

ABC OF ALLERGOLOGY

ALLERGIES IN PREGNANCY

Adrian Morris, MB ChB, DCH, MFPG, Dip Allergy (SA)

The ideal outcome of pregnancy and lactation would be to expose the infant to sufficient levels of allergen that would induce long-term tolerance but not allergic sensitisation.

Pregnancy is a time of intense change within the female body. Hormones have a profound influence on the immune system and allergic diseases may be affected by these changes. The hormones of pregnancy have steroid-like effects which can dampen down allergies. But while in the pregnant state, the female immune system is TH2 down-regulated to prevent rejection of the fetus (which is immunologically a 'foreign organism'). This state of increased immune tolerance has the spin-off of less direct vigilance against foreign substances. However, the allergy-triggering potential of the immune system may also be heightened during pregnancy with the shift to TH2 immune phenotype.¹ Asthma for example may become worse with frequent attacks; it may even occur for the first time in pregnancy, but paradoxically it may become less severe and easier to control during pregnancy.

What happens to existing allergies in pregnancy?

Good asthma control is important in pregnancy to maintain an adequate oxygen supply to the growing fetus. Prematurity and low birth weight may result from poor asthma control in the mother. Most asthma drugs can be safely used in pregnancy and there is no evidence that there is any increased risk to the fetus. We do however recommend the lowest possible doses of any medication sufficient to control symptoms in the pregnant mother.

Nasal allergies often occur for the first time in pregnancy. Pregnant women are prone to nasal blockage, increased nasal discharge and irritating nasal symptoms. This state of affairs seems to be triggered by the hormonal changes in pregnancy.

Urticaria and allergy-like rashes are also common in pregnancy. One particular rash that is peculiar to pregnancy is the pruritis and urticaria papules and plaques in pregnancy (PUPPP) syndrome. This manifests with intensely itchy eruptions, particularly on the lower abdomen and upper thighs. After the birth, the rash rapidly disappears but can be most debilitating during the last few months of pregnancy. Eczema on the other hand often improves during pregnancy. This may possibly be due to the increase in the body's natural steroid-like hormones that are produced during pregnancy.

Preventing allergies in the unborn infant

As far as the unborn baby's health is concerned, the pregnancy and treatment thereof can have profound impact on the fetus's health and predisposition to allergy. We know that if the mother has allergies there is a 30% chance of her baby having an allergy. If both par-

ents have allergy, the baby's risk increases to 60% and if both parents have the same allergy, for example asthma, then the risk of allergy in the unborn baby reaches 80%. Maternal smoking during pregnancy and eating allergy-provoking foods in the last few months of pregnancy may encourage allergic diseases to develop in the baby. Evidence is still lacking that diet in early pregnancy makes any difference. A low-allergen content diet may be more disadvantageous for possible maternal and fetal malnutrition than eventually advantageous for allergy prophylaxis. American and European guidelines therefore recommend normal feeding during pregnancy and lactation.

The fetus is exposed to circulating maternal antigens via amniotic fluid and the placenta. We know that unborn babies start to produce the allergy regulating IgE antibody from 20 weeks of pregnancy. Transplacental passage of common allergens such as β -lactoglobulin, ovalbumin and major birch pollen allergens occurs before 26 weeks of gestation.¹ We used to measure total cord blood IgE levels at birth as an indicator of probable allergic diathesis, but this test is not very accurate, and is no longer recommended.

Smoking in early pregnancy is a potent trigger for the development of allergies in the unborn baby, and if the baby is born into a smoking household this risk increases. The month of birth is extremely important, especially if the birth is in spring with subsequent pollen sensitisation. If a baby is born to allergic parents and the birth month coincides with the beginning of the pollen season, then there is an increased risk of nasal allergies and asthma. Caesarean section is a risk factor for infants developing allergies especially if the mother is allergic. Saturated fat intake during breastfeeding is a risk factor for atopic sensitisation. The maternal diet should thus be supplemented with omega 3 and polyunsaturated fish oils.

High maternal exposure to volatile organic compounds (VOCs) found in smoke, new carpets and after recent home renovation may increase atopic diseases in their offspring.

Reducing the risk of allergies in childhood

Plan breastfeeding carefully! The best scenario is exclusive breastfeeding with no top-up formula feeds in a mother who pays special attention to her own diet. No half measures! Although breastfeeding is the recommended form of infant feeding as it provides the best nutrients and immune protection, we must warn breastfeeding mothers to strictly avoid all allergy-provoking foods in their own diet. Traces of these allergy provoking foods can be found in the mother's breast milk shortly after eating them and this could possibly lead to allergic sensitisation in the baby.² Also warn against use of nipple creams that contain peanut (Arachis) or nut oil extracts, as these may also lead to nut sensitisation in the baby.

Paradoxically, a home environment that is meticulously sterile and contains no animals at all might actually promote allergy development in the newborn. This is the basis of the 'hygiene hypothesis'. The 'dirtier' the infant's initial environment, the less likely that allergies will develop! We find that babies born into large families, with early exposure to usual childhood viruses and

Correspondence: Dr A Morris, 303 Library Gardens, Wilderness Road, Claremont 7708. Tel 021- 674-3637, e-mail adrianm1@telkomsa.net

those born on livestock farms are less likely to develop allergies. Those born into families with only a few siblings and no exposure to dirt or animals, or infants exposed to antibiotics early in life are more prone to develop allergies. Early exposure to day-care environments at a few weeks of age, may also reduce allergies. There is no evidence that childhood immunisations are detrimental or promote allergy development; and the converse may be true with BCG immunisation conferring some allergy protective effect. Natural bowel flora such as lactobacilli and bifidobacteria seem to have an allergy-protective effect. 'Good' maternal bowel flora may enhance the establishment of similar neonatal flora through vaginal delivery and first nursing and reduce the risk of allergy development. Atopic populations have a higher prevalence of gut colonisation with clostridia, coliforms and staphylococcal bacteria versus non-allergic populations with lactobacilli and bifidobacteria.

Special attention should be given to protecting the newborn from allergens. We recommend liberal use of bland emollients on the skin, avoiding perfumed soaps, lanolin and all biological detergents. Cotton clothing and mittens are preferable to synthetic and woollen clothes. Bath additives and bubble baths should be avoided; only use products such as oilatum in the bath. Carefully read labels and avoid vitamins and medications with added colours. Even herbal or so-called 'natural' medications should be viewed with suspicion, as these are possible sensitising agents.

Do's and don'ts of pregnancy in allergy-prone mothers

Pregnant mothers should:

- Not smoke cigarettes and avoid passive smoking.
- Avoid excessive alcohol intake.
- Consider avoiding allergy-provoking foods such as peanuts, nuts, sesame, eggs and fish in the last trimester of pregnancy.
- Avoid excessive exposure to pets such as cats, dogs and horses, as well as house dust.

Continue to take regular prescribed preventer and reliever asthma medication throughout pregnancy. The reliever beta-agonists actually help to relax the uterine muscles. Medication such as aspirin, beta-blocker medication and codeine are other possible allergy co-factors.

Avoid all non-prescription drugs and vitamins that contain colourings or additives.

We recommend avoiding any allergy-provocative procedures in pregnancy such as skin-prick testing or desensitisation immunotherapy.

Take probiotic (lactobacillus GG) and prebiotic supplements during pregnancy.

Pregnant women should continue to exercise, eat a balanced diet and get plenty of sleep.

Newborn babies should:

Be exclusively breastfed for 6 months if possible.

Not be exposed to cow's milk and formula milk unless clinically documented hypo-allergenic formulas are used.

Be exposed to normal childhood viruses.

Not receive antibiotic treatment for viral illnesses unless absolutely essential.

Not be exposed to creams containing nut oils, perfume and additives.

Not be fed processed baby foods but should rather eat freshly prepared foods from the age of 6 months; and continue to avoid nuts and peanuts until age 3 years.

Not be exposed to any passive cigarette smoke.

Immunisations should be given as usual.

REFERENCES

1. Authors? Intervention during pregnancy and allergic disease in the offspring. *Paediatr Allergy Immunol* 2005; **16**: 558-566.
2. Chandra RK, Puri S, Hamad A. Influence of maternal diet during lactation and use of formula feeds on development of atopic eczema in high risk infants. *BMJ* 1989; **299**: 228-230.



Pregnant 1



Pregnant 3



Pregnant 2