

## Influenza A (H1N1): a rare cause of deafness in two children

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### Abstract

**Objective:** We report deafness occurring as an extremely rare complication of influenza A caused by the H1N1 virus ('swine flu'), in two children.

**Methods:** Case reports and review of the literature concerning influenza A (H1N1) and acquired viral infection causing deafness.

**Results:** Two children with normal hearing developed bilateral deafness following influenza A (H1N1). The diagnosis was confirmed using polymerase chain reaction. Both patients were treated with oseltamivir.

**Conclusion:** Following a review of the literature, these two patients appear to be the first reported cases of bilateral deafness following influenza A (H1N1).

**Key words:** Ear, Inner; Hearing Loss, Sensorineural; Influenza A Virus, H1N1 Subtype; Child

### Introduction

Swine-origin influenza A ('swine flu') has become the first pandemic of the twenty-first century.<sup>1</sup> In April 2009, a novel strain of human influenza A, identified as H1N1 virus, began to spread rapidly throughout the world. In early June 2009, the World Health Organization raised the pandemic alert level to phase six.<sup>2</sup>

Viral infections are well known and documented causes of deafness in children. The symptoms of influenza A (H1N1) are similar to the symptoms of regular human seasonal influenza and include fever, cough, sore throat and myalgia; deafness is not a well documented clinical manifestation.

The below-described two patients are believed to be the first reported cases of bilateral profound deafness following influenza A (H1N1).

### Case reports

#### Case one

A two-year-old girl presented to our clinic with a history of deafness which was noted by her family to have begun two months previously, after she had suffered bronchopneumonia caused by influenza A (H1N1), confirmed by polymerase chain reaction. The patient's bronchopneumonia had been treated with oseltamivir. Prior to this illness, her hearing had been normal and her speech development had been appropriate for her age. There was no other significant past medical history or family history.

The clinical examination was normal.

Audiological assessment indicated bilateral, severe, sensorineural hearing loss (SNHL) (Figure 1). Speech assessment indicated that the patient's speech was starting to deteriorate. Computed tomography and magnetic resonance

imaging (MRI) scans of the brain and temporal bones were normal.

The girl was fitted with hearing aids for three months. There was some stabilisation of her speech development.

#### Case two

A three-month-old male infant was brought in by his family because he had stopped responding to sound. This had begun after the child had suffered a high fever and had been admitted to hospital for investigation. During this admission, polymerase chain reaction testing had confirmed the presence of influenza A (H1N1) virus, and the patient had been treated with oseltamivir. There was no significant past medical history or family history. The infant had passed the neonatal hearing screening programme in the hospital where he had been born.

Clinical examination was normal.

Congenital infection screening tests and thyroid function tests were both normal. Audiological assessment showed bilateral profound SNHL. Computed tomography and MRI of the temporal bone and brain were within normal limits.

The baby was fitted with hearing aids and given a follow-up appointment with the audiology unit to monitor progress.

### Discussion

A number of viruses have been implicated as aetiological agents for congenital and acquired hearing loss. Acute SNHL can occur as a complication of viral illness such as mumps and herpes zoster or herpes simplex virus infection.<sup>3</sup> One study of idiopathic sudden hearing loss found multiple viral agents: influenza virus group B was found in 14 patients (18 per cent), rubeola in 12 (16 per cent), herpes simplex type 1 in 6 (8 per cent), mumps virus in 6 (8 per cent), influenza

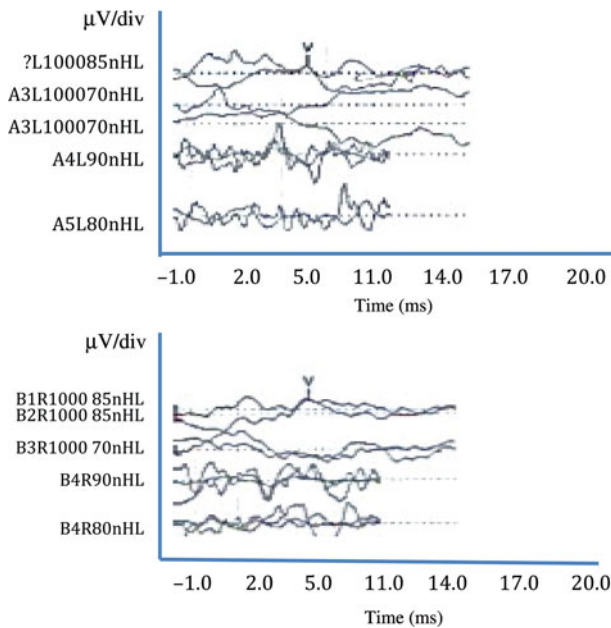


FIG. 1

Auditory brain stem responses of both ears in case one, showing a V wave detectable at a threshold of 85 dB in both ears.

group A3 in 6 (8 per cent), rubella virus in 5 (7 per cent) and cytomegalovirus in 5 (7 per cent).<sup>4</sup>

- Deafness is an extremely rare complication of influenza A (H1N1) ('swine flu')
- In the two reported cases, such deafness was severe and permanent
- No specific radiological features of the temporal bone were seen in these cases

There have been very few published studies of influenza A (H1N1) virus and its clinical manifestations in the paediatric setting.<sup>5–8</sup> The clinical manifestations of influenza A (H1N1) virus infection are similar to those of seasonal influenza. There has been only one previously reported case of deafness associated with H1N1 virus infection, in an adult who developed sudden, unilateral deafness and who recovered completely.<sup>9</sup> However, the two patients reported in the

current paper both developed bilateral, severe to profound, non-reversible deafness following H1N1 virus infection. Following a review of the literature, these two patients appear to represent the first reported cases of bilateral, profound deafness secondary to H1N1 virus infection. This unfortunate outcome developed subsequent to, and was probably related to, the viral infection.

#### References

- 1 Chang LY, Shih SR, Shao PL, Huang DT, Huang LM. Novel swine-origin influenza virus A (H1N1): the first pandemic of the 21st century. *J Formos Med Assoc* 2009;**108**:526–32
- 2 Jain R, Goldman RD. Novel influenza A(H1N1): clinical presentation, diagnosis, and management. *Pediatr Emerg Care* 2009;**25**: 791–6
- 3 Chand RP, Jan A, Vyas H. Acute sensorineural deafness following herpes simplex infection. *Eur J Pediatr* 1993;**152**:379
- 4 Veltri RW, Wilson WR, Sprinkle PM, Rodman SM, Kavesh DA. The implication of viruses in idiopathic sudden hearing loss: primary infection or reactivation of latent viruses? *Otolaryngol Head Neck Surg* 1981;**89**:137–41
- 5 Hackett S, Hill L, Patel J, Ratnaraja N, Ifeyinwa A, Farooqi M *et al*. Clinical characteristics of paediatric H1N1 admissions in Birmingham, UK. *Lancet* 2009;**374**:605
- 6 Koliou M, Soteriades ES, Toumazi MM, Demosthenous A, Hadjidementriou A. Epidemiological and clinical characteristics of influenza A(H1N1)v infection in children: The first 45 cases in Cyprus, June - August 2009. *Euro Surveill* 2009;**14**:pii, 19312
- 7 Libster R, Bugna J, Coviello S, Hijano DR, Dunaiewsky M, Reynoso N *et al*. Pediatric hospitalizations associated with 2009 pandemic influenza A (H1N1) in Argentina. *N Engl J Med* 2010;**362**:45–55
- 8 O'Riordan S, Barton M, Yau Y, Read SE, Allen U, Tran D. Risk factors and outcomes among children admitted to hospital with pandemic H1N1 influenza. *CMAJ* 2010;**182**:39–44
- 9 Blum A, Simsolo C. Acute unilateral sensorineural hearing loss due to H1N1 infection. *Isr Med Assoc J* 2010;**12**:450

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