

Sudden Bilateral Sensorineural Hearing Loss Following Postpartum Hemorrhage: A Case Report

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Received: 09 January 2016
Revised: 26 March 2016
Accepted: 24 April 2016

What's Known

- Sudden bilateral sensorineural hearing loss (SNHL) has an occurrence rate <5%, and the etiology of most cases is unknown.
- SNHL can be caused by many conditions and diseases as well as many drugs.

What's New

- Sudden bilateral SNHL due to PPH is a really rare condition.
- To our knowledge, the literature is devoid of similar studies.

Abstract

The prevalence of bilateral sudden sensorineural hearing loss (SSNHL) is less than 5% and the etiology of most cases is unknown. Due to many structural and functional similarities between the kidney and inner ear, many conditions, diseases, and drugs have both renal and cochlear effects and toxicities. There are several reports of SSNHL in patients with CRF, uraemic patient, hemodialysis treatment, and ARF. Here, we report a rare manifestation of SSNHL following severe postpartum hemorrhage that has simultaneous renal failure and cochlear impairment. The patient was a 22-year-old primigravida woman with term pregnancy who after delivery and episiotomy hematoma and postpartum hemorrhage subsequently suffered from kidney failure, oliguria, and SSNHL that occurred after 3 days of delivery. In conditions such as severe postpartum bleeding leading to acute renal involvement, the possibility of simultaneous involvement of cochlea due to hypoxia or received drugs should be considered.

Please cite this article as: Mirzaeian S, Ayati S, Maleki A. Sudden Bilateral Sensorineural Hearing Loss Following Postpartum Hemorrhage: A Case Report. *Iran J Med Sci.* 2017;42(4):404-406.

Keywords • Sensorineural hearing loss • Renal insufficiency
• Postpartum period

Introduction

Sudden sensorineural hearing loss (SSNHL) defined as sudden idiopathic, usually unilateral deafness developed in most within 72 hours in previously healthy person.¹ The most probable causes of idiopathic SSNHL are assumed to be viral cochleitis, microvascular events, and autoimmune disorders.² Because of many structural and functional similarities between the kidney and inner ear, many conditions and disease (e.g. hemodialysis, CRF) and many drugs (e.g. loop diuretics, aminoglycosides) have both renal and cochlear effects and toxicities.³

This article presents a rare manifestation of SSNHL following NVD and postpartum hemorrhage that has simultaneous renal failure and cochlear impairment.

Case Report

A 22-year-old primigravida woman with term normal pregnancy referred to a non-academic hospital due to signs of labor pain with complete dilation and concentrated meconium. Delivery with episiotomy was performed after 10 minutes. The vital signs

before and after delivery were normal. Based on preliminary tests, there were elevated liver enzymes (AST: 174, ALT: 143, LDH: 1474, Bil T: 7.3, and Dbil: 5.5), low platelets (plt: 62000), normal coagulation test (PT=12, PPT=32, INR=1), and negative urine analysis for proteinuria.

Nine hours after delivery, due to clear vaginal bleeding and ecchymosis on the perineum, the patient was transferred to the operating room with a diagnosis of hematoma. The uterine was contracted, cervix was normal, and a hematoma about 10 cm was seen in the vaginal wall. After evacuation and repair of hematoma, she was transferred to ICU for more care. A few hours later, the patient was transferred to the operating room due to continued vaginal bleeding. She was diagnosed and treated for pelvic floor hematoma. The vagina was packed and a drain was inserted at the hematoma site. She received 4 units of packed cell and 4 units of FFP. After 24 hours, due to active re-bleeding (about 1200 cc at the drain location within 2 hours), the patient again underwent surgery to suture and tampon of perineum. Due to severe bleeding and coagulation abnormalities (pt: 16, INR: 1.9, PTT: 32), she received 2 units of whole blood, 6 units of FFP, 18 units of platelets, 8 units of CRYO, and 3 units of PC. The patient underwent treatment with broad-spectrum antibiotics, including cefepime, metronidazole, and azithromycin.

On the third day of hospitalization, the patient was complicated by oliguria and increased creatinine. She was diagnosed as having ATN and treated with Lasix 40 mg bid and 3U of FFP every 12 hours. Due to continued oliguria and finally being anuric, emergency dialysis was performed on the fifth day. On the sixth day of admission, creatinine was declining and diuresis was established. Coagulation abnormalities were modified and diuretics were stopped.

The patient had complaints of bilateral hearing loss associated with non-continuous and non-pulsatile tinnitus and dizziness on the fourth day of admission. It quickly progressed to a full bilateral sensorineural hearing loss on the sixth day of admission. She had no history of hearing disorder before admission. Otoscopy examination was normal in both ears. According to an audiometry test, Weber test was midline and Rinne test of both sides was negative. All neurological examination and brain CT-scan were normal.

Based on SSNHL diagnosis, prednisone was administered. On the twentieth day of admission, except for her hearing loss, all other clinical and laboratory signs were normal. Finally, on

the twenty-fifth day, the patient was discharged with bilateral sensorineural hearing loss and diagnosis of cochlear damage. After 2 years, her condition is unchanged and she is a candidate for cochlear transplantation.

Informed written consent was obtained from the patient for reporting the case.

Discussion

SSNHL is a sudden and unexplained hearing loss for at least 30 dB, which is repeated during 3 consecutive hearing test, occurs in less than 72 hours, and is idiopathic in most cases. Prognosis depends on the severity of hearing loss.² Most cases of sensorineural hearing loss are unilateral and the incidence of bilateral is less than 5%.²

The etiology of most sudden SSNHL cases is unknown. The most probable causes of idiopathic SSNHL are viral cochleitis, microvascular events, and autoimmune disorders. Other factors involved in SSNHL include coagulation disorders, neoplasms, and demyelinating diseases.² The relationship with gene-related prothrombotic situations (especially MTHFR polymorphism) and the elevation of serum fibrinogen and homocysteine in SSNHL patients suggests a multifactorial background for microvascular events as the cause of SSNHL.²

Several risk factors, including furosemide consumption,¹ renal insufficiency,² uremia,³ bleeding and hypotension,⁴ and preeclampsia⁵ can be the cause of SSNHL. A possible cause is the use of high-dose furosemide because of anuria associated with simultaneous kidney failure. Diuretics loop can cause autotoxicity, which can lead to deafness.² This damage can be permanent in high-dose intravenous administration. The damage can occur in cases of low-dose administration for simultaneous kidney failure. Many cases of permanent deafness associated with the administration of furosemide have been reported based on the evidence that furosemide can cause stria damage.⁶

The cochlea and kidney have similar physiological mechanisms, including the active transport of fluid and electrolytes through stria vascularis and glomerulus.³ There are several factors as the possible causes of hearing loss in kidney failure, including the use of ototoxic drugs, electrolyte imbalance, hypertension,^{6,7} and hemodialysis treatment.⁷

The patient in this case report had a course of severe uremia (UREA: 149, CR: 5.2) over several days. Although many reported cases of SSNHL were associated with CRF and hemodialysis,³ but some cases of hearing loss

have been reported in patients with uremia and acute renal failure.⁸

Severe hemorrhage and hypotension following hematoma and recurrent postpartum hemorrhage can be one of the causes of SSNHL. Systemic hypotension that results in cochlear hypoxia following vasoconstriction must be considered as the possible cause for the development of SSNHL in young healthy patients.^{9,10} Although preeclampsia has been suggested as a risk factor for SSNHL,⁵ it cannot be considered as a significant factor in our patient since her blood pressure before, during, and after delivery were normal as well as the lack of proteinuria. Furthermore, SSNHL occurred 4 days after delivery and thus changes caused by the delivery cannot be the cause in our patient. Hence, it seems that the main factors of SSNHL are diuretics loop administration due to the oliguria, simultaneous kidney failure, and uremia.

Conclusion

We could not identify an obvious cause for the sudden sensorineural hearing loss in our patient. We strongly recommend further research and investigation on this topic.

Conflict of Interest: None declared.

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