

## Retrospective Study

# Increased Epulis Gravidarum Prevalence in Women with Both Nasal and Oral Symptoms

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## ABSTRACT

### Background

Hormonal variations during pregnancy are frequently linked with functional mucosal alterations both at oral and nasal level. Clinical manifestations of this mucosal involvement can be described generally as pregnancy rhinitis and pregnancy stomatitis and gingivitis. The sexual hormones produced during pregnancy have an important role in the development of rhinitis and gingivitis. Epulis gravidarum affects about 5-10% of pregnant, being defined as a hyperplastic and inflammatory lesion which originates from the buccal mucosa and mainly from gingival tissues.

### Objective

To define whether the coexistence of nasal and oral symptoms should be considered as a major risk factor for the development of epulis gravidarum.

### Materials and Methods

From November 2010 to January 2017, 228 pregnant women were examined during the weeks of gestation, two and four months after partum. They underwent a clinical examination at enrollment (t0), after 2 months (t1), at ninth month of gestation (t2), 2 months after childbirth (t3) and 4 months after childbirth (t4). Were also administered two anamnestic questionnaires concerning the risk factors and nasal and oral symptoms. Patients were divided into 4 groups according to the symptoms of questionnaires: Group A, including women with no nasal and oral risk; Group B, including women with nasal symptoms and no oral involvement; Group C, including pregnant women with oral symptoms and no nasal involvement; and Group D including women with both oral and nasal involvement.

### Results and Conclusion

Our study reveals a statistically significant difference ( $p=0.01$ ) between the frequency of epulis in pregnant women presenting only gingival symptoms (Group C) compared to those which manifest simultaneously nasal and gum symptoms (Group D). In fact, our results seem to suggest that pregnant women who present both nasal and gum symptoms have an increased risk of developing epulis.

### Keywords

Epulis gravidarum; Pregnancy rhinitis; Stomatitis; Gingivitis; Nasal secretion; Nasal blockage; Gum lesion.

## BACKGROUND

Hormonal variations during pregnancy are frequently linked with functional mucosal alterations both at oral and nasal level.<sup>1,2</sup> Although a specific pathophysiological mechanism responsible of this correlation has not yet been defined, an important role is likely played by increasing plasma sex steroid hormone levels during pregnancy, whose effect on periodontium<sup>2</sup> and on nasal mucosa<sup>3-5</sup> is well demonstrated. Recent researches have shown that increasing blood levels of oestrogen and progesterone during pregnancy are responsible for the gingivitis progression.<sup>2,4</sup> Accordingly, rhinitis may be caused by several substances and hormones secreted during pregnancy (porcine growth hormone (PGH), vasoactive intestinal polypeptide (VIP), oestrogen, progesterone), leading to changes in the nasal mucosa.<sup>5</sup> However, in most cases, these alterations are reversible at the end of the pregnancy.<sup>2,5</sup> Clinical manifestations of this mucosal involvement can be described generally as pregnancy rhinitis and pregnancy stomatitis and gingivitis.<sup>2,3,6</sup> Rhinitis, which is most frequently observed, is reported in the 22% of pregnant women.<sup>7,9</sup> Pregnancy rhinitis is defined as a nasal mucosal congestion present for at least six consecutive weeks, without any sign of infection, even in absence of allergy predisposition or endonasal neoformations.<sup>5,7</sup> Symptoms may develop in every stage of pregnancy and completely regresses within two weeks after partum.<sup>8-10</sup> The probability to show pregnancy rhinitis is increased in smokers, with a 69% increase prevalence, in house dust mites sensitized women, and in chronic sinusitis.<sup>7,8,10</sup> Clinically, pregnancy rhinitis is characterized by classic symptoms: serious rhinorrhoea, nasal obstruction, headache, sleep disorders.<sup>10,11</sup> However, etiology is still to be clarified. Numerous substances and hormones secreted during pregnancy lead to changes in the nasal mucosa, increasing the activity of serous-mucous glands and of local vascularization.<sup>5,11,12</sup> Pregnancy gingivitis is defined as a form of periodontal (gum) disease due to the hormonal changes. This leads to increased blood flow to the gum tissue with secondary inflammation of this tissue in response to the presence of plaque.<sup>4,13</sup> During this condition, the gums will appear swollen and easily bleeding.<sup>4,13</sup> In a lower number of cases, gingivitis can be complicated by the development of an epulis.<sup>14</sup> Epulis gravidarum affects about 5-10% of pregnant, being defined as a hyperplastic and inflammatory lesion which originates from the buccal mucosa and mainly from gingival tissues.<sup>15,16</sup> Risk factors are inadequate oral hygiene, chronic gingivitis, use of hormonal therapies, antihypertensive, antiepileptic, immunosuppressive drugs and high gingival levels of active progesterone due to pregnancy.<sup>14</sup> High-levels of progesterone act on the capillary vessels causing endothelial proliferation.<sup>13,14</sup> It is believed that the epulis gravidarum originates from the mesenchyme of the alveolar-dental ligament. The most common histologic type is the "Lobular Capillary Hemangioma (LCH)", also called "pregnancy tumor"; usually it spontaneously regresses after delivery<sup>14</sup> secondary to the inhibition of vascular endothelial growth factor (VEGF) production and cell apoptosis signaling. In our study we have tried to better evaluate the correlation between oral and nasal symptoms during pregnancy, aiming at defining whether the coexistence of nasal and oral symptoms should be considered as a major risk factor for the development of epulis gravidarum.

## MATERIALS AND METHODS

From November 2010 to January 2017, 228 pregnant women in different gestational ages, aged 24 to 40, were evaluated by ears, nose, and throat (ENT) visit and dental examination. Patients were administered two anamnestic questionnaires concerning the risk factors and nasal (Table 1), and oral symptoms (Table 2). Clinical examination, conducted by a specialist Otorhinolaryngologist and by a dentist, was designed to assess the integrity of the nasal and gingival mucosa, congestion of the same, the quantity and quality of nasal secretions, the presence of gum hyperemia in the absence of prosthetic bed sore, gum bleeding, pain and/or tenderness of the gums to acupressure or tenderness to percussion of teeth, development of epulis (Table 3). The clinical examination was performed at enrollment (t0), after 2 months (t1), at ninth month of gestation (t2) (when possible), and 2 and 4 months after childbirth (t3 and t4). Patients were divided into four groups, according to the symptoms questionnaires: Group A, including women with no nasal and oral risk; Group B, including women with nasal symptoms and no oral involvement; Group C, including pregnant women with oral symptoms and no nasal involvement; and Group D including women with both oral and nasal involvement. Statistical analysis was performed with SPSS 10.0 for Windows. Comparison between groups was performed with contingency tables and Fisher's Exact Test. The limit for significance was 0.05.

**Table 1. Nasal Symptoms Questionnaire**

1	Have you ever experienced any of these symptoms?
	- Nasal blockage
	- Nasal secretions
	- Oral respiration
	- Nasal itching
	- Sneezing
	- Itchy palate
2	Have you ever suffered of rhinitis before pregnancy?
3	Did you ever take nasal decongestant drugs?
4	Have you ever been admitted for nasal surgery?
5	Any of your relatives is/has been affected by rhinitis?

**Table 2. Oral Symptoms Questionnaire**

1	Have you ever experienced any of these symptoms or signs?
	- Drooling
	- Gum bleeding
	- Gum lesion
	- Tooth decay
	- Periodontitis
	- Gingival hyperemia
	- Gum tenderness
2	Any of your relatives is/has been affected by epulis?
3	Have you got a mobile or fixed dentures?
4	Have you ever done a dental evaluation?
5	Have you ever taken hormonal therapy?

**Table 3. Symptoms and Signs During the Follow-up**

Symptoms and Signs	t0	t1	t2	t3	t4
State of nasal mucosa					
Quantity and quality of nasal secretions					
Nasal mucosa congestion					
State of gum					
Gum congestion					
Gum hyperemia					
Gum pain					
Pain to percussion of the teeth					
Gum bleeding					
Epulis					

**Table 4. Summary of the Results**

Group	N	Rhinitis	Gingivitis	Risk Factors	Epulis	Symptoms
A	92	0	0	0	0	Asymptomatic
B	42	42	0	0	0	Serous rhinorrhea, headache, mouth breathing
C	64	0	64	26	4	Hypersalivation, gingival hypertrophy and hyperemia, bleeding gums
D	20	20	20	6	6	Gum and nasal symptoms
Total	218					

## RESULTS

Group A, included 92 pregnant women, none of them, according to the questionnaire, reported any risk factors nor developed any symptoms. Group B, included 42 pregnant women without risk factors, all of them reported serious rhinorrhea, headache, nasal blockage, sleep disorders, and the ENT examination showed hyperemia of the nasal mucosa, turbinate hypertrophy with sub stenosis in one or both of the nasal cavity, presence of serious secretions; all symptoms developed around the 4<sup>th</sup>-5<sup>th</sup> month of pregnancy. Group C included 64 pregnant women, 26 of which showed positive risk factors, all of them showed hypersalivation and hypertrophy of the gingival mucosa around 4<sup>th</sup>-5<sup>th</sup> month of pregnancy and, at the follow-up visit, 4 of them had an epulis. Group D, included 20 pregnant women suffering from pregnancy rhinitis and gingival diseases, 6/20 developed an epulis occurring approximately at the same gestational age of Group C (Table 4). After two months postpartum, signs and symptoms of pregnancy rhinitis in women of Group B and D were completely regressed, in one woman of Group C and in two women of Group D, after 4 months postpartum, the surgical excision of the lesion was required. Ten pregnant women left the study. Our findings on the

frequency of the nasal and gum disease during pregnancy are consistent with the scientific literature: the 42.20% of pregnant women were asymptomatic, the frequency of pregnancy rhinitis alone was of 19, 27% (22% reported from the literature).<sup>7,9</sup> As for the epulis, this occurred in 5.5% of our entire sample, in 6.25% of pregnant women who had only the symptoms gum (Group C) compared with 30% of Group D (positive for rhinitis and gingivitis).

## DISCUSSION AND CONCLUSION

Our study reveals a statistic significant difference ( $p=0.01$ ) between the frequency of epulis in pregnant women presenting only gingival symptoms (Group C) compared to those which manifest simultaneously nasal and gum symptoms (Group D). In fact, 4 of 26 pregnant women of Group C presented an epulis; in Group D, a more consistent number of women (6 of 20) developed an epulis.

Although the pathophysiological mechanism is still unclear, the literature suggests the key role of some hormones in the development of gingivitis<sup>4,14</sup> and rhinitis<sup>1-7</sup> during pregnancy. It is well known that increasing blood levels of sex steroid hormone during pregnancy are responsible for mucosal alterations both on periodontium and nasal mucosa.<sup>2,3,5</sup> A study conducted by Wu et al shows the effects of progesterone and estrogen on the change of subgingival microbiota and immunologic physiological mediators in periodontal tissue.<sup>2</sup>

Several studies have shown that the presence of gum diseases is a risk factor for the development of epulis gravidarum.<sup>13-15</sup> A study conducted by Di Placido et al argues that sexual hormones seem to act as growth factors for the subgingival bacterial flora. They can cause modifications in the peripheral vascular system, and a marked increase of vascular permeability and the following edema of the gingival tissues.<sup>17</sup>

The aim of our study was to verify if the concomitant presence of pregnancy rhinitis and gum disorders increases the risk of epulis development during pregnancy. To our knowledge, no other studies were aimed at evaluating such correlation, as most studies are focused on epulis alone or gestational rhinitis alone. Our results seem to suggest that pregnant women who present both nasal and gum symptoms have an increased risk of developing epulis. In our opinion this could be important in order to know and observe the development of epulis in the gravid women, maybe, after further studies, we could consider rhinitis as a predictive prognostic factor for the occurrence of epulis. In fact, these data should, however, be confirmed by further studies involving a greater number of subjects, in order to avoid any possible bias due to local and regional variations.

## FINANCIAL DISCLOSURE

No author has any relevant relationship to disclose

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

## REFERENCES

1. Ellegård EK. The etiology and management of pregnancy rhinitis. *Am J Respir Med.* 2003; 2(6): 469-475. doi: [10.1007/BF03256674](https://doi.org/10.1007/BF03256674)
2. Wu M, Chen SW, Jiang SY. Relationship between gingival inflammation and pregnancy. *Mediators Inflamm.* 2015; 2015: 623427. doi: [10.1155/2015/623427](https://doi.org/10.1155/2015/623427)
3. Ellegård EK. Clinical and pathogenetic characteristics of pregnancy rhinitis. *Clin Rev Allergy Immunol.* 2004; 26(3): 149-159. doi: [10.1385/CRIAI:26:3:149](https://doi.org/10.1385/CRIAI:26:3:149)
4. Preethi R, Ramamurthy J. Pregnancy gingivitis. *Research Journal of Pharmaceutical Biological and Chemical Sciences.* 2015; 6(1): 7-10.
5. Dzieciolowska-Baran E, Teul-Swiniarska I, Gawlikowska-Sroka A, Poziomkowska-Gesicka I, Zietek Z. Rhinitis as a cause of respiratory disorders during pregnancy. *Adv Exp Med Biol.* 2013; 755: 213-220. doi: [10.1007/978-94-007-4546-9\\_27](https://doi.org/10.1007/978-94-007-4546-9_27)
6. Greer IA, Walters B, Nelson-Piercy C. Pulmonary disease in pregnancy. In: *Maternal Medicine: Medical Problems in Pregnancy.* London, England: Churchill Livingstone. 2007. 125-159.
7. Ellegård E, Hellgren M, Torén K, Karlsson G. The incidence of pregnancy rhinitis. *Gynecol Obstet Invest.* 2000; 49(2): 98-101. doi: [10.1159/000010223](https://doi.org/10.1159/000010223)
8. Ellegård EK. Special considerations in the treatment of pregnancy rhinitis. *Womens Health (Lond).* 2005; 1(1): 105-114. doi: [10.2217/17455057.1.1.105](https://doi.org/10.2217/17455057.1.1.105)
9. Ellegård EK. Pregnancy rhinitis. *Immunol Allergy Clin North Am.* 2006; 26(1): 119-135. doi: [10.1016/j.iac.2005.10.007](https://doi.org/10.1016/j.iac.2005.10.007)
10. Hoffmann TK, Wagenmann M, Kojda G, Bender HG, Friebe-Hoffmann U. Symptoms and therapy for pregnancy rhinitis. *Z Geburtshilfe Neonatol.* 2004; 208(4): 126-132. doi: [10.1055/s-2004-827218](https://doi.org/10.1055/s-2004-827218)
11. Schatz M, Zeiger RS. Diagnosis and management of rhinitis during pregnancy. *Allergy Proc.* 1988; 9(5): 545-554.
12. Busse WW, Holgate ST. Asthma and Rhinitis. *Blackwell Science.* 2008; 1811,1813,1824,1825.
13. Tumini V, Di Placido G, D'Archivio D, Del Giglio Matarazzo A. Hyperplastic gingival lesions in pregnancy. Epidemiology, pathology and clinical aspects. *Minerva Stomatol.* 1998; 47(4): 159-167.
14. Rabinerson D, Kaplan B, Dicker D, Dekel A. Epulis during pregnancy. *Harefuah.* 2002; 141(9): 824-826, 856-857.
15. Orosz M, Szende B, Gábris K. The clinical and pathological symptoms of pregnancy epulis. *Fogorv Sz.* 2007; 100(5): 233-241.
16. Moniaci D, Lojaco A, Anglesio G, Vercellino G, Crupi VM, Garavelli M. The clinical and therapeutic aspects of epulis gravidarum. *Minerva Stomatol.* 1990; 39(12): 1023-1026.
17. Di Placido G, Tumini V, D'Archivio D, Di Peppe G. Gingival hyperplasia in pregnancy. II. Etiopathogenetic factors and mechanisms. *Minerva Stomatol.* 1998; 47(5): 223-229.