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Using corticosteroids to treat sudden sensorineural hearing loss in pregnancy: A case report and literature review

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ABSTRACT

Sudden sensorineural hearing loss (SSNHL) can manifest in pregnancy, but very few cases of SSNHL in pregnancy have been reported and none has been reported in the United States. Additionally, there are no established guidelines for how to treat SSNHL in pregnancy. The purpose of this report is to describe how SSNHL presents in pregnancy, to evaluate other etiologies and discuss current treatment options. A 35-year-old parous woman at 22 weeks of gestation, with a 2-week history of left-sided hearing loss, was shown to have a speech recognition threshold of 70 dB in her left ear. Otolaryngology confirmed the diagnosis of SSNHL. The patient was prescribed an oral prednisone taper that helped alleviate the hearing loss. She had an uncomplicated delivery and treatment with corticosteroids had no adverse consequences for the patient. After ruling out etiologies of SSNHL, corticosteroids may be used safely and efficaciously to treat SSNHL during the second trimester of pregnancy.

1. Introduction

Sudden sensorineural hearing loss (SSNHL) is a rare disease that can occur during pregnancy. Very few cases of SSNHL in pregnancy have been reported and none in the United States. This report is, to our knowledge, the first in the United States to document successful resolution of SSNHL in pregnancy with the use of corticosteroids. Accounts of SSNHL during pregnancy have been reported in Poland, England, Ireland, Portugal, and Taiwan [1–8]. The incidence of SSNHL was reported in Taiwan at 2.71 per 100,000 pregnant women [8]. However, it does not appear that pregnancy is independently a risk factor for the development of SSNHL [7]. Because of the likely demographics of documented cases in the literature thus far, we add that SSNHL does seem possible in pregnant people of Hispanic ethnicity.

Typically, identifiable etiologies are explored and ruled out in a timely fashion prior to initiation of corticosteroid treatment. In this case, timely investigation of anatomic and structural causes of the disease was not feasible. While most cases of SSNHL seem to be idiopathic, identifiable causes include infection, otologic disease, trauma, vascular disease, and neoplastic disease, in decreasing order of frequency [9]. Detailed history and physical examination should be conducted to rule out the possibility of an underlying condition and to guide the diagnostic work-up. It is imperative that identifiable causes of hearing loss be ruled out because treatment of an identified cause may lead to better outcomes for the patient [9]. Patients typically present with tinnitus, vertigo or ear fullness along with unilateral hearing loss. Bilateral symptoms occur in less than 2% [9]. More than 80% of pregnant women with SSNHL experienced symptoms during the second or third trimester [10]. Audiometrics diagnose SSNHL by a sensorineural hearing loss of 30 dB or greater over three continuous frequencies. Although oral corticosteroids are currently the first-line treatment for SSNHL, there still seems to be some debate on optimal treatment of SSNHL, especially during pregnancy [3,6,9,10].

2. Case Presentation

The patient was 35-year-old pregnant Hispanic woman, gravida 3 para 2, with no significant medical or family history, who presented with sudden spontaneous hearing loss beginning in the 22nd week of pregnancy. Upon waking, she noticed mild vertigo and aural fullness. She denied any recent swimming or any associated symptoms of fever, chills, cough, earache or sinus congestion. While the dizziness lasted only one day, the patient later experienced hyperacusis to music and found it difficult to follow a conversation when more than one person was speaking, due to muffled sound and perceived decreased hearing on the left side. She also noticed intermittent tinnitus in the left ear. She subsequently sought evaluation from otolaryngology after symptoms had not resolved for two weeks.

The otolaryngology examination was notable for a Weber test lateralizing to the right with no evidence of trauma, obstruction, or infection and an audiogram and MRI of the head were ordered. Tympanometry was within normal limits bilaterally. The next day, an audiogram showed 70 dB for speech recognition threshold in her left ear compared with 10 dB in the right ear. Normal hearing ranges between −10 and 15 dB. At a louder volume, her ability to discriminate

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speech was 20% in the left ear compared with 100% in the right ear. Complete blood count, comprehensive metabolic panel, and iron studies were all unremarkable. An oral prednisone taper was prescribed 60 mg for 8 days, 40 mg for the next 3 days, and 20 mg for the last 3 days. MRI of brain and internal auditory canals was ordered and recommended but the patient elected to forego the procedure until after pregnancy because she was nervous about the impact on her pregnancy. However, she was receptive to the recommended treatment. Since the patient presented to the otolaryngology office two weeks after onset of symptoms and there is a risk that postponing therapy may lead to worse outcomes in idiopathic SSNHL, it was felt that therapy should not be postponed until after the results of the MRI scan. Nevertheless, the MRI with and without contrast would have ruled out vestibular schwannoma, among other significant structural etiologies.

The patient began taking oral corticosteroids on day 20 of her hearing loss. She noted improvement in hearing from the second day of treatment. On the first day of treatment, the patient reported significant headache and irritability which self-resolved in less than a day. Several months after the resolution of symptoms, our patient was able to have an uncomplicated delivery of her child and a repeat audiogram was conducted. Corticosteroid therapy improved the hearing of our patient, as evidenced by the change in speech recognition threshold from 70 dB to 5 dB. Treatment resulted in mild side-effects early in the therapy, without adverse consequences for mother or child or sequela of hearing deficits after treatment or delivery.

3. Discussion

Identifiable causes of sensorineural hearing loss can include infections, otologic disease, trauma, vascular disease and neoplasms. It is important to utilize history and physical examination to guide the workup because treatment of an identifiable cause varies. Tympanogram tests the compliance of the tympanic membrane which can rule out middle ear effusion and audiometrics can distinguish between sensorineural and conductive hearing loss.

Infectious causes include syphilis, mumps, Lyme disease, herpes simplex and varicella zoster. The most common bacterial causes are Lyme disease and syphilis. Specific antibody titers and markers can also be tested for serology if there is a high index of suspicion for the underlying condition. Infection or reactivation of a virus can cause inflammation and damage to the cochlea and other inner ear structures. Inner ear inflammation can be seen as enhancement of labyrinth and cochlea on MRI [9]. The herpesviridae family has been implicated as causes of SSNHL. Ramsay Hunt syndrome is rare neurological condition caused by reactivation of herpes zoster that presents with unilateral facial paralysis, hearing loss and painful rash. However, viral serologic studies offer little benefit because positive serology does not distinguish between new infection and reactivation of latent virus [11].

Meniere's disease is an otologic disease that presents with hearing loss, tinnitus and vertigo due to excess endolymph in the inner ear [10]. Head injury, rapid compression or decompression can cause tearing of the inner ear membranes [12]. Patients describing the sudden loss of hearing after a “pop” during high-intensity activity suggests trauma resulting in rupture or tearing of Reissner's membrane [9]. The high viscosity of polycythemia vera can cause partial occlusion of small vessels and treatment with plasmapheresis or phlebotomy can reverse the hearing loss [12].

Sensorineural hearing loss is also associated with autoimmune disorders such as systemic lupus erythematous, Wegener's granulomatosis, Sjogren syndrome and Hashimoto's thyroiditis [9]. Antiphospholipid syndrome can form microthrombi in the vasculature of the inner ear. This can be ruled out with testing for anticardiolipin antibodies and lupus anticoagulant because treatment involves long term anticoagulation and it is associated with obstetrical complications such as preeclampsia, fetal loss, and preterm delivery [13]. The last identifiable cause of SSNHL to rule out is neoplastic disease, which accounts for 2% of cases [9]. Vestibular schwannomas, also known as acoustic neuromas, and cerebellopontine angle meningioma can be identified on MRI. SSNHL due to these neoplasms can result in recovery of hearing loss with treatment of steroids even though the mass has not been resected [9].

While resolution of SSNHL in pregnancy has been reported with more conservative measures such as hyperbaric oxygen therapy, corticosteroids were used in this case because it is widely considered to be first-line therapy for idiopathic SSNHL and can be used safely even in pregnancy [3,6,9,10]. Our patient reported only mild side-effects. Corticosteroids have improved hearing loss when started within two weeks of symptom presentation by decreasing inflammation and edema in the inner ear [8]. Recent studies have also shown recovery of hearing loss with using Dextran-40, an intravenous plasma expander, and intratympanic dexamethasone injections [10,14]. Due to the potential side-effects of systemic steroids, targeted intratympanic injections can be a safe route to treat pregnant woman. Further research with randomized, controlled studies comparing the efficacy of these treatments to oral systemic corticosteroids needs to be conducted.

Obstetricians should be aware of this disease entity so that prompt evaluation, management and referral to otolaryngology can occur and maximize outcomes for our patients. The approach should include a thorough history, physical examination and audiometric testing. Given the broad possible etiologies, diagnostic considerations for a patient with sudden sensorineural hearing loss can be extensive. Additional diagnostic tests should be considered for patients based on their risk factors and detailed history for the underlying condition. Corticosteroids can safely be used to treat SSNHL in pregnancy but optimal symptom resolution occurs when started within two weeks.

Contributors

Peter Khamvongsa Contributed to Conceptualization, Review and Editing of the Manuscript

Naiya Patel Contributed to Writing, Review and Editing of the Manuscript

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Octavio Carreno contributed to analysis and interpretation of figures, review and editing of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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