CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

Available online at: http://www.iajps.com *Review Article*

ASTHMA AND ALLERGIC DISEASES DURING PREGNANCY

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Article Received: May 2020 **Accepted:** June2020 **Published:** July 2020

Abstract:
Allergic symptoms are observed in every fifth pregnant woman, and the most common reactions are in the form of asthma and rhinitis. Allergies can be present before pregnancy and are often promoted through pregnancy. It is important to carefully diagnose allergies and asthma and manage them as it adversely impacts both the mother and the baby.
For allergic diagnosis, it is preferred to carry out an anamnestic investigation and in vitro testing. The skin testing and provocation tests are usually preferred to be done after the childbirth. It is imperative to avoid consumption and exposure to confirm allergens and initiate allergen immunotherapy during pregnancy. Patients who were already having immunotherapy before pregnancy, must continue and maintain their treatment. However, the allergen dose must not be increased further. It is important to carefully prescribe the symptomatic medications and their doses to prevent any future complications.

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Please cite this article in press Mohammad Waleed Bin Fawad et al, ***Asthma And Allergic Diseases During Pregnancy.,*** *Indo Am. J. P. Sci, 2020; 07(07).*

INTRODUCTION:

About 18- 29% of pregnant females suffer from allergic diseases. They might have pre-pregnancy allergic issues and pregnancy enhance/ promotes those issues. Almost 20% of allergic reactions are in the form of asthma and rhinitis. These two can often present within the same individual. Moreover, there are some other medical conditions aggravate the complications during pregnancy, it includes acute urticaria, food allergy, anaphylaxis, drug allergy, and allergic conjunctivitis. [1]

Optimal management of these disorders is necessary during pregnancy to ensure the safety of the mother and the baby. In this research paper, recommendations for diagnosis, management, and therapy are given to allergic issues in pregnant or lactating females along with some risk factors and preventive measurements. [2]

Diagnosis of Allergy During Pregnancy

Detailed medical history and symptom analysis are important for the diagnosis of allergy in pregnant women. In this scenario following two things are helpful for monitoring:

- A diary of allergic symptoms
- Monitoring of changes in allergic symptoms and avoidance of suspected allergens

It has to be emphasized that the rigid elimination diet is extremely dangerous for the diagnosis of allergy in the mother as it could negatively influence the nutritional status and lead to severe deficiencies. [3, 4]

There are some diagnostic tools that are preferred to be postponed till childbirth as in some cases they can cause anaphylactic reactions. Those tools include serologic tests for allergen-specific IgE, e.g RAST (radioallergosorbent test) or ImmunoCAP, test for IV allergy diagnosis like the lymphocyte transformation test which falls under the skin and provocation test categories. The same rule goes for food and other similar challenge tests. Though it is observed that patch testing doesn't cause harmful effects on the patient, but physicians usually prefer to deter the testing to prevent any immunological changes due to pregnancy. [5]

Management of Allergic Diseases During Pregnancy

It is advised to avoid contact, consumption, or exposure to all those products that contain specific allergens. Inhalation of any potent, like house dust, animal dander, tobacco smoke, and irritating pollutants, can trigger asthma and other allergic reactions so it is better to avoid them. [6]

During pregnancy, the body goes through several systematic changes and it reacts in several different ways, so physicians prefer not to ideally initiate the allergen immunotherapy like AIT, SIT, and SLIT before childbirth. However, if pregnant patients have anaphylaxis triggered by Hymenoptera (insect venom) hypersensitivity, and they are at high clinical risk, then the initiation of immunotherapy must be considered. It is safe to continue the therapy in pregnant patients who were already having pre-pregnancy therapies, but the dose of the allergen should not be increased. During the build-up phase of immunotherapy, the patient is on a low dose which isn't therapeutic, and the patient conceives then the therapy could be discontinued. [7] Newer studies have revealed an egregious side of immunotherapy. These indicate that immunotherapy is found responsible for the worsening of the allergic disease in some pregnant ladies, and the treatment was also found to prevent allergic sensitization in the child. However, a more in-depth study is required in this niche. [8]

Medication for Asthma and Allergy in Pregnancy

During the first trimester, the ideal situation is 'no pharmacologic therapy'. However, patients with medical disorders, medications must be considered to minimize the deleterious impacts upon the mother and the unborn. For example, women with asthma require medicine to prevent any life-threatening situations during pregnancy, as exacerbations might cause gestational diabetes, pre-eclampsia, placenta praevia, and placental abruption. [9]

Some studies have shown that infants of mothers administrated with corticosteroids have an increased risk of oral clefts, preterm birth, preeclampsia, and lower birth weight. Many other studies have shown that an association between these risks did not provide information on dose, indication, or duration. However, it was also found in some cases that, administration of corticosteroids at higher doses for longer periods was associated with low birth weight, preterm delivery, and OCS.

Table: Recommendations for asthma and allergy in pregnant patients

Drug	Safety Data
Inhaled bronchodilators like Formoterol, Salmeterol, and Albuterol	Generally, assure for long and short-acting bronchodilators
Theophylline	Serum levels must be closely monitored to avoid toxicity
Systematic corticosteroids	Data shows increase risk of oral clefts. Low birth weight, preeclampsia, and intrauterine growth retardation are also observed
Leukotriene Receptor antagonist	Data is generally reassuring
5-Lipoxygenase-Inhibitor	Usually avoided during pregnancy due to less reassuring data
Omalizumab	High risk of low birth weight and preterm birth
Common allergic rhinitis medications and safety data	
Oral antihistamines (e.g. Azelastine, Cetirizine, Chlorpheniramine, Fexofenadine, Diphenhydramine, Dexchlorpheniramine, Hydroxyzine, Loratadine)	Data is generally reassuring. Hydroxyzine should be cautiously administered. Fexofenadine is an active metabolite: no reports of congenital malformations. However, less supportive data are available
Oral and Nasal Decongestants (e.g. Oxymetazoline, Phenylephrine, Phenylpropanolamine, Pseudoephedrine)	Following should be avoided during pregnancy: • Oxymetazoline as it is associated with possible uteroplacental insufficiency • Phenylephrine, as it is linked with clubfoot and eye/ ear malformations • Phenylpropanolamine associated with gastroschisis, ventricular septal defect and congenital malformations • Pseudoephedrine which is linked with gastroschisis, small intestinal atresia and hemifaccial microsomia
Intranasal Antihistamines (e.g. Azelastine, Olapatadine)	Studies are reassuring
Intranasal Corticosteroids (e.g. Budesonide, Triamcinolone, Fluticasone,Mometasone)	At high dose, risk of increased malformation. Administration depends upon the severity of allergic rhinitis

Treatment of Acute Asthma

Treatment of acute asthma is similar to the treatment for non-pregnant patients. It includes inhaled oxygen (essential), beta2 agonists, and corticosteroids (parenteral or oral). Nebulized ipratropium bromide is also advised to add if the patients do not respond to beta2 agonists. Intravenous aminophylline is not given to patients in emergencies, but if the patients are hospitalized for acute asthma then carefully administered levels can be given. As an adjunct to inhaled beta2 agonists and corticosteroids, intravenous magnesium sulfate might be beneficial in acute-severe asthma.

The goals of this treatment include the improvement of quality of life, prevention of severe exacerbations, and maintenance of normal lung functions. [12]

Treatment of Rhinitis

Significant nasal symptoms appear in almost 30% of pregnant women. During pregnancy, various hormones, directly and indirectly, interfere with the nasal blood flow and mucosal glands. The most common cause of nasal symptoms in pregnant patients are allergic rhinitis, sinusitis, rhinitis medicamentosa, and nonallergic vasomotor rhinitis. “vasomotor rhinitis of pregnancy” is also known as pregnancy rhinitis. It is a vasomotor instability and nasal congestion syndrome which is limited to the gestational period only. Allergic rhinitis co-exists with asthma, and it can either worsen the situation or remain the same during the gestation period. [13, 14]

The initial treatment steps of rhinitis in pregnant ladies are non- pharmacological. These steps include avoidance of allergens, irritants, and nasal lavages with a salty water solution. Pharmacological therapy includes antihistamines and intranasal glucocorticoids. These drugs do not carry harmful effects. Patients who require antihistamines for allergic rhinitis are usually treated with second-generation agents, as these drugs are less sedating and carry no to minimum cholinergic side effects as compared to first-generation agents. Among second-generation antihistamines, drugs like cetirizine and loratadine might also be considered as a safe choice during pregnancy. [15]

Treatment of Anaphylaxis

Its treatment for pregnant and nonpregnant patients is similar. The very first concern is the avoidance of anything that will trigger an anaphylactic reaction. For its treatment, epinephrine is promptly administered. Oxygenation and intravascular volume depletion are very important in the management of anaphylaxis which would otherwise cause complication for the fetal and the mother. It is preferable to place the hypotensive patient on their left side, this action prevents the additional hypotension which results from compression by gravid uterus on the inferior vena cava. In some cases, intravenous epinephrine may be needed. In patients with severe anaphylaxis, glucocorticoids are safe to administer, and for laryngeal spasm tracheotomy and intubation may be necessary. [16, 17]

Factors Responsible for Allergy and Asthma

- **Tobacco Exposure**

A recent study has revealed that smoke during pregnancy increases the risk of asthma, rhinitis, and the risk of eczema at later stages in babies. A blood sample of mothers who smoked during pregnancy showed that Th2 cytokines were responsible for elevated allergic reactions in the neonates. Besides, total and specific eosinophil counts, IgE levels, the incidence of airway disease, and skin issues were prominent in children who were exposed to smoke during pregnancy. [18]

- **Maternal Diet**

Several essential nutrients like Vitamin D, zinc, n-3 polyunsaturated fatty acids (PUFAs), and folate are extremely important. Data on n-3 PUFA is contrasting. For example, n-6 PUFAs in margarine and vegetable oils are more responsible for causing eczema than n-3 PUFA in fish. Studies are in favor of increased consumption of fish and fish oil to reduce the chances of allergy incidence in babies. [19] Current evidence factors the folate and folic acid supplements as they were found positively associated with atopic dermatitis in offspring. These are also helpful against allergy and atopy and reduce the risk of neural tube defects.

For pregnant and lactating mothers, in 2014 Commission of European Communities introduced 14 most allergenic foods that are important to mention on labels of all edible products. These allergen sources are fish, nuts, milk, egg, cereals with gluten, soybeans, sesame, mustard, celery, lupines, and all these products with sulfur dioxide and sulfites. Avoidance of foods that causes an allergy is extremely important for the mother to prevent any unnecessary complications.

- **Anti-acid Medication**

During pregnancy, the changing hormone levels and the growing fetus often lead to abdominal pain, heartburn, reflux, acidity, and urine issues. Almost 70% of pregnant females face these issues and 50% of them consume acid depressing medicines. However, studies show that acid suppression results in elevated stomach pH that can increase the risk of food and drug sensitization.

Sensitization of the mother due to these drugs shown an increased risk of food allergy in the mother and the fetus. It was also found associated with the increased risk of asthma in the children. So, pregnancy-related reflux should be treated with non-pharmacological measures like short meals, walking, not lying after a meal, avoiding extra sweety and fatty foods, smoking, and alcohol. [20]

- **Pets**

Studies have depicted that cat owners were associated with lower, while rabbit and rodent owners were associated with higher wheezing risk. The case was found different from the dog owners, as they were found to protect against asthma, allergic diseases, and atopic eczema. However, the discussion is under debate. It is observed that the exchange of an immunomodulatory allergen like lipocalin takes place between humans and pets. However, those who are allergic to fur are not safe around them. [21, 22]

CONCLUSION:

It is imperative to diagnose the allergens in pregnant patients, but the skin and provocation tests must be avoided. Along with the diagnosis, management, and treatment of asthma and allergy is extremely important for both the mother and the fetus. Symptomatic asthma and rhinitis treatment are necessary to ensure optimal oxygen supply. Specific allergen immunotherapy should not be initiated, but if it was ongoing before pregnancy, then dose must not be increased during pregnancy and lactation.

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