An overview of the recommendations of the Working Group on Asthma and Pregnancy

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Asthma is the most common potentially serious medical disease complicating pregnancy, and uncontrolled asthma during pregnancy may produce both maternal and fetal complications. The Working Group on Asthma and Pregnancy was established by the National Asthma Education and Prevention Program (NAEPP) to address the issues surrounding asthma management during pregnancy, working within the background of the NAEPP's published asthma guidelines. The Working Group's report, published in 1993, presents recommendations and information for diagnosing and managing asthma during pregnancy. Some key points are: (1) asthma should be treated as aggressively in pregnant women as in nonpregnant women; (2) asthma care and obstetric care should be carefully integrated and should include monitoring of fetal growth and development, maternal symptoms, and maternal lung function; (3) as for nonpregnant women with asthma, medications used to treat asthma during pregnancy should include a short-acting symptom reliever medication (usually an inhaled short-acting β_2-agonist) and long-term daily medication to address the underlying inflammation for all patients with more than mild, intermittent disease. (J Allergy Clin Immunol 1999;103:S350-3.)

The Working Group on Asthma and Pregnancy was established by the National Asthma Education and Prevention Program in an attempt to widen the scope of the Program's previously published guidelines on the diagnosis and treatment of asthma.[1] Asthma is now recognized as the most common potentially serious disease that complicates pregnancy. Yet a number of myths impede the delivery of appropriate care to pregnant patients. The Working Group addressed the questions and uncertainties surrounding the treatment of asthma during pregnancy and published its report in 1993.[2] The report attempts to ensure the safety of mothers and their fetuses by emphasizing to physicians the importance of accurate diagnosis and appropriate management of asthma during pregnancy.

The Working Group consisted of 12 physicians (listed in Appendix 1) from a variety of specialties including asthma care specialists (allergists and pulmonologists), obstetricians/gynecologists, reproductive toxicologists, and pharmacologists specializing in issues of neonatal and adult pharmacotherapy. The Group based their recommendations on an intensive review of the available scientific literature, drawing heavily on the Expert Panel Report of the National Asthma Education and Prevention Program.[1]

Members of the Working Group fully recognize that available empiric data are limited and that further research is needed. However, they feel strongly that the available data are sufficient to establish the risks and benefits of treating or not treating pregnant patients with asthma, to outline treatment options, and to make reasoned and reasonable recommendations for care. Good medical practice dictated that the Working Group base their asthma management decisions on many factors including human subject data, animal data, general therapeutic principles, and their own expert judgment and experience.

Members of the Working Group discussed several issues that helped to define their scope. They examined the effects of:

- pregnancy on asthma,
- asthma on pregnancy (for both the woman and the fetus),
- asthma treatment on pregnancy (for both the woman and the fetus), and
- comorbid conditions and pregnancy complications on asthma.

THE EFFECTS OF PREGNANCY ON ASTHMA

Asthma is the most common potentially serious illness to complicate pregnancy. Asthma may begin or be diagnosed during pregnancy, or the severity of asthma may change in association with pregnancy. Approximately one third of pregnant women with asthma show improved asthma control during pregnancy, another one third remain unchanged, and the other third experience a worsening of asthma. It appears that with subsequent pregnancies, approximately two thirds of women experience the same changes in their asthma as they did in their first pregnancy. As with nonpregnant patients, asthma is difficult to diagnose in patients whose predominant symptom is a cough. Similarly, shortness of breath in pregnant women with asthma may be incorrectly assumed to be due to dyspnea of pregnancy. Accurate diagnosis is important. Pulmonary function tests are needed to correctly recognize and characterize respiratory symptoms.

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THE EFFECTS OF ASTHMA ON PREGNANCY

Reported maternal and fetal complications of uncontrolled asthma are numerous and require aggressive asthma management. Maternal complications of uncontrolled asthma include preeclampsia, gestational hypertension, hyperemesis gravidarum, vaginal hemorrhage, toxemia, and induced and complicated labors. Fetal complications of uncontrolled asthma include increased risk of perinatal death, intrauterine growth retardation, preterm birth, low birth weight, and neonatal hypoxia.

The Working Group felt strongly that pregnant women whose asthma is properly controlled can expect to maintain a normal pregnancy with little increased risk to themselves or their fetuses. Aggressive asthma management is required to keep lung function and blood oxygenation as normal as possible to ensure an adequate supply of oxygen to the mother and fetus and to prevent acute asthma attacks.

THE EFFECTS OF ASTHMA TREATMENT ON PREGNANCY

The Working Group report developed goals for asthma therapy. For pregnant women, these goals are:

- full control of symptoms (including nocturnal symptoms),
- maintenance of normal or near-normal pulmonary function,
- normal activity levels (including appropriate exercise),
- prevention of acute asthma episodes,
- avoidance of adverse effects of asthma medication, and
- delivery of a healthy infant.

The underestimation of asthma severity and the undertreatment of exacerbations, in part because of fear of medication effects, lead to adverse outcomes. Therefore the Working Group recommended an integrated asthma and obstetric management program. The program consists of the use of objective measures for assessing and monitoring pulmonary function, avoidance of asthma triggers, a stepwise approach to management of chronic asthma and exacerbations, patient education, and the development of a patient-caregiver partnership.

Objective measures for assessment and monitoring

Examining changes in pulmonary physiology during pregnancy reveals the continuing utility of standard spirometric measurements in the evaluation of airflow obstruction. Although changes in some lung function volumes occur in pregnancy, alterations in airflow cannot merely be ascribed to pregnancy-related changes. FEV_1 and peak flow measurements appear to be reliable measures to assist in the diagnosis of asthma, and in the differentiation of asthma from other causes of dyspnea during pregnancy. Lung function measurements can also provide an indirect measurement for ensuring normal maternal and fetal oxygenation. They can provide early warnings of loss of control so that aggressive step-care management can be used to prevent acute episodes and decrease the risk of hypoxia.

The Working Group also emphasized fetal monitoring. They recommended early sonography as a benchmark for evaluating fetal growth. Sequential sonographic evaluations are indicated if growth retardation is suspected or if the patient's asthma is moderate to severe. The Group also encourages daily kick counts and daily maternal evaluation of fetal activity. In addition, fetal assessment is needed during asthma exacerbations and also during labor. Continuous monitoring is recommended when asthma is uncontrolled or severe, or when fetal assessment on admission is not reassuring.

Avoidance and control of asthma triggers

Avoidance and control of asthma triggers is extremely important during pregnancy in order to reduce the need for pharmacotherapy and to reduce the incidence of asthma exacerbations. Ongoing immunotherapy can be continued in an attempt to reduce allergic response. However, the Group recommends that immunotherapy not be initiated during pregnancy.

Stepwise pharmacotherapy

The Working Group emphasized stepwise pharmacotherapy and recommends a careful step-up and step-down approach with ongoing monitoring. The aim of pharmacotherapy is to ensure that the goals of asthma management are met. If the patient's asthma is more than intermittent,[1] anti-inflammatory therapy is recommended. Cromolyn sodium is deemed the reasonable first choice. If inhaled corticosteroids are needed, beclomethasone is preferred. Inhaled β-agonists are recommended as rescue drugs, but no specific β-agonist is preferred over the others for treating pregnant women.

The Working Group encourages physicians to develop a written action plan for managing asthma exacerbations. The action plan should revolve around responding to symptoms and to decreased peak flow. A rapid response is recommended. Treatment should focus on normalizing pulmonary functions test results and on maintaining adequate oxygenation. Administering inhaled β-agonists, providing oxygen supplementation, and introducing aggressive and early systemic corticosteroids are emphasized. Monitoring is deemed essential, and the report outlines the potential maternal and fetal risks associated with hypoxia.

The Working Group also stressed 2 important points. First, fetal distress can occur in the absence of maternal hypotension or severe hypoxia. Second, after an extensive review of animal and human data, the Group was able to document few risks of adverse effects to the fetus as a result of asthma pharmacotherapy. Clearly, the known risks of uncontrolled asthma are deemed greater than any known risks to the mother or fetus from pharmacotherapy during pregnancy.

During labor and delivery, asthma is often quiescent, and in general, exacerbations during this period are easi-

ly controlled. However, patients who have required long-term systemic corticosteroids should be given hydrocortisone during labor and delivery because of the risk of maternal adrenal suppression.

Patient education

Members of the Working Group regarded patient education as a critical component for management of asthma during pregnancy. Information for patients must include addressing the myths around pregnancy and asthma treatments. The woman needs to be reminded that she is breathing for two.

Patient-caregiver partnership

A good relationship between a patient and her caregiver can improve compliance, satisfaction, and overall outcome. Physicians and other health professionals must hear and address any and all of the patient's concerns. Open communication, combined with family support, can help the physician develop a workable and effective treatment plan. This is of critical importance in treating asthma during pregnancy.

THE EFFECTS OF COMORBID CONDITIONS AND PREGNANCY COMPLICATIONS ON ASTHMA

The Working Group report discusses issues related to pregnancy complications and the use of agents other than anti-asthma medications during delivery. They recommended fentanyl as a preferred analgesic and concluded that lumbar epidural anesthesia would offer patients with asthma considerable benefit, particularly when compared with general anesthesia. If general anesthesia is required, preanesthetic use of atropine or glycopyrrolate may provide bronchodilation. Ketamine (for induction) and halogenated anesthetic agents can also provide bronchodilation for the patient with asthma.

Oxytocin is the drug of choice for labor induction. Prostaglandin $F_2\alpha$ should be avoided in the asthmatic patient population for labor induction or treatment of post-partum hemorrhage, and ergonovine therapy for post-partum hemorrhage is also not recommended in asthmatic women. Instead, oxytocin is recommended for treatment of postpartum hemorrhage. If the patient is already taking a systemic β-agonist, magnesium sulfate is the recommended tocolytic for uterine contractions.

SUMMARY

Asthma is one of the most common illnesses complicating pregnancy. The severity of asthma may change during pregnancy. Regardless of the severity, good asthma control appears critical to ensuring both maternal health and an appropriate environment for fetal growth and development. Long-term management and monitoring is necessary to maintain maternal lung function and maternal-fetal oxygenation. Uncontrolled asthma during pregnancy may produce both maternal and fetal complications. When asthma is properly controlled, asthma in pregnancy does not significantly increase the risk to either the mother or the fetus, and a normal outcome of pregnancy is expected.

To achieve normal maternal functioning and a normal outcome of pregnancy, asthma should be treated as aggressively in pregnant women as it is in nonpregnant women. Underestimation of asthma severity and undertreatment of exacerbations appear to be common errors resulting in inadequate asthma treatment and adverse maternal and fetal outcomes.

Asthma care should be integrated with obstetric care with monitoring of both fetal growth and development and maternal symptoms and lung function monitoring.

Pharmacotherapy revolves around the use of symptom-reliever medication, which is generally easily achieved with the use of short-acting β-agonist by inhalation and the use of long-term regular medication to address the underlying inflammation that characterizes the asthma. Anti-inflammatory medications such as cromolyn sodium and inhaled corticosteroids are appropriate for the pregnant patient and should be used in all patients with asthma that is anything more than mild and intermittent.

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APPENDIX 1

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APPENDIX 2
Selected Readings

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