

Pregnancy-Related Nasal Obstruction and Gestational Hypertension: An Overlooked Association

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ABSTRACT

Background: Pregnancy associated nasal obstruction seems to be a commonplace, but still neglected phenomenon during pregnancy. Ancillary studies Although always given the label of benign, substruction may affect sleep quality and oxygenation and autonomic regulation that may lead to hypertensive disorders of pregnancy. Gestational hypertension remains an important cause of maternal and perinatal morbidity, especially in low-and middle-income countries. This study aimed to determine the prevalence of pregnancy-related nasal obstruction and gestational hypertension and to examine the association between these two conditions among pregnant women.

Materials and methods: A cross-sectional analytic study was performed on 310, antenatal women attended Out-patient Department from May to December 2025. Pregnancy-related nasal congestion was identified using a structured interviewer-administered questionnaire, gestational hypertension by antenatal records and blood pressure above 20 weeks of pregnancy.

Results: The Proportions of Pregnancy-Related NAS (PR-NAS) and Gestational Hypertension (GH) were 27.1% and 9.0%, respectively. Coincidence of the two diseases was detected in approximately 6.1% of the study sample. Pregnancy-related nasal obstruction was significantly correlated with gestational hypertension ($p < 0.001$) and the odds of getting hypertension were higher in pregnant women who reported having nasal obstruction.

Conclusion: Pregnancy-related nasal obstruction is a common symptom and related significantly with gestational hypertension. These data indicate that nasal obstruction in pregnancy cannot be treated as a minor symptom.

KEY WORDS

Antenatal care; Gestational hypertension; Hypertensive disorders of pregnancy; Maternal health; Nasal obstruction; Pregnancy rhinitis; Sleep disturbance.

INTRODUCTION

Pregnancy is accompanied by numerous physiological

changes in hormones and the cardiovascular system required for fetal growth and maternal well being. These changes while adaptive, may have adverse consequences and have the propensity to predispose the woman to other widely prevalent and supposedly trivial self-limiting disorders. One such underrecognized entity is pregnancy-related nasal obstruction or pregnancy rhinitis.¹ Although perceived to be a trivial complaint, preliminary data is starting to emerge that suggests nasal obstruction in pregnancy may have systemic implications through its effects on sleep quality and oxygenation as well as sympathetic tone.²

It is estimated that 20–30% of pregnant women experience nasal obstruction during pregnancy and symptoms usually first manifest between the second and third trimesters.³ Hormonal changes of specially estrogen and progesterone result in-vascular congestion, mucosal oedema and hypertrophy of nasal glands.^{4,5} Gestational hypertension, which is new-onset elevated blood pressure that emerges after 20 weeks gestation in women who were previously normotensive, is a significant cause of maternal and perinatal morbidity globally.⁶ It occurs in 5–10% of pregnancies and is linked to an increased likelihood of developing preeclampsia, placental abruption, preterm birth, and long-term cardiovascular disease in mothers.^{7,8}

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In non-pregnant groups, upper airway obstruction such as nasal congestion has been associated with sleep-disordered breathing, intermittent hypoxia and increased blood pressure through pathways that include sympathetic overactivity, endothelial dysfunction and systemic inflammation.⁹ Analogous processes might be working during the pregnant condition, which is well known to involve elevated cardiovascular demand and deranged autonomic control.¹⁰

Sleep disturbances are being recognized more and more as a significant, yet underestimated risk factor for onset of adverse outcomes during pregnancy. Sleep of poor quality, inadequate duration and sleep disordered breathing in pregnancy has been linked with gestational hypertension, preeclampsia and gestational diabetes mellitus.^{11,12} Nasal obstruction is a key factor contributing to sleep disruption as this increases airway resistance and leads to mouth breathing, snoring and disturbance of sleep architecture.¹³

In clinical terms, the putative link between nasal obstruction in pregnancy and gestational hypertension assumes crucial value since a cause-and-effect relationship has treatable implications. These are simple interventions, including saline nasal irrigation, positional therapy and avoiding unnecessary topical decongestants that can help improve nasal airflow as well as sleep quality with no harm to the fetus.¹⁴

In low- and middle-income countries, where it may not be possible to access specialized obstetric and sleep medicine services missed symptoms such as nasal obstruction can have a more insidious effect on maternal outcomes. Pregnancy hypertensive disorders continue to be a leading cause of maternal death within these settings and understanding all potential contributing factors is important; including those usually considered as minor or unrelated.¹⁵

Considering the high prevalence of pregnancy-related nasal obstruction and the considerable burden of gestational hypertension, a potential relationship between these 2 disorders demands investigation at such time. This study was conceived to fill this void, focusing on the prevalence and concurrence of PRNO or GH and also on their possible correlation. The purpose of the study was to examine the association between pregnancy-related nasal obstruction and gestational hypertension among pregnant women.

MATERIALS AND METHODS

A hospital-based cross-sectional analytical study was conducted to examine the association between pregnancy-related nasal obstruction and gestational hypertension during the period from May to December 2025.

The study was conducted in the antenatal care outpatient department of a tertiary-level hospital in Bangladesh.

The study included pregnant women attending the antenatal care clinic with a gestational age of 20 weeks or more.

A total of 310 participants were selected using a consecutive sampling technique based on calculated prevalence and a 95% confidence level.

Inclusion and Exclusion Criteria

The study population included pregnant women over 18 years old with a gestational age of >20 weeks who were willing to give an informed consent. Women with preexisting chronic hypertension diagnosed before pregnancy, documented allergic rhinitis or history of chronic sinusitis and acute upper respiratory tract infection at the time of evaluation were excluded. Women with multifetal gestations or prior serious medical conditions like chronic kidney disease or cardiac illness were also excluded to minimize confounding influences.

Data were collected using a structured interviewer-administered questionnaire, and blood pressure was measured from antenatal records following standard procedures.

The exposure variable was pregnancy-related nasal obstruction and the outcome variable was gestational hypertension, along with selected socio-demographic and obstetric variables.

Data were analyzed using statistical software with descriptive statistics and chi-square test, considering $p < 0.05$ as significant. Ethical approval was obtained and informed consent, confidentiality and voluntary participation were ensured.

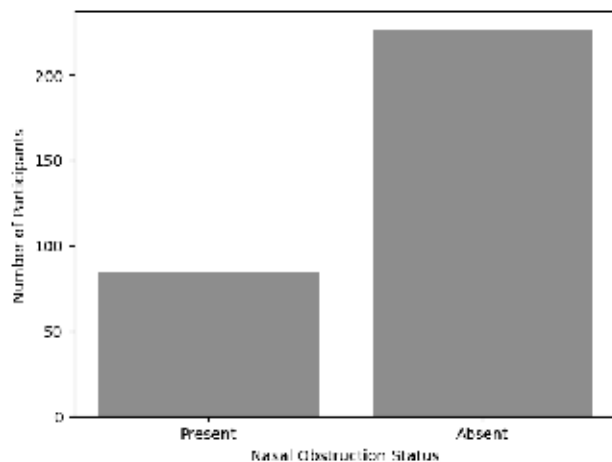
RESULTS

Among the 310 pregnant women sampled, 84 (27.1%) were found to have pregnancy related nasal obstruction. Two hundred and twenty-six (72.9%) of these participants claimed they did not have nasal obstruction during pregnancy.

These observations reveal that nasal obstruction during pregnancy has already occurred in over 25% of the population studied, suggesting this symptom is not uncommon among pregnant women. Despite being considered as a trivial or transient symptom, the number of symptomatic cases found indicates that pregnancy-related nasal obstruction is a relevant maternal health problem which deserves clinical attention during antenatal care.

Table I Prevalence of Pregnancy-Related Nasal Obstruction

Nasal Obstruction Status	Frequency (n)	Percentage (%)
Present	84	27.1
Absent	226	72.9
Total	310	100.0

**Figure 1** Distribution of Pregnancy-Related Nasal Obstruction

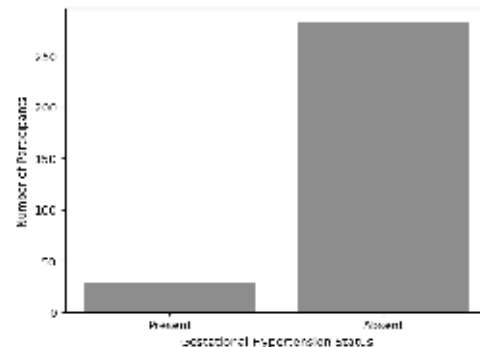
There are 2 categories in a bar chart namely "Present" and "Absent". The height of the bar showing nasal obstruction present represents 27.1%, that for absence is 72.9%. This Figure illustrates the visual difference of proportion of study participants who did not and those who reported nasal obstruction, there were few cases where this condition was absent thus making it easy to discern that many remained, but not many experienced this during pregnancy.

Of the 310 pregnant women in this study, 28 of them diagnosed with gestational hypertension provided an overall prevalence of 9.0%. The other 282 (91.0%) subjects were normotensive during or after the 20th week of pregnancy.

The result shows almost 1 in 10 pregnant women in the population suffered from gestational hypertension. While most women were normotensive, the high prevalence observed highlights the clinical relevance of measuring blood pressure on a regular basis as part of antenatal care, due to known maternal and fetal risks associated with hypertensive disorders in pregnancy.

Table II Prevalence of Gestational Hypertension among Study Participants

Gestational Hypertension Status	Frequency (n)	Percentage (%)
Present	28	9.0
Absent	282	91.0
Total	310	100.0

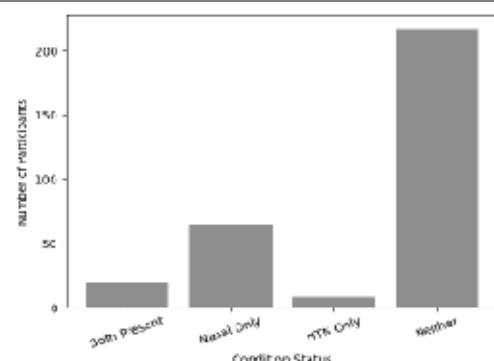
**Figure 2** Distribution of Gestational Hypertension

Bar chart showing the distribution of gestational hypertension among the study participants, comparing the proportion of women with and without gestational hypertension during pregnancy.

Cohabitants of 19 patients (6.1%) were determined to have simultaneous pregnancy related nasal obstruction and gestational hypertension. An additional analysis indicated that 65 (21.0%) women suffered from pregnancy-associated nasal obstruction without suffering from gestational hypertension, and a total of 9 who had gestational hypertension but no nasal obstruction. Most of the study sample, 217 (70.0%) did not have either disorder. They also show that a substantial proportion of pregnant women had both nasal obstruction and gestational hypertension simultaneously, endorsing investigation on any possible overlap between diseases.

Table III Co-occurrence of Pregnancy-Related Nasal Obstruction and Gestational Hypertension

Nasal Obstruction	Gestational Hypertension	Frequency (n)	Percentage (%)
Present	Present	19	6.1
Present	Absent	65	21.0
Absent	Present	9	2.9
Absent	Absent	217	70.0
Total		310	100.0

**Figure 3** Co-occurrence of Nasal Obstruction and Gestational Hypertension

Bar chart showing the distribution of participants according to the presence or absence of pregnancy-related nasal obstruction and gestational hypertension, highlighting the proportion of women experiencing both conditions concurrently.

Pregnancy-related nasal obstruction was significantly associated with gestational hypertension. Among women with nasal obstruction, 19/84 (22.6%) had gestational hypertension and among those without nasal obstruction, 9/226 (4.0%) had gestational hypertension. The proportion ratios between these two estimates suggest that women with nasal obstruction had a higher prevalence of gestational hypertension.

This relationship was statistically significant according to the chi-square test ($\chi^2 = 25.89$, $df = 1$, $p < 0.001$). Participants with pregnancy-related NA had 7 times higher chances of gestational hypertension when compared to those without any NA (OR = 7.05, 95% CI: 3.04–16.33).

Table IV Association between Pregnancy-Related Nasal Obstruction and Gestational Hypertension

Nasal Obstruction	Gestational Hypertension: Yes	Gestational Hypertension: No	Total
Yes	19 (22.6%)	65 (77.4%)	84 (100%)
No	9 (4.0%)	217 (96.0%)	226 (100%)
Total	28	282	310

Statistical test: Pearson chi-square (2×2)

$\chi^2 = 25.89$, $p < 0.001$; OR = 7.05 (95% CI: 3.04–16.33).

DISCUSSION

The present study explored the connection between nasal congestion in pregnancy and gestationally hypertensive pregnant women undergoing antenatal care. The findings showed that 27.1% of the respondents had nasal congestion during pregnancy and 9.0% had gestational hypertension. Moreover, 6.1 percent of the women had the two conditions at the same time. The most noteworthy was the fact that gestational hypertension was much more prevalent in women with nasal obstruction as compared to women without nasal obstruction. Nasal women were almost seven times more likely to experience gestational hypertension (OR = 7.05, 95% CI: 3.04-16.33) which was statistically significant ($p < 0.001$). The specified results suggest that nasal congestion during pregnancy may not be an inconvenience insignificant, but it might have a clinical significance to the cardiovascular well-being of the mother.

The findings of this research of high incidence of nasal obstruction in pregnancy are consistent with other studies that have reported nasal congestion to be a popular symptom during pregnancy especially in the second and the third trimester.^{1,2,4} The hormone changes previously recorded, particularly the increase of estrogen and progesterone, may cause mucosal edema, vasculature engorgement and glandular hypertrophy, which ultimately causes a reduction in nasal airflow.^{1,2,9} The prevalence in the current study is thus well within the wide scope that is already established in previous studies.^{2,4,8} The reason why this agreement is associated with the outcomes of the previous study is that the current finding is more valid and the burden of nasal symptoms during pregnancy is not negligible and cannot be disregarded in the course of the routine antenatal examination.

The prevalence of gestational hypertension in the study is also 9.0% which is comparable to the prevalence of 5-10% that has been reported to be prevalent in pregnancy.^{6,7} This implies that the study population is representative of the overall clinical trend of hypertensive disorders in the antenatal care. Because gestational hypertension is one of the primary causes of maternal and perinatal morbidity, it is extremely vital to determine the factors linked with it, which might be altered.^{6,7} In this respect, the present study can provide useful evidence as it indicates pregnancy-related nasal obstruction as a possible correlate of hypertensive risk.

This study has an advantage in revealing an apparent difference in gestational hypertension between the women who had nasal obstruction and those who did not. Gestational hypertension was found in 22.6% of women with nasal obstruction, and 4.0% of women without nasal obstruction. This significant difference renders the finding relevant as it is not only statistically significant, but also clinically relevant. This result is significant because the association was demonstrated through co-occurrence analysis and chi-square test and the odds ratio showed that there was a high risk. Even though in cross-sectional study, there is no possibility of a causal relationship, the strength of the relationship suggests the association cannot be as a result of chance alone.

The present finding is also biologically plausible. Past experience indicates that unremitting nasal congestion might enhance upper airway resistance, encourage mouth breathing, aggravate snoring and disrupt sleep quality.^{1,2,6} Sympathetic activation, intermittent hypoxia, endothelial dysfunction and inflammatory alterations have been implicated to cause sleep disruption and sleep-disordered breathing during pregnancy and could

contribute to high blood pressure.^{9,10,12,14} The present finding is therefore similar to the past findings in which the symptoms of upper airways and sleep breathing problems might be the cause of hypertensive disorders of pregnancy.^{6,9,12} The study is important in that most of the past studies focused on snoring or obstructive sleep apnea but the current study focuses on the nasal obstruction as a past and more observable symptom.

The second valuable contribution of the study is that the study is clinically relevant. Nasal obstruction during pregnancy is often considered as a non-dangerous and transient symptom, therefore, it may be underreported by women and under-diagnosed by medical professionals.^{1,7} Non-pharmacological measures, such as saline nasal irrigation, positional counseling, and sleep hygiene counseling, are other supportive techniques that could be applied to symptomatic women.^{3,7}

LIMITATIONS

This study was cross-sectional, so causality cannot be established.

CONCLUSION

In summary, these observed associations emphasize the significance of acknowledging pregnancy-related nasal obstruction as a pertinent maternal health concern and underscore the necessity of additional prospective.

RECOMMENDATION

Longitudinal and multi-center studies to elucidate underlying causal pathways along with explorations focused on whether targeted interventions for nasal obstruction may help prevent or mitigate gestational hypertension.

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DISCLOSURE

All of the authors declared no competing interests.

REFERENCES

1. Caparroz FA, Gregorio LL, Bongiovanni G, Izu SC, Kosugi EM. Rhinitis and pregnancy: Literature review. *Braz J Otorhinolaryngol*. 2015;82(1):105–111. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9444647/>.

2. Dumitru CS, Stanescu AMA, Popescu FD, et al. Pregnancy rhinitis: Pathophysiological mechanisms and clinical implications. *Life (Basel)*. 2025;15(8):1166. <https://www.mdpi.com/2075-1729/15/8/1166>.

3. Poerbonegoro NL. Nasal congestion and its management in pregnancy rhinitis. *Int J Gynecol Obstet*. 2019. <https://inajog.com/index.php/journal/article/view/977>.

4. Al-Ani RM, Alaqeedy AA, Rashid RA. Prevalence and risk factors of pregnancy rhinitis at Tikrit General Hospital, Iraq. *Egypt J Otolaryngol*. 2022;38:153. <https://link.springer.com/article/10.1186/s43163-022-00344-5>.

5. Yaghoubi F et al. The impact of pregnancy associated hormonal changes on nasal symptoms. *Otolaryngol J*. 2024. <https://journals.sbm.ac.ir/Otolaryngology/article/download/47408/34308/243244>.

6. Almuzaini HI, Alqahtani AS, Alshammari SA et al. Prevalence and sociodemographic risk factors of rhinitis in pregnancy. *Medicine (Baltimore)*. 2025;104(12):e41234. https://journals.lww.com/md-journal/fulltext/2025/12190/prevalence_and_sociodemographic_risk_factors_of.62.aspx.

7. Cleveland Clinic. Pregnancy Rhinitis — clinical overview of sinus congestion during pregnancy. Cleveland Clinic Health Library. 2024. <https://my.clevelandclinic.org/health/diseases/23084-pregnancy-rhinitis>.

8. Ellegård E, Hellgren M, Torén K, Karlsson G. The incidence of pregnancy rhinitis. *Gynecol Obstet Invest*. 2000;49(2):98–101.

9. Demir U et al. The effects of pregnancy on nasal physiology and congestion. *Int Forum Allergy Rhinol*. 2015;5(10):890–895. <https://onlinelibrary.wiley.com/doi/abs/10.1002/alr.21438>.

10. Hypertension in Pregnancy - Journal overview. (Journal covering gestational hypertension research). https://en.wikipedia.org/wiki/Hypertension_in_Pregnancy_%28journal%29.

11. Ellegard E, Karlsson G. Nasal congestion during pregnancy: Clinical insights (cohort). *Clin Otolaryngol*. 1999;24(4):307–311.

12. Allergy Ireland. Pregnancy Rhinitis and its indirect implications, including hypertension associations. Allergy Ireland. 2021. <https://www.allergy-ireland.ie/media-publications/pregnancy-rhinitis>.

13. International Journal of Applied Research – Obstetrics & Gynaecology paper: Association between gestational rhinitis and pregnancy-induced hypertension/pre-eclampsia. 2019.

https://www.worldwidejournals.com/indian-journal-of-applied-research-%28IJAR%29/recent_issues_-pdf/2019/July/July_2019_1561802706_7308249.pdf.

14. Verywell Health overview. Congestion and other nasal symptoms during pregnancy. (Contextual summary of prevalence).

<https://www.verywellhealth.com/congestion-and-nasal-symptoms-during-pregnancy-1192180>.

15. International Journal of Pharmaceutical and Clinical Research incidence of pregnancy rhinitis using NOSE/VAS symptom scales (India cohort).

<https://impactfactor.org/PDF/IJPCR/16/IJPCR%2CVol16%2CIssue1%2CArticle1.pdf>.