

Treating Rhinitis During Pregnancy: SinuSonic's Non-Invasive Alternative to Pharmaceutical Intervention

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As many as one in three pregnant women experience persistent nasal congestion in the first, third, and sometimes second trimester.^{1, 2, 3, 4} Notable research suggests that chronic nasal rhinitis, often described as "stuffiness," leads to an overall increase in sleep disturbances such as snoring and reduces the quality of life.^{1, 4, 5} Finding appropriate treatment options for nasal symptom relief is especially difficult for pregnant women, as many hope to avoid chronic use of medications that might impact the mother and fetus.^{6, 7} SinuSonic, a non-invasive treatment method, uses acoustic vibrations and comfortable pressure to relieve nasal congestion by harnessing the body's own properties.⁸ Women concerned about taking medications to address persistent congestion during their pregnancy may find in SinuSonic an attractive alternative to pharmaceutical interventions.

RISKS AND DISCOMFORTS

As research suggests, hormonal changes during pregnancy create nasal swelling and secretion, which induces problematic symptoms such as congestion.^{6, 9, 10} In addition to contributing to more frequent anxiety, poor concentration, and headaches for pregnant women, nasal stuffiness is of concern for several reasons.^{4, 5} A prominent

publisher in the field of pregnancy rhinitis, Eva Ellegård, summarized the issue in 2004 by stating, "Effects of pregnancy rhinitis on the fetus seem to be connected with the mother's sleep... Difficulty breathing through the nose increases the tendency to revert to mouth breathing and snoring."⁹ Although Ellegård's work is reputable, the connection between nasal stuffiness and its effects on pregnant women remains relatively understudied.

However, a 2000 study published in the peer-reviewed medical journal *Chest* involved administering a questionnaire to 502 women on the day they were admitted to the hospital to give birth.^{9, 10} Of the 502 women, 7% stated that they either started snoring or that their snoring markedly increased during their first trimester; 6% noticed increased snoring in their second trimester; and 24% during their third trimester. In the last week before delivery, 23% of the 502 women reported that they snored every night or almost every night – these women were classified as *habitual snorers*. The data from the study showed "Fourteen percent of the women who snored habitually had pregnancy-induced hypertension as compared with 6% of the nonsnorers ($p < 0.01$). Ten percent of the women who snored met the definition of preeclampsia with hypertension and proteinuria as compared with 4% of the nonsnorers ($p = 0.05$). All the patients with preeclampsia who

snored habitually during the last week of pregnancy had started to snore during the pregnancy and before any sign of preeclampsia was present.”¹⁰ Additionally, habitual snorers had “a significantly higher frequency” of intrauterine growth retardation and were given lower APGAR scores at birth.^{9, 10}

SINUSONIC AS A TREATMENT

Several other reputable studies showed what Ellegård reported: difficulty breathing through the nose can lead to mouth breathing, and mouth-breathing can contribute to snoring. During pregnancy, habitual snoring creates higher risks for developing hypertension, pre-eclampsia, intrauterine growth retardation, and even low APGAR scores.^{4, 10, 11} For pregnant women who are sometimes told that nasal stuffiness is yet another symptom they must endure during an often arduous nine months, SinuSonic may bring relief in the form of an alternative solution to recurrent congestion. The SinuSonic device is complementary to other safe alternatives such as saline sprays and making bed modifications to prevent snoring.^{6, 8}

SinuSonic is the first-ever patented mechanism that utilizes acoustic vibrations and positive expiratory pressure (PEP) to relieve nasal congestion.⁸ The effectiveness of SinuSonic is demonstrated in a study published in the *International Forum of Allergy & Rhinology*, a peer-reviewed scientific journal, and the Official Journal of

the American Rhinologic Society and the American Academy of Otolaryngic Allergy.

NITRIC OXIDE

SinuSonic was designed to deliver acoustic energy at 128 Hz – a frequency demonstrated to release optimal amounts of nasal nitric oxide. We know nasal nitric oxide is a valuable immune-boosting molecule produced in the nasal cavity and sinuses in pregnant and non-pregnant people alike.^{12, 13, 14} By stimulating ciliary movement, nitric oxide assists in transporting mucus up and out of the respiratory tracts.^{13, 14} Interestingly, a 2018 minireview of pregnancy rhinitis literature also mentioned nitric oxide: “It seems that because most of the inspired nitric oxide (NO) is produced in the maxillary sinus and it increases pulmonary oxygenation, by reducing pulmonary vascular residence, mouth breathing reduces NO inhalation and so it affects oxygenation also in the fetus.”¹¹

Using SinuSonic to relieve congestion, for three minutes, twice a day, is relatively simple. The device is lightweight and hand-held. A woman can hold the SinuSonic gently against her face as a soft, flexible mask covers her nose. After pressing the trigger button, users can breathe normally – through the nose if possible, through the mouth if not – as the battery-powered device delivers acoustic vibration to the upper airway. The battery in the device lasts up to 1,080 minutes of use, or six months, upon pulling the activation tab.

SinuSonic use was found to result in significant

improvements in peak nasal inspiratory flow (PNIF), an objective outcome that uses a meter instrument to calculate nasal airflow during maximal inspiration (the inhaling of air). More than 80 percent of study patients also experienced clinically and statistically significant improvements in self-reported nasal congestion scores upon first using SinuSonic and after five weeks of using the device, twice daily. Scientifically validated measures such as the Total Nasal Symptom Score (TNSS), Nasal Obstruction and Septoplasty Effectiveness scale (NOSE), and the 22-item Sinonasal Outcome Test (SNOT-22) survey were conducted to complement the objective PNIF findings – all showed statistically significant improvement in nasal symptoms. After the trial study, nearly 88 percent of patients mentioned that they would recommend SinuSonic to a friend or family member.⁸

CONCLUSION

SinuSonic may help improve quality of life during pregnancy for those who experience rhinitis. Although rhinitis of pregnancy usually resolves in the first few weeks after delivery, for those women whose symptoms do persist, SinuSonic may also be a great option after pregnancy. This is particularly true for women who are breastfeeding, as common rhinitis medications can diminish milk supply or even pass into breastmilk. SinuSonic uses acoustic vibrations to provide non-pharmacological therapeutic relief to nasal stuffiness, its risks and

discomfort, during and after pregnancy. As is true with all treatments, pregnant women are strongly encouraged to discuss SinuSonic with their obstetric providers prior to use.

REFERENCES

1. Baudoin T, Šimunjak T, Bacan N, et al. Redefining pregnancy-induced rhinitis. *Am J Rhinol Allergy*. 2020;1-8. doi:1945892420957490.
2. Naz F, Malik KI, Bhutta ZI, et al. Pregnancy induced rhinitis. *Ann King Edward Med Univ*. 2016;16:10.
3. Filiz R, Ural A, Mehmet A, et al. Investigation of the presence of pregnancy rhinitis in the third trimester with rhinomanometry. *Exp Biomed Res*. 2021;4(1):65-71. doi:10.30714/j-ebr.2021165783
4. Poerbonegoro, NL. Nasal congestion and its management in pregnancy rhinitis. *Indones J Obstet Gynecol*. 2019;7(4):320-328.
5. Kellie FJ. Non-surgical interventions for nasal congestion during pregnancy. *Cochrane Database Syst Rev*. 2017;(8):CD011653. doi:10.1002/14651858.CD011653.pub2
6. Ellegård, EK. Special considerations in the treatment of pregnancy rhinitis. *Women's Health*. 2005;1(1):105-114.
7. Rabago D, Zgierska A. Saline nasal irrigation for upper respiratory conditions. *Am Fam Physician*. 2009;80(10):1117-1119.
8. Soler, ZM, Nguyen, SA, Salvador, C, et al. A novel device combining acoustic vibration with oscillating expiratory pressure for the treatment of nasal congestion. *Int Forum Allergy Rhinol*. 2020;10: 610–618. doi: 10.1002/alr.22537
9. Ellegård, EK. Clinical and Pathogenetic Characteristics of Pregnancy Rhinitis. *Clinical Reviews in Allergy Immunol*. 2004 26(04):149-9.
10. Franklin, KA, Holmgren, PÅ, Jönsson, F, et al. Snoring, pregnancy-induced hypertension, and growth retardation of the fetus* *Chest*. 2000;117, 137–141.
11. Goanță, CM, Cîrpațiu, D, Tușaliu, M, et al. Pregnancy Rhinitis. *Arch Balk Med Union*. 2018;53(1):114-116.
12. Sladek SM, Magness RR, Conrad KP. Nitric oxide and pregnancy. *Am J Physiol*. 1997;41: R441–R463.
13. Out of the Doldrums Youtube page. Nasal nitric oxide: Can you hum your way to better health? August 9, 2019. Accessed December 7, 2020. <https://www.youtube.com/watch?v=6v-nTRLEXFk>
14. Lawrence G. *Breathing is believing: the importance of nasal breathing* blog. Accessed December 7, 2020.

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