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## Pregnancy-induced rhinitis: nose problems at the obstetrician's office

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### Introduction and purpose

Pregnancy-induced rhinitis (PIR) manifests as nasal congestion, with resolution of symptoms after delivery. Pregnancy-induced rhinitis is a distinct condition from allergic rhinitis, it may not respond to treatment for allergic rhinitis. The first stage in providing adequate and effective management of PIR is to have a clear and appropriate diagnosis. Therefore, each patient-specific management of PIR must take careful consideration of a variety of circumstances.

The aim of this study was to conduct a literature review on pregnancy-induced rhinitis. A literature review was carried out in the PubMed, MEDLINE, and Scopus databases using the terms 'rhinitis and pregnancy'.

### Brief description of the state of knowledge

Physiological factors underlying PIR are not well understood at the moment. There is no single explanation for the pathophysiological mechanism that would account for the changes in PIR. Nasal congestion is the primary nasal symptom in pregnancy-

induced rhinitis. It can result in night-time mouth breathing and poor sleep quality. The mother's sleep may be negatively impacted by nasal congestion resulting in maternal hypertension, pre-eclampsia, and intrauterine growth retardation. Increasing awareness not only benefits pregnant patients' quality of life but also has a favourable impact on how a pregnancy turns out.

### **Summary**

PIR has gained relevance in recent years due to its major effects on maternal quality of life as well as the identification of a relationship with OSAS in the mother and potential harmful consequences on the foetus. The mother's quality of life is significantly impacted by PIR, as shown, thus both the otorhinolaryngologist and the obstetrician must use caution in the early identification and treatment of pregnancy-induced rhinitis.

**Key words:** Pregnancy; Rhinitis; Rhinology; Nasal obstruction

### **Introduction and purpose**

Chronic rhinitis is a common medical condition to affect pregnant women. During pregnancy, rhinitis may improve, get worse, or remain unchanged [1]. Pregnancy-induced rhinitis (PIR) is defined as nasal congestion present during the last 6 or more weeks of pregnancy without other signs of respiratory tract infection, and with no known allergic cause, disappearing completely within 2 weeks after delivery [1,2]. Nasal congestion is the primary symptom of pregnancy rhinitis, which completely resolves after delivery without any other indicators of a respiratory infection or an allergy [3]. Since pregnancy-induced rhinitis is a distinct condition from allergic rhinitis, it may not respond to treatment for allergic rhinitis [4].

Pregnancy rhinitis may have a connection to snoring, OSAS (obstructed sleep apnoea syndrome), and, less directly, preeclampsia [5]. Its correlation with intrauterine growth retardation, gestational hypertension, and lower newborn Apgar scores has been demonstrated in studies [1,2,5]. PIR is prevalent among pregnant women and has an impact on their quality of life.

The first stage in providing adequate and effective management of PIR is to have a clear and appropriate diagnosis [6]. Also, it is important to distinguish between generic "rhinitis during pregnancy" and actual pregnancy-induced rhinitis. All rhinitis forms, including allergic, drug-induced, non-allergic, and rhinitis with a vasomotor component, are together referred to as rhinitis during pregnancy and are, by definition, present before, during, and after pregnancy [7].

Therefore, each patient-specific management of PIR must take careful consideration of a variety of circumstances [4].

### **Description of the state of knowledge**

"Pregnancy-induced rhinitis" refers to chronic non-allergic rhinitis that did not exist prior to pregnancy but appears during pregnancy and totally resolves after birth [4,8]. Despite the fact that rhinitis does not pose a life-threatening risk to mother or child, it is crucial to maximise treatment because it may have a significant impact on the patient's quality of life [3,4]. PIR is classified as a hormonal rhinitis, caused by hormonal imbalances during menstrual cycles, puberty, pregnancy, menopause, and specific endocrine disorders like hypothyroidism and acromegaly, according to Non-allergic rhinitis: Position paper of the European Academy of Allergy and Clinical Immunology [1,9]. Comparing late pregnancy (the month before birth) to early pregnancy (15–18 weeks), researchers discovered a propensity for late pregnancy's nasal congestion to be more severe [3,10].

Nasal obstruction during the last six or more weeks of pregnancy and complete resolution within two weeks of delivery are the defining characteristics of pregnancy-induced rhinitis [5,6,8]. Pregnancy-induced rhinitis is defined as nasal obstruction, which usually occurs in the second or third trimester, lasts longer than six weeks, has no allergic cause or symptoms of upper respiratory tract infection, and resolves completely within two weeks of delivery. PIR is not present prior to pregnancy [6,8]. The diagnosis is clinical, and it can only be surmised based on how severe the symptoms of nasal blockage are in pregnant women (symptoms that have never

occurred before) [5,6]. Given that this is a change that is a natural component of pregnancy physiology, it is crucial to be cautious when applying the nasal obstruction criteria to pregnant women, only evaluating as positive a deteriorating trend or a symptom that has a major impact on patient quality of life [6]. Rhinitis is reported by 20–40% of reproductive women, and 10–30% of these patients experience worsening symptoms during pregnancy [11]. PIR prevalence varies significantly in literature, ranging from less than 10% to approximately 50% [1,8]. The prevalence of PIR was found to be 22% in the population-based multicentre cross-sectional questionnaire survey study with 599 individuals (excluding everyone who had nasal problems previous to pregnancy) [8,10]. The most recent study included 681 women and discovered that the prevalence of PIR was 32% [1]. High diversity in incidence and morbidity rates suggests that this disease entity is challenging to assess and define. Allergic rhinitis, drug-induced rhinitis, acute or subacute upper respiratory tract infection, gestational granuloma, and sinusitis are all included in the differential diagnosis [5,6].

Nasal congestion is the primary nasal symptom in pregnancy induced rhinitis. It can result in night-time mouth breathing and poor sleep quality [11]. Patients with PIR frequently appear with other symptoms include rhinorrhoea, post-nasal secretion, hyposmia, itchy nose, serial sneezing and headache [1]. Several causes contribute to nasal congestion, including an increase in blood pooling, a decline in vasomotor tone, and oedema brought on by plasma leakage into the nasal stroma [8]. The mother's sleep may be negatively impacted by nasal congestion. It could also be connected to snoring or obstructive sleep apnoea (OSA) [12]. Maternal hypertension, pre-eclampsia, and intrauterine growth retardation are all thought to be profoundly influenced by OSA [6,8,12–14]. Moreover, pregnant women with rhinosinusitis experience worse quality of life (QOL) in the third trimester compared to those without the condition [3].

Physiological factors underlying PIR are not well understood at the moment. There is no single explanation for the pathophysiological mechanism that would account for the changes in PIR [6,8,11].

Some data suggest that the menstrual cycle does affect nasal physiology. Pregnant women's nasal mucosa has a number of sex hormone receptors, which makes it susceptible to hormonal activity that results in mucosal congestion [1]. As the pregnancy progresses, serum progesterone and oestrogen concentrations steadily increase [1]. Oestrogen has been proposed as a potential culprit for the changes, possibly through epithelial and microvascular cells' increased expression of histamine receptors [8]. Progesterone may also contribute to the physiologically occurring local vasodilatation of the blood vessels in the nose during pregnancy by increasing the amount of blood circulating through the system [6].

Placental growth hormone is thought to be involved in the development of PIR . It has been demonstrated that acromegalics can develop polyps and mucosal hypertrophy in response to human growth hormone, which is analogous to placental growth hormone [11]. Patients with PIR had considerably greater serum levels of placental growth hormone [8]. Thus, it is thought that PIR may also be a condition where placental growth hormone stimulates mucosal growth [8,11]. However, these data are conflicting, as there have been studies demonstrating nasal obstruction improvement during the course of pregnancy in a significant number of patients [6,8].

Although hormonal changes are thought to be the cause of pregnancy-induced rhinitis, the specific pathophysiology of hormonal rhinitis is still unknown, and smoking seems to be the only known risk factor [1,9,15]. PIR was not linked to either hay fever or asthma [6,8,10].

Patient education should play a key role in a comprehensive strategy to treatment. Because symptoms of pregnant rhinitis usually resolve after delivery, most studies suggest that adequate education can be used as a primary treatment option as well as an adjunct [5,6]. Knowing that nasal congestion is a typical, self-limiting disease may give patients some reassurance. Early prenatal care patients have a lesser

tendency to use topical nasal decongestants and are less likely to experience drug-related rhinitis. The main measures that can positively reduce PIR symptoms are regular physical activity, weight control, and raising the head of the bed to an angle of 30-45 degrees may also help in improving nasal obstruction during the night [4,6,8,16].

The predicted benefit to the mother and potential harm to the growing foetus must be considered when administering medical treatment for PIR. Any medicine carries the chance of teratogenic effects on the developing human foetus. This may raise some concerns for both the patient and their physician [4]. Symptomatic alleviation may be obtained through non-medical methods such as nasal irrigation with saline solution [4,8]. Topical decongestants with a good safety profile may be used to minimize the symptoms of PIR and improve the mother's quality of life. Studies have shown that oxymetazoline can be used occasionally, at the lowest dose possible, preferably after the first trimester, and never before delivery, in one or more episodes of more severe nasal obstruction [4,6,17]. Due to the known danger of rhinitis medicamentosa, which persists after delivery, studies advise using topical nasal decongestants for no longer than five, or even three days [6,8].

Steroids applied topically are unlikely to have noticeable benefits. Data on the use of topical corticosteroids in pregnancy are limited, but fluticasone has not been shown to be helpful in the treatment of pregnancy-induced rhinitis [4,8].

The primary healthcare provider for pregnant women is their obstetrician, who may not be fully informed on sinus and nose issues. Increasing awareness not only benefits pregnant patients' quality of life but also has a favourable impact on how a pregnancy turns out [3].

## **Summary**

PIR has gained relevance in recent years due to its major effects on maternal quality of life as well as the identification of a relationship with OSAS in the mother and potential harmful consequences on the foetus. Obstetricians should be more aware of this significant illness, as should patients. The mother's quality of life is significantly

impacted by PIR, as shown, thus both the otorhinolaryngologist and the obstetrician must use caution in the early identification and treatment of PIR. In this condition, careful management aims to reduce medication exposure while maintaining maximum symptom relief and also to reduce the possibility of exposing the foetus at risk. PIR can be effectively and safely treated when necessary, however the foundation of management is educating patients about PIR's remitting nature.

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