ENT Changes of Pregnancy and Its Management

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Abstract A unique group of ear, nose, and throat disorders are associated with pregnancy. While most are benign and reverse during the postpartum period, some do not. These disorders may be classified categorically by site into ear, nose, and laryngeal manifestations. The etiology, pathogenesis and management of these disorders are discussed. Therapeutic recommendations are made based on available information. It is especially important to have knowledge of these common manifestations and treat them with precaution considering the possible effects to both the mother and growing foetus during this crucial period.

Keywords Pregnancy · Eustachian tube dysfunction · Otosclerosis · Bell's palsy · Pregnancy rhinitis · Epistaxis · Obstructive sleep apnoea · Laryngopathia gravidarum · Ptyalism gravidarum · Granuloma gravidarum

Introduction

ENT manifestations of pregnancy are myriad. Pregnancy initiates a unique set of physiologic changes in a woman's body. These changes are commonly manifested as complaints concerning the head and neck. From common

findings such as rhinitis and epistaxis, lesions to more rare disorders of the inner ear may be seen; we should be familiar with these conditions for optimal reassurance, expectant management, or treatment of the gravid female. It is especially important to be aware of the possible effects of any medication, on the mother and foetus and to consult the treating obstetrician prior to writing any prescriptions. Most of them are benign and self limited. Being familiar with it and managing it in a safe manner is what is required.

Metabolic and Physiologic Changes During Pregnancy

During pregnancy there is increased Basal Metabolic Rate (BMR) which is due to the increased oxygen consumption, increased cardiac output and expansion of blood volume. There is 4 l increase in the total body water. In the first and second trimester it's mainly the plasma volume and third trimester it's the extravascular fluid volume. This causes boggy mucus membrane and dependent extremity oedema. Postpartum there is a rapid decrease in the plasma volume and slow decrease in the interstitial fluid [1].

Hormonal Changes

Oestrogen and Progesterone peak during the third trimester, this causes changes in the nasal, gingival and laryngeal mucosa. There is steady rise in the serum cortisol as the pregnancy advances, this decreases the inflammatory response resulting in improvement in dermatological and rheumatoid conditions. This rise in serum cortisol also causes relative gestational immunosuppression which leads to reactivation of latent viral infections [1].

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Ear Changes

Hearing impairment and vertigo are the main symptoms seen during pregnancy. Hearing loss is usually due to Eustachian tube dysfunction, otosclerosis and sudden sensorineural hearing loss. Vertigo is attributed to the flaring up of the already existing Meniere's disease.

Eustachian tube dysfunction is seen due to the increasing mucosal oedema which causes obstruction and otitis media with effusion. Symptoms when persistent treatment in the form of systemic decongestants is given. Rarely ventilation tube is required.

Eustachian tube dysfunction may be due to patulous tube during pregnancy when there is inadequate weight gain. They present most often during the 3rd trimester with symptoms of intermittent autophony, and roaring which gets worse with decongestants and upright position. Symptoms improve in supine position and increased humidity. Tympanic membrane examination shows fluttering during respiration, bulge during expiration and retraction during inspiration. Pure tone audiogram is usually normal. Reassurance and steam inhalation is given. It resolves after parturition [2].

Otosclerosis and its relation to pregnancy is due to the effect of oestrogen. Oestrogen stimulates the otosclerotic foci which causes osteocytic activity and ossifies the otospongotic lesions. Most often the symptoms are seen near term or postpartum. If the patient has difficulty in communication hearing aid is given. Postpartum the patient is counseled for stapedectomy. Sodium fluoride which is known to retard bone absorption while accelerating calcification is contraindicated due to adverse foetal effects [3, 4].

Sudden sensorineural hearing loss: Rare but usually associated with toxemia. Oestrogen increases hypercoagulability and vascular occlusion of the inner ear microcirculation. Viral causes also need to be ruled out. Treatment of toxemia is enough and it is not necessary to anticoagulate. Corticosteroids may be given in the third trimester [5].

Meniere's disease may be seen due to fluid retention. Probably oestrogen and progesterone also worsens the symptoms. During an acute attack dimenhydrinate and mclizine can be safely given in pregnancy. Diuretics and histamines are avoided as it causes hypotension, hypovolemia and lowers cardiac output. For intractable vomiting metaclopramide can be used which belongs to category B [6].

Bell's palsy usually presents during the third trimester or early postpartum. The possible etiology is thought to be due to perineural oedema and mechanical compression, viral (Herpes Simplex Virus, HSV) inflammatory reactivation with subsequent demyelination [7]. Corticosteroids is used if it presents in third trimester. Prednisolone is

given 1 mg/kg per day and tapered over 5 days. If HSV is the suspected cause then Acyclovir is used which is a category B drug [8].

Nasal Changes

Most women are affected by *rhinitis* during pregnancy and it disrupts sleep, affects appetite and worsens sinusitis and asthma. Rhinitis in pregnancy is seen due to the oestrogen mediated direct cholinergic effect as it inhibits the acetylcholinesterase, causing vascular engorgement and increased mucous gland activity. These changes in the nose are the worst in the third trimester. Increased plasma volume and third trimester fluid shift to extravascular space causes more nasal discharge and nasal blockage [9].

Treatment of rhinitis essentially consists of improving the nasal blockage and reducing the nasal discharge. Oral decongestants like pseudoephedrine is very helpful in improving both the symptoms. Intranasal topical steroids are helpful but they are category C hence used if symptoms are very worse. Topical decongestant drops and sprays have to be avoided as they become quickly resistant, cause rebound rhinitis and there is a risk of rhinitis medicamentosa.

Patients with chronic sinusitis in whom the diagnosis has to be confirmed and treatment planned need CT scan of the paranasal sinuses. This can be done by shielding the abdomen and pelvis. Once the diagnosis is confirmed then a 14 days course of antibiotics and decongestants should be given. Penicillin, cephalosporins, clindamycin, and erythromycin are safe as these drugs belong to category B [10].

Allergic rhinitis symptoms may begin, worsen or improve. This is seen due to the increased cortisol and gestational immunosuppression [11]. Treatment consists of identifying the allergens and avoiding it. Antihistamines like chlorpheniramine, loratadine, cetirizine (category B) can be used [12].

Epistaxis is seen due to vascular congestion. If the epistaxis is severe then check for haemangioma which appears in early pregnancy and involutes during postpartum. Hypertension and toxemia are other important causes for severe epistaxis. Treatment consists of control of hypertension, saline nasal drops and neosporin ointment for local application. If bleeding does not stop then nasal packing may be required with antibiotic cover [13].

Obstructive sleep apnoea is lower during pregnancy as progesterone is a good ventilatory stimulant. Sleeping on sides helps in relieving the breathing discomfort. If there is progressive hypoxia until arousal this can cause poor foetal growth, foetal arrhythmias, daytime somnolence and personality disorders. The treatment consists of giving CPAP which splints the oropharyngeal airway and removes the obstruction and the apnoea [14].

Gastroesophageal reflux is seen in 50–75% gravid women. The symptom consists of heartburn, sorethroat and hoarseness of voice [15]. These symptoms become worse in the third trimester due to increased abdominal pressure, decreased gastric emptying and decreased lower oesophageal pressure. Treatment consists of small frequent meals, antacids, H₂ blockers like famotidine, ranitidine (category B), or proton pump inhibitors like lansoprazole, pantoprazole, rabeprazole [16, 17].

Granuloma gravidarum (pregnancy tumor) is a pyogenic granuloma which develops on the gingiva during pregnancy. This benign hyperplastic lesion of the oral mucosa occurs in up to 5% of pregnancies. This rapidly growing lesion is typically a painless sessile or pedunculated gum mass, of varied diameter. Spontaneous hemorrhage or bleeding following brushing is observed in some cases. Maxillary tumors are more common than mandibular [18]. Although less common, this lesion may appear on the tongue [19].

Histologically, granuloma gravidarum presents loose granulation tissue rich in capillary vessels and proliferation of endothelial cells, typically accompanied by a mixture of infiltrated inflammatory cells. A thin epithelial layer overlies the lesion and is often ulcerated due to trauma associated with eating or tooth brushing [18]. Management of granuloma gravidarum depends on the severity of the symptoms. If the lesion is small, painless and free of bleeding, clinical observation and follow-up are advised [18]. Steelman and Holmes (1992) reported that maintenance of oral hygiene and regular follow-up appointments while pregnant should be recommended. During pregnancy, surgery is recommended if bleeding or pain from the lesion impedes routine brushing or other daily activities [18], or after delivery if the lesion has not regressed completely [19].

Powell et al. [20] reported the use of Nd:YAG laser for the excision of this tumor in a patient in the 36th week of pregnancy because of the lower risk of bleeding compared to other surgical techniques.

Laryngopathia gravidarum: The human voice is extremely sensitive to the endocrinologic changes of pregnancy. Many of these changes manifest as alterations in fluid content of the lamina propria just beneath the laryngeal mucosa [21]. Collectively, the voice changes of pregnancy are known as laryngopathia gravidarum. Abdominal distension during pregnancy also interferes with abdominal muscle function, altering the mechanics of phonation and creating overuse injuries. Symptoms include hoarseness and voice loss. Singers, in particular, notice a deeper voice and a diminished range of pitch. Treatment is largely supportive, with hydration, and singers should be advised to refrain from singing until abdominal muscle function resolves. Laryngopathia gravidarum typically resolves

postpartum as endocrinologic alterations return to baseline and abdominal support returns [22].

Ptyalism gravidarum is of unknown origin and is usually defined as an excessive secretion of saliva. These patients might have difficulty in swallowing saliva throughout all trimesters of pregnancy [23, 24]. Using gum or ice may be temporary coping strategies; however, the patients always complain of bad taste and maintain that swallowing the excessive or thickened saliva perpetuates the sense of nausea [23]. Ptyalism may diminish during sleep, however the patients may complain of excessive secretions as one cause of nocturnal awakening. In addition, social encounters may be limited during pregnancy [24].

Some researchers consider that ptyalism gravidarum has a physiologic, not psychologic origin. It is generally agreed that salivary secretion is under neural control and that stimulation of the parasympathetic nerve supply of the salivary gland causes a profuse watery secretion with very little organic content [25]. To date, some medical literature has recommended the use of central nervous system depressants such as barbiturates, anticholinergics such as belladonna alkaloid, or phosphorylated carbohydrate [23, 25].

Conclusion

Most of the above mentioned conditions are a direct result of the physiological changes of pregnancy. A sound knowledge of these conditions and their safe treatment would be beneficial both to the mother and foetus.

References

1. Torsiglieri AJ Jr, Tom LW, Keane WM, Atkins JP Jr (1990) Otolaryngologic manifestations of pregnancy. *Otolaryngol Head Neck Surg* 102:293–297
2. Weissman A, Nir D, Shenhav R, Zimmer EZ, Joachims ZH, Danino J (1993) Eustachian tube function during pregnancy. *Clin Otolaryngol Allied Sci* 18(3):212–214
3. Markou K, Goudakos J (2009) An overview of the etiology of otosclerosis. *Eur Arch Otorhinolaryngol* 266(1):25–35 Epub 2008 Aug 13
4. Gristwood RE, Venables WN (1983) Pregnancy and otosclerosis. *Clin Otolaryngol Allied Sci* 8(3):205–210
5. Tsunoda Koichi, Takahashi Shizue, Takanosawa Minako, Shimoji Yoshitaka (1999) The influence of pregnancy on sensation of ear problems—ear problems associated with healthy pregnancy. *J Laryngol Otol* 113:318–320
6. Uchide K, Suzuki N, Takiguchi T, Terada S, Inoue M (1997) The possible effect of pregnancy on Meniere's disease. *ORL J Otorhinolaryngol Relat Spec* 59(5):292–295
7. Vrabec JT, Isaacson B, Van Hook JW (2007) Bell's palsy and pregnancy. *Otolaryngol Head Neck Surg* 137(6):858–861
8. Gillman GS, Schaitkin BM, May M, Klein SR (2002) Bell's palsy in pregnancy: a study of recovery outcomes. *Otolaryngol Head Neck Surg* 126(1):26–30

9. Ellegard EK (2004) Clinical and pathogenetic characteristics of pregnancy rhinitis. *Clin Rev Allergy Immunol* 26(3):149–159
10. Incaudo GA (2004) Diagnosis treatment of allergic rhinitis, sinusitis during pregnancy, lactation. *Clin Rev Allergy Immunol* 27(2):159–177
11. Schatz M, Zeiger R (1998) Allergic disease during pregnancy: current treatment options. *J Respir Dis* 19:834–842
12. Schatz M, Petitti D (1997) Antihistamines and pregnancy. *Ann Allergy Asthma Immunol* 78:157–159
13. Hardy JJ, Connolly CM, Weir CJ (2008) Epistaxis in pregnancy— not to be sniffed at! *Int J Obstet Anesth* 17(1):94–95
14. Sahin FK, Koken G, Cosar E, Saylan F, Fidan F, Yilmazer M, Unlu M (2008) Obstructive sleep apnea in pregnancy and fetal outcome. *Int J Gynaecol Obstet* 100(2):141–146 Epub 2007 Oct 31
15. Gill SK, Maltepe C, Koren G (2009) The effect of heartburn and acid reflux on the severity of nausea and vomiting of pregnancy. *Can J Gastroenterol* 23(4):270–272
16. Aselton P, Jick H, Milunsky A et al (1985) First-trimester drug use and congenital disorders. *Obstet Gynecol* 65:451–455
17. Abrams RS (1990) Will It Hurt the Baby? The Safe Use of Medications during Pregnancy and Breastfeeding. Addison-Wesley, Reading, pp 1–5
18. Sills ES, Zegarelli DJ, Hoschander MM, Strider WE (1996) Clinical diagnosis and management of hormonally responsive oral pregnancy tumor (pyogenic granuloma). *J Reproductive Medicine* 41:467–470
19. Butler EJ, MacIntyre DR (1991) Oral pyogenic granulomas. *Dent Update* 18:194–195
20. Powell JL, Bailey CL, Coopland AT, Otis CN, Frank JL, Meyer I (1994) Nd:YAG laser excision of a giant gingival pyogenic granuloma of pregnancy. *Lasers Surg Med* 14:178–183
21. Brodnitz FS (1971) Hormones and the human voice. *Bull NY Acad Med* 47(2):183–191
22. Sataloff RT, Hoover CA (1997) Endocrine dysfunction. In: Sataloff RT (ed) *Professional voice: the science and art of clinical care*, 2nd edn. Singular, San Diego, pp 293–295
23. Van Dinter MC (1991) Ptyalism in pregnant women. *J Obstet Gynecol Neonatal Nurs* 20:206–209
24. Freeman JJ, Altieri RH, Baptiste HJ, Kao T, Crittenden S, Fogarty K, Moultrie M, Coney E, Kangis K (1994) Evaluation and management of sialorrhea of pregnancy with concomitant hyperemesis. *J Natl Med Assoc* 86:704–708
25. Erick M (1998) Ptyalism gravidarum: an unpleasant reality. *J Am Diet Assoc* 98:129