Asthma and Pregnancy

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ABSTRACT
Asthma is the most common respiratory disorder occurring with pregnancy. The severity of the disease may vary during the pregnancy. With appropriate management good control of asthma can be maintained throughout pregnancy and result in delivery of a normal infant.

Asthma may occur in a pregnant woman with a previous history of asthma or as a first episode. It is the most common respiratory disorder and one of the most common chronic medical conditions to complicate pregnancy.

Of those patients who have been asthmatic prior to pregnancy approximately 40% require increased anti-asthma medication during the pregnancy while 20% require less therapy. Asthma might be variable during pregnancy and also might vary within successive pregnancies. A trend has been noted that women with severe asthma are more likely to deteriorate while mild asthmatics are more likely to improve during pregnancy.

Should an asthma exacerbation occur, it is most likely to appear during the 24th to 36th week of gestation. A small number of patients become increasingly symptomatic during labour or delivery. Should asthma improve or deteriorate during pregnancy, return to the pre-pregnancy status usually occurs within a 3-month period of delivery.

The prevalence of asthma varies, depending on various definitions of the disease, reported exacerbations by the patient or perception of the doctor. However, this appears to range between 4% and 12% in the western world. The greatest danger to both mother and her fetus comes from poorly controlled or undertreated disease.

RESPIRATORY FUNCTION CHANGES DURING PREGNANCY
No significant change in respiratory function occurs during pregnancy. An increase in resting ventilation occurs as a result of both increased oxygen consumption and maternal metabolic rate. The increased demand is achieved by increasing minute ventilation as a result of a rise in tidal volume. This is associated with a mild respiratory alkalosis. During pregnancy approximately three-quarters of women experience a feeling of breathlessness, probably related to an increased awareness of their physiological hyperventilation. It is important to differentiate normal physiological hyperventilation from that of an asthma exacerbation. The lung volumes remain essentially unchanged during pregnancy with the exception of a decrease in functional residual capacity present in late pregnancy related to diaphragmatic elevation secondary to the enlarging uterus.

EFFECT OF PREGNANCY ON ASTHMA
The alteration of asthma in pregnancy is unpredictable. Of concern is that many asthmatic patients experience worsening of their symptoms during pregnancy as a result of the discontinuation or reduction of medication. This occurs because of fears about the safety of their medication which might stem from their own concerns or be the result of inappropriate advice from their doctors.

EFFECT OF ASTHMA ON PREGNANCY
In most women asthma has no effect upon the outcome of the pregnancy. This is particularly true in patients who are well controlled on their appropriate medication and have no exacerbations. A trend has been noted of increased perinatal morbidity associated with lack of control and increased severity of the disease during the pregnancy. There does not appear to be any increased congenital abnormality related to either the disease itself or the use of any form of medication. In patients who are well controlled throughout their pregnancy with rapid management of exacerbations resulting in optimal asthma control, no adverse effects on the fetus are apparent. A slightly increased incidence of maternal complications associated with the presence of severe asthma has been documented. These include pregnancy-induced hypertension, diabetes mellitus and gestational diabetes. These changes have however been predominantly noted in steroid-dependent asthmatics.

Women with asthma who are not using inhaled corticosteroids are at an increased risk of delivering low-birth-weight infants. In addition, low-birth-weight infants have been associated with those asthmatic pregnant women requiring hospitalisation. Pre-term labour and delivery have been associated with the use of oral steroids and theophyllines or of having had a respiratory problem during the pregnancy. It has been reported that the risk of pre-eclampsia may increase in those with moderate to severe persistent asthma during pregnancy whereas the use of theophylline reduces the risk of pre-eclampsia.

Pregnant asthmatics are more likely to receive epidural analgesia and have a caesarian section than are non-asthmatics.

ASTHMA MANAGEMENT
The goal of therapy during pregnancy is to ensure good control of maternal asthma and the well-being of the fetus, leading to the delivery of a normal infant. The medical management of asthma in pregnancy does not differ from that of non-pregnant women. Beta-agonists, including both short- and long-acting varieties have not been shown to have any adverse effect during the pregnancy. Theophyllines have also been documented as being safe. Theophylline levels need to be monitored however to ensure that these are not within the toxic range, as the blood level is similar in both mother and fetus.

The mainstay of therapy remains inhaled corticosteroids which have also been documented by use as being safe at recommended prescribed doses. There does not appear to be any increase of congenital malformation, stillbirth or fetal mortality with the use of
inhaled corticosteroids. As noted above, the lack of use of inhaled corticosteroids has been associated with low-birth-weight infants.

Leukotriene antagonists have increasingly been used in the management of asthma worldwide. No placebo-controlled studies have been performed at present but there does not appear to be any reported adverse effect with their use. It is recommended that therapy should be continued in the difficult to control asthmatic whose control has been achieved with the use of a leukotriene antagonist.

The use of systemic corticosteroids is dictated by the severity of the disease or an acute exacerbation. No teratogenic effect has been documented with the use of systemic corticosteroids during pregnancy in humans. However as noted previously, steroid-dependent asthmatics do have an increased incidence of hypertension and glucose intolerance. When systemic corticosteroids are used, prednisone or methylprednisolone appear to be the drugs of choice as they have poor placental crossing, thus resulting in a low incidence of adrenal suppression in the fetus. The placenta metabolises prednisolone and very little active drug (10%) reaches the fetus.

In acute severe asthma, the management of the pregnant and non-pregnant woman is identical. This includes the use of oxygen, nebulised β₂-agonists, nebulised ipratropium bromide, oral or intravenous steroids and in some cases intravenous aminophylline. It has been noted that pregnant women are sometimes inappropriately treated – they are not given systemic steroids or maintained on a short course of oral steroids following an acute exacerbation.

MANAGEMENT OF ASTHMA DURING LABOUR AND DELIVERY

Acute exacerbations of asthma are unusual during labour and delivery. During delivery the regular use of maintenance medication should be continued. Induction of labour with prostaglandin E₂ (used to ripen the cervix) is bronchodilatory and safe. In contrast, prostaglandin F₂ (for severe postpartum haemorrhage) should be used circumspectly as it may be bronchospastic.

Postpartum breast-feeding should be encouraged and medications which were considered safe during pregnancy can be continued during the lactation period. Prednisone crosses poorly into breast milk and therefore low to moderate dosages are unlikely to cause any adverse effect in the infant.

Patient education is of the utmost importance. Pregnancy provides an excellent opportunity for close monitoring of the asthmatic patient as well as education as to the safety and importance of adherence to medication. Emphasis should be placed on the inflammatory nature of the illness and on the safety of the medication, as well as the importance of adherence. Cigarette smoking is hazardous to the pregnant woman and the fetus; this is particularly so in the asthmatic patient, so the importance of not smoking needs to be reinforced.

REFERENCES


Medical Complications During Pregnancy 6/e

Gerard N. Burrow, Thomas P. Duffy and Joshua Copel

August 2004 ISBN 0721604358, hardback, 592 pp, 81 illus., Saunders, R830

The revised and updated 6th Edition of this popular reference presents coverage of complications associated with pregnancy, including pre-existing conditions. Thirty-one expert contributors offer readers state-of-the-art guidance on the clinical management of the various conditions that affect and are effected by pregnancy. The book addresses the hottest topics in the field, such as post-partum depression and bioethics. For each condition, the book offers comprehensive coverage of pathophysiology as well as state-of-the-art guidance on effective management.

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