Otolaryngologic Manifestations of Pregnancy

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A unique group of ear, nose, and throat disorders are associated with pregnancy. While most are benign and reverse after parturition, some do not. These disorders may be classified categorically by site into cutaneous, otologic, rhinologic, oral, pharyngeal, and laryngeal manifestations. The etiology and pathogenesis of these disorders are discussed, making every attempt to separate fact from conjecture. Therapeutic recommendations are made based on available information.

The pregnant woman claims a position unique in the sphere of medicine, both physically and psychologically. The metabolic, endocrinologic, and physiologic alterations occurring during pregnancy affect, to varying degrees, every organ system in every region of the body. The constellation of manifestations is often complex. Signs and symptoms referable to the ear, nose, and throat are not infrequently part of this constellation. As such, obstetricians, gynecologists, family physicians, and otolaryngologists must be familiar with these disorders if they are to diagnose and treat pregnant patients effectively. The facts and myths of ear, nose, and throat disorders occurring during pregnancy are addressed in this paper.

The otolaryngologic manifestations of pregnancy may be arbitrarily divided into (1) otologic disorders, (2) rhinologic disorders, (3) oral manifestations, (4) disorders of the larynx and pharynx, and (5) cutaneous disorders.

OTOLOGIC DISORDERS

PATULOUS EUSTACHIAN TUBE

This poorly explained phenomenon has been observed to occur with increased frequency in the gravid state. It is, of course, well known in patients who have had recent and rapid weight loss and is more prevalent than one would believe from the literature. The onset of symptoms occurs most often during the last trimester and resolves following parturition. The syndrome was first described in 1867 by Jago,[1] who himself suffered from the disorder. Patients most often complain of autophony while speaking and breathing (hearing a hollow-sounding resonance) with symptoms usually limited to the affected side. The audiogram is usually normal, as is the physical examination, although the tympanic membrane has been noted to be thin and bulges with expiration and retracts with inspiration. Tinnitus varies and may be increased by forced respiration. Symptoms may be aggravated by systemic or topical decongestants, which shrink the peritubal mucous membranes and thus increase the patency of the eustachian tube. Symptoms may also be worse in the erect position, improve when supine, and change with alterations in environmental humidity, barometric pressure, and altitude.[2] Symptoms may abate during upper respiratory tract infections secondary to mucosal congestion, whereas exertion, fatigue, and anxiety seem to aggravate them. The use of an auscultation tube in the patient's ear may allow the examiner to appreciate abnormal eustachian tube patency during phonation and respiration. Nasal resonating sounds, n and m, are particularly audible.[3]

Self-insufflation (ie, Valsalva) may increase or paradoxically reduce symptoms. Sudden, rapid, and forceful inspiratory nasal "sniff" may improve symptoms; performing a Müller maneuver (a sharp inspiration through the nose with the mouth closed and nostrils pinched) may be even more effective. Treatment in nonpregnant patients has varied from conservative medical management inclusive of frequent Müller maneuver exercises, increased ambient humidity, and

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nasal douching with numerous solutions or powders (most notably a combination of boric acid and salicylic acid powder in a ratio of 4:1), to surgery including transoral hamulectomy with or without displacement or lysis of the tensor veli palatini muscle tendon, injection or insertion of inert materials (Teflon, Silastic) into the peritubal space, and myringotomy with grommet insertion. Few convincing data exist to support any one form of therapy as most effective. In the pregnant woman, the authors recommend reassuring that the condition is transient, increasing ambient humidity, and performing intermittent Müller maneuvers for symptomatic relief. A myringotomy tube may be inserted under local anesthesia if symptoms are disabling.

OTOSCLEROSIS

Otosclerosis is a term applied to a primary disease of the osseous labyrinth in which there is repeated resorption and redeposition of bone. This process occurs in one or more localized foci, most commonly anterior to the oval window, and may progress to involve the annular ligament and stapes, thus causing bony ankylosis of the stapes and impairment of hearing by air conduction.[4] Involvement of the cochlea may also produce an accompanying sensorineural component to the hearing loss.

While an association between pregnancy and otosclerosis is well recognized, the precise relationship between the two is unclear. It has been suggested that otosclerosis may be activated during pregnancy.[5] Hearing loss, when it occurs, does so most often near term or in the puerperium. Elevated estrogen levels during pregnancy are believed to increase cell membrane fragility, predisposing the patient to the release of enzymes that may activate otosclerotic foci.[6] Walsh[7] believed that stapes ankylosis might be accelerated as the result of pregnancy in as many as 10 percent of patients. Some have suggested, however, that the observed relationship between otosclerosis and pregnancy is merely coincidental, citing the notion that the natural history of otosclerosis is to become clinically evident most frequently during childbearing years.[8] The effect of previous pregnancies, however, does not accurately predict the effect of subsequent ones. Similarly, multiple pregnancies do not appear to increase the risk of hearing loss. Moreover, the effects of abortion on otosclerosis have not been consistent.[9] All in all, it can be said that there is a significant risk of hearing deterioration during any given pregnancy in the woman with clinical otosclerosis.[10]

Stapedectomy, when indicated, is directed at correcting the conductive auditory deficit secondary to fixation of the stapes footplate. This surgery is elective and is often associated with postoperative dizziness; it is not recommended during pregnancy. Hearing amplification is another acceptable mode of treatment. A hearing aid is a particularly appropriate recommendation for the pregnant woman. Medical management using sodium fluoride is occasionally used for otosclerosis associated with significant sensorineural loss. By mouth it results in a positive calcium balance by accelerating calcification of young bone and retarding bone resorption.[11] Its use is controversial in general and certainly contraindicated during pregnancy.

SUDDEN SENSORINEURAL HEARING LOSS

An uncommon accompaniment of pregnancy,[6] sudden sensorineural hearing loss has been associated with toxemia of pregnancy and hypertensive crises.[12] The theory that this disorder is secondary to vascular occlusion in the microcirculation of the cochlea and the eighth cranial nerve from microthrombi or emboli is supported by these latter disorders of pregnancy being associated with an increase in platelet number and adhesiveness and, at times, full-blown disseminated intravascular coagulation.[13] The notion that elevated estrogens during pregnancy predispose women to hypercoagulability is offered to explain the occasional case of sudden sensorineural hearing loss occurring during an uncomplicated pregnancy. Complete neurootologic and audiometric evaluation is essential to rule out other diagnostic possibilities, ie, viral polycranioneuropathy, acoustic tumor, perilymphatic fistulae, and Meniere's disease. Close audiometric follow-up helps to determine prognosis. Patients must be educated concerning preventive care in their remaining good-hearing ear.

Treatment is aimed at the underlying systemic problem, ie, toxemia of pregnancy and hypertensive crises.[12] Attempts to anticoagulate or reduce blood viscosity in the otherwise uncomplicated case, however, are to be discouraged.

FACIAL PARALYSIS

Bell's palsy (idiopathic facial nerve paralysis) has been observed to have a three times higher incidence in pregnant women than in nonpregnant women in the same age group.[14] The majority of cases have occurred during the third trimester. In Edward's large series of pregnant patients with Bell's palsy, the majority developed during the last month of pregnancy, involving the left side most often. One case occurred bilaterally.[14] It has been hypothesized that fluid retention with slowing of peripheral venous blood flow, known to occur in pregnancy, may cause venous congestion within the fallopian canal, thus causing a compressive neuropathy. Compression of the median nerve causing a carpal-tunnel syndrome occurs during pregnancy and has been associated with perineural edema.[15] The possibility of microthrombi or emboli causing vascular occlusion of the vasa nervorum has also been suggested. Bell's palsy occurring during the last trimester of pregnancy is especially significant, as the prognosis for spontaneous recovery is not so good as in nonpregnant women.

Evaluation of facial paralysis in the pregnant woman should be as complete as in the nonpregnant state, recognizing that other causes may be responsible, ie, cerebellopontine angle tumors, inflammatory middle-ear disease, parotid neoplasm, herpetic infection, sarcoidosis, etc. Only after ruling out a myriad of correctable causes can a facial nerve paralysis be diagnosed as idiopathic, or Bell's palsy. Full topognostic and electrical stimulation tests are indicated to establish the degree of neural function, disturbance, and prognosis.

Steroids must be used judiciously and only with the advice and consent of the patient's obstetrician, for the effects of steroids are yet unproven. Steroid use is certainly contraindicated during the early and midtrimesters, and its use in the late third trimester must be tempered with an understanding of the potential fetal side effects. Controversies concerning the surgical management of this disease are similar to those in the nonpregnant state.

MENIERE'S DISEASE

Meniere's disease may also be exacerbated by pregnancy. Meniere's syndrome, or labyrinthine hydrops, must be diagnosed by strict adherence to four criteria: (1) an abrupt onset of paroxysmal whirling vertigo, associated with nausea and vomiting, lasting hours, with complete freedom from vertigo between attacks; (2) a frequently fluctuating and low-frequency hearing loss, often unilateral, accompanying the vertigo; (3) tinnitus accompanying the vertigo that is low pitched and persistent between attacks; (4) an aural fullness. The etiology is uncertain but presumably relates to fluid retention. The predominant pathological feature is dilation of all endolymph-containing structures.

The mainstay of medical treatment includes thiazide diuretics, low-salt diet, and potassium supplementation, although their beneficial effects remain somewhat anecdotal. Depending on the manifestations of the disease, several different surgical procedures have been proposed and tried. As the natural course of the disease is fluctuating, episodic, and somewhat unpredictable, conservative management is the appropriate approach during pregnancy and would include antiemetics and vestibular suppressants.[4] Dimenhydrinate (Dramamine) and meclizine (Antivert) are relatively safe in the minimal doses required for control of vertigo. Diuretics in reduced dosages may be given in the first trimester but should be avoided after that because of possible hyponatremia, hyperbilirubinemia, thrombocytopenia, and hypoperfusion.[16]

It is extremely important to arrange postpartum otolaryngologic follow-up.

VERTIGO

Motion sickness is fairly common during pregnancy and appears to be related to hormonal factors. When estrogen and progesterone levels are highest is when motion sickness appears to be worst.[17] The same rationale and precautions concerning antivertiginous and antiemetic medications for Meniere's disease apply here.

RHINOLOGIC DISORDERS

NASAL STUFFINESS

Nasal congestion is common during pregnancy, occurring most often after the third month. The nose is an organ sensitive to and altered by sex hormone levels.[18] Toppozada et al[19] have studied the ultrastructural and histochemical alterations of the respiratory nasal mucosa during pregnancy. They showed that even symptom-free pregnant women, regardless of duration of pregnancy, show glandular hyperactivity, increased phagocytic activity, and increased mucopolysaccharides in the ground substance of the nasal mucosa. These changes are presumed secondary to the rise in sex hormones. The vasomotor rhinitis of pregnancy is presumably the result of these alterations in addition to increased vascular congestion of the nasal mucosa secondary to the altered hormonal environment.

Pregnancy may initiate or increase nasal allergy,[20,21] and the course of allergic rhinitis is often altered significantly by pregnancy. Indeed, the nasal symptoms of many pregnant women have been proven electron microscopically and histochemically to be allergic in origin. This allergy is not due to hypersensitization of the patient's own sex hormones but may be due to hypersensitivity to placental proteins, fetal proteins, or endogenous haptens. Furthermore, the development of allergic manifestations in some pregnant women might be due to estrogen deficiency, which results in low cortisone blood levels and shorter hydrocortisone half-life than those present in a normal pregnancy.[19]

The physician must differentiate run-of-the-mill upper respiratory tract infections from more serious nasal manifestations of pregnancy. Indiscriminant use of antibiotics is to be discouraged. Supportive measures should be recommended at the first sign of acute coryza to minimize progression of disease.

Although few controlled studies are available to support the use of antihistamine decongestants in pregnancy with regard to fetal teratogenicity, a significant percentage of pregnant women admit to using over-the-counter medication for nasal obstruction with no definite untoward reactions in the fetus. The only in-depth studies of teratogenicity involve the antihistamine doxylamine, which showed no significant increase in frequency of fetal malformations. The American Medical Association states that the adverse effects of antihistamines in pregnancy have not been substantiated but suggests caution in their use. Holt and Mabry[16] feel that "as a practical matter, such risks are small and probably should not be the basis for

withholding needed therapy."

Studies have been done, however, on the effect and absorption of intraturbinal injection of triamcinolone acetonide and beclomethasone aerosol. The studies suggested decreased nasal symptomatology with no significant systemic absorption.[22] Topical cromolyn sodium (Nasalcrom) has become available for the treatment of allergic rhinitis. It prevents histamine release by the mast cells and has proven useful in decreasing allergic symptoms. Animal studies have shown no teratogenicity, and no adverse human fetal effects have been reported.[16]

EPISTAXIS

Fairly common during pregnancy, epistaxis is usually transient and self-limited, but on occasion may be sufficiently profuse to become hemodynamically significant. The cause, diagnosis, and treatment are similar for the pregnant as for the nonpregnant woman.[23] Clearly, the increased vascular congestion and alterations in the nasal mucosa predispose the nose to spontaneous hemorrhage. Several prophylactic measures such as increased ambient humidity, frequent saline nasal douche, and the application of a moisturizing agent to the nares help to prevent hemorrhage. In treating nasal hemorrhage, mention must be made of the theoretical possibility of decreased partial pressure of oxygen in the event that a bilateral anterior or posterior pack is required. Attention to avoiding such hypoxemia in the mother and fetus is essential to prevent complications.

SENSORY ALTERATIONS

Other nasal symptoms that occur with increased frequency during pregnancy include alteration in taste and smell or increased olfactory acuity.[24] The precise reason for these changes remains unclear. Good qualitative and quantitative studies are lacking.

ORAL MANIFESTATIONS

PTYALISM

Increased salivation, or ptyalism, is a frequent complaint of pregnancy. The overflow of saliva about the mouth can cause maceration of lips and skin about the oral cavity.[25] Ptyalism may be due to stimulation of salivary glands by ingestion of starch. Pregnant women commonly experience an increase in appetite, occasionally for nonfood materials, such as laundry starch, clay, or soil. This unusual eating pattern is referred to as pica and may result in severe anemia.[23]

GINGIVAL ALTERATIONS

Gingivitis to varying magnitudes during pregnancy has been described throughout the literature. Ziskin in 1946 classified pregnancy gingivitis into the following five classes and subclasses:[26,27]

Class I. Bleeding gingivae

Class II. Slight change in interdental papillae

Class III. Raspberry-colored free gingival margin; anterior gingiva bleeds easily

Class IVa. Generalized gingival interdental hypertrophy with enlarged and cyanotic papillae

Class IVb. Proliferative tissue originating from the underside of the gingival margin with a definite growth pattern independent of normal gingiva; at times overgrowth covers the crown of the tooth, trapping debris

Class IVc. Growth of papillae that take on the appearance of a pedunculated tumor

Class IVd. Proliferation of tissue from under the papilla covering the tooth without involvement of the papilla

Class IVe. Formation of pseudopapilla

Class V. The pregnancy tumor

The pregnancy tumor is noted at the end of the first trimester and is identical, chemically and histologically, to a pyogenic granuloma.[26] It increases in size after the third month of pregnancy and regresses at parturition.[27]

Ziskin's concept[26,27] suggests that progressive gingival changes ultimately result in the development of one or more pregnancy tumors. This result, however, is not always clinically apparent, as an epulis or pyogenic granuloma can arise as a separate entity without preexisting gingival disease. Gingival alterations of pregnancy appear to be related to the influence of circulating hormones on the mucosa. Increases in progesterone and estrogen cause an increase in blood volume, a decrease in blood viscosity, and an increase in cardiac output. The oral mucosa, being well vascularized, manifests these circulatory changes. Some hypothesize that gingival alterations in pregnancy secondary to these circulatory changes make gingival tissues more susceptible to mechanical irritation. The appearance of these changes is influenced by oral hygiene. Other pathologic conditions, such as periodontitis and dental caries, appear during pregnancy as well, but are unrelated to hormonal changes.

Some form of gingivitis occurs in 75 percent of pregnant women. It is most often painless and most common in the anterior maxillary region. Treatment is generally expectant, with improved oral hygiene being recommended. Rarely may an epulis or pyogenic granuloma become symptomatic or large enough that local excision is required.[28]

DISORDERS OF LARYNX AND PHARYNX

LARYNGEAL DISORDERS

Hoarseness may be noted during pregnancy. A condition known as laryngopathica gravidarum produces temporary changes in the laryngeal mucosa consisting of edema, mucosal drying, and occasionally crusting.[8]

It is believed that generalized fluid retention leads to these laryngeal mucosal abnormalities. It is essential, of course, to rule out other causes, particularly myxedema. Treatment involves reassurance.

REFLUX ESOPHAGITIS

Common in late pregnancy as a result of increased abdominal girth and reduced cardiac sphincter tone, reflux esophagitis, or heartburn, affects roughly one half of pregnant women. Chronic sore throat and hoarseness with arytenoid edema and erythema may be secondary to recurrent exposure of hypopharyngeal and arytenoid mucosa to gastric acid.[20]

CUTANEOUS DISORDERS

Cutaneous alterations are multiple in pregnancy and include changes in hair, pigment, and vascularity. Chloasma, or melasma, occurs in 70 percent of pregnant women and regresses shortly after delivery. The mask-like hyperpigmentation around the eyes is often quite disturbing, but patients must be reassured that it usually disappears completely. Ninety percent of women exhibit hyperpigmentation of preexisting freckles and nevi in addition to the deepened color of nipples and genitalia.[13]

Two thirds of white women and fewer black women develop vascular spiders early in pregnancy that persist until shortly after delivery, when they begin to regress. It is believed that increased circulating estrogen is responsible.[29] Other vascular abnormalities that occur during pregnancy include development of hemangiomas and small glomus tumors, most of which also regress in the puerperium.

Hirsuitism is common during pregnancy and often regresses during the first several months postpartum. Alopecia, which is rare, occurs late in pregnancy and may not be reversible.[27]

SUMMARY

The otolaryngologic manifestations of pregnancy are legion. While most are benign and reverse after parturition, their symptomatology frequently brings women to their physician. It is essential, therefore, that family physicians, obstetricians, and otolaryngologists become knowledgable concerning these disorders so that they may treat the pregnant patient with the same level of supportive expertise in the gravid state as after delivery.

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