologists were used. See also the “Rating Scheme for the Strength of Recommendations” field regarding Grade C recommendations.

2008 Reaffirmation

Each American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin is reviewed every 18-24 months by a member of the Practice Bulletins Committee. The reviewer presents the practice bulletin and any new literature at a full committee hearing. The committee then reaches a consensus on whether to reaffirm or withdraw the practice bulletin.

Rating Scheme for the Strength of the Recommendations

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A - Recommendations are based on good and consistent scientific evidence.

Level B - Recommendations are based on limited or inconsistent scientific evidence.

Level C - Recommendations are based primarily on consensus and expert opinion.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Description of Method of Guideline Validation

Practice Bulletins are validated by two internal clinical review panels composed of practicing obstetrician-gynecologists generalists and sub-specialists. The final guidelines are also reviewed and approved by the American College of Obstetricians and Gynecologists (ACOG) Executive Board.

Recommendations

Major Recommendations

The grades of evidence (I-III) and levels of recommendations (A-C) are defined at the end of the "Major Recommendations."

The following recommendations are based on good and consistent scientific evidence (Level A):

- Periconceptional folic acid supplementation is recommended because it has been shown to reduce the occurrence and recurrence of neural tube defects (NTDs).
- For low-risk women, folic acid supplementation of 400 micrograms per day currently is recommended because nutritional sources alone are insufficient. Higher levels of supplementation should not be achieved by taking excess multivitamins because of the risk of vitamin A toxicity.
- For women at high risk of NTDs or who have had a previous pregnancy with an NTD, folic acid supplementation of 4 mg per day is recommended.
- Maternal serum alpha-fetoprotein (AFP) evaluation is an effective screening test for NTDs and should be offered to all pregnant women.

The following recommendations are based on limited or inconsistent scientific evidence (Level B):

- Women with elevated serum alpha-fetoprotein levels should have a specialized ultrasound examination to further assess the risk of NTDs.
- The fetus with an NTD should be delivered at a facility that has personnel capable of handling all aspects of neonatal complications.

The following recommendations are based primarily on consensus and expert opinion (Level C):

- The ideal dose for folic acid supplementation has not been appropriately evaluated in prospective clinical studies. A 400 microgram supplement currently is recommended for women capable of becoming pregnant.
- The route of delivery for the fetus with an NTD should be individualized because data are lacking that any one route provides a superior outcome.

Definitions:

Grades of Evidence

I Evidence obtained from at least one properly designed randomized controlled trial

II-1 Evidence obtained from well-designed controlled trials without randomization

II-2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group

II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.

III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

Levels of Recommendations

Level A - Recommendations are based on good and consistent scientific evidence.
Cranial defects (anencephaly, exencephaly, encephalocele, and iniencephaly).

To aid practitioners in making decisions about appropriate obstetric and gynecologic care.

Predictive value of serum alpha fetoprotein (AFP) evaluation is an effective screening test for NTDs and should be offered to pregnant women.

Some over-the-counter multivitamin supplements and most prenatal vitamins contain 400 micrograms of folic acid. Higher levels of supplementation should be achieved by taking an additional folic acid supplement and not by taking excess multivitamins. In particular, vitamin A is potentially teratogenic at high doses, and pregnant women should not take more than the 5,000 IU per day, which is typically found in one multivitamin/mineral supplement.

Qualifying Statements

These guidelines should not be construed as dictating an exclusive course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

Implementation of the Guideline

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need
- Getting Better
- Staying Healthy

IOM Domain
- Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Cranial defects (anencephaly, exencephaly, encephalocele, and iniencephaly)

Maternal serum alpha-fetoprotein levels in screening for neural tube defects

Pregnant women diagnosed with fetal neural tube defects should receive periconceptional folic acid supplementation because it has been shown to reduce the occurrence of neural tube defects.

Risk factors for neural tube defects include:

- Family history
- Maternal age
- Maternal smoking
- Maternal obesity
- Maternal folate deficiency

For low-risk populations, periconceptional folic acid supplementation is recommended to prevent neural tube defects.

Folic acid supplementation:

- A 400 microgram supplement currently is recommended for women capable of becoming pregnant.
- Higher levels of supplementation should not be achieved by taking excess nutritional sources alone.
- Folic acid is considered nontoxic even at very high doses and is rapidly excreted in the urine.
- There have been no reports of folic acid toxicity in pregnant women.

Risks of folic acid supplementation:

- Folic acid cannot mask the neuropathy typical of this diagnosis.
- Currently, 12% of patients with pernicious anemia experience an associated increase in seizure frequency while taking folic acid supplements.

Monitoring drug levels and increasing the dosage as needed may help to avert this complication.

Monitoring:

- Monitoring serum folic acid levels and serum folate levels can help identify patients at high risk for folic acid deficiency.
- Pregnant women should be monitored for folate deficiency during pregnancy.

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