The Journal of Laryngology and Otology
September 1997, Vol. **111**, pp. 855–857

'Farmer's ear': sudden sensorineural hearing loss due to *Chlamydia psittaci* infection

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Abstract
A case of sudden sensorineural hearing loss in association with a *Chlamydia psittaci* pneumonia is reported. Rapid recovery was seen when the patient was treated with high dose steroids and appropriate antibiotics. This is the first such case report in the literature.

Key words: Hearing loss, sensorineural; *Chlamydia psittaci*; Pneumonia

Introduction

Sudden sensorineural hearing loss is a relatively uncommon condition with a huge list of potential causes including infections. The commonest infective agents to be implicated are viruses such as mumps, measles, varicella zoster, influenza and Epstein-Barr viruses and bacteria such as mycoplasma, syphilis and typhoid (Booth, 1987).

Chlamydiaceae are a group of agents with mixed allegiance: they are obligate intracellular pathogens like viruses but contain both DNA and RNA like bacteria. The genus *Chlamydia* contains three species: *Chlamydia trachomatis*, *Chlamydia psittaci* and *Chlamydia pneumoniae*, all of which can cause disease in humans. *Chlamydia psittaci* has an avian reservoir and cases of pneumonia following exposure to infected birds are well recognized. However, infection with *Chlamydia psittaci* can result in many other clinical presentations and its implication in an illness may be overlooked (Puolakkainen *et al.*, 1987).

Chlamydia psittaci infection has been reported in association with a case of Cogan's syndrome, a syndrome characterized by fluctuating sensorineural hearing loss, vertigo, uveitis and keratitis (Darougar *et al.*, 1978). A case of sudden profound bilateral sensorineural hearing loss with evidence of *Chlamydia psittaci* infection but without evidence of ophthalmic or vestibular involvement is presented.

Case history

A 61-year-old pig farmer presented with a history of sudden onset bilateral hearing loss and high pitched tinnitus. There was no history of vertigo, otalgia, discharge or trauma. Further questioning revealed a prodromal illness characterized by fever, severe headache, scalp tenderness and diarrhoea during the preceding fortnight. There was no past medical history, family history or drug history of note.

Examination revealed normal tympanic membranes, a temperature of 38.2 °C and crepitations in the right lower zone. Tuning fork hearing tests suggested a sensorineural hearing loss. Examination was otherwise unremarkable.

Pure tone audiometry showed a bilateral sensorineural hearing loss of 50–85 dB (Figure 1). Tympanometry confirmed normal middle ear function. Chest X-ray showed perihilar consolidation in the right lung (Figure 2).

A battery of blood tests was requested and the positive results are presented in Table I. The raised white cell count was characterized by a neutrophilia with a relative lymphopenia. Apart from the rheumatoid factor, screening for other autoantibodies was negative, immunoglobulin levels were normal and an extensive search failed to reveal infection with other bacterial or viral agents. The positive *Chlamydia psittaci* serology was confirmed by the national reference laboratory and was considered to be diagnostic of an acute chlamydial infection.

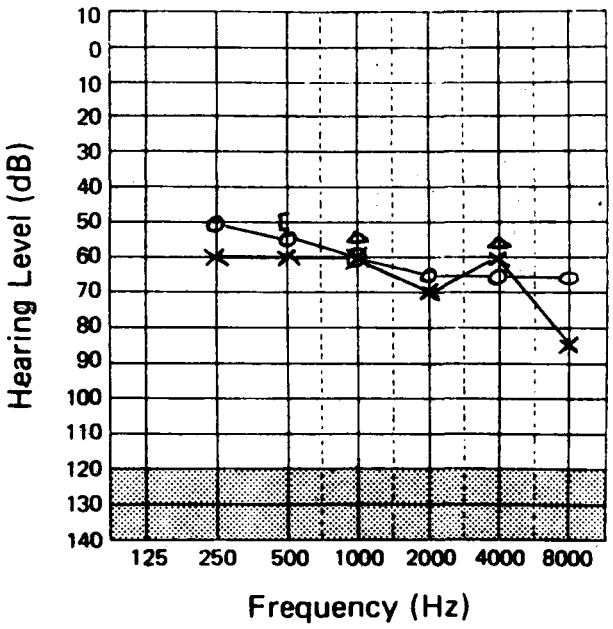

FIG. 1
Pure tone audiogram before treatment.

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Accepted for publication: 4 July 1997.

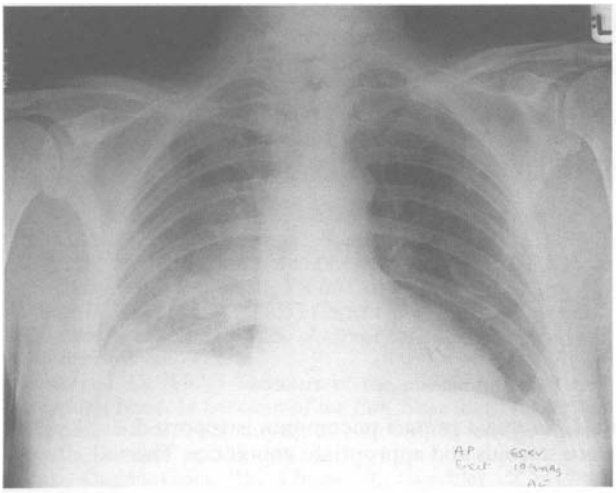

FIG. 2
Chest X-ray showing atypical pneumonia with right sided perihilar consolidation

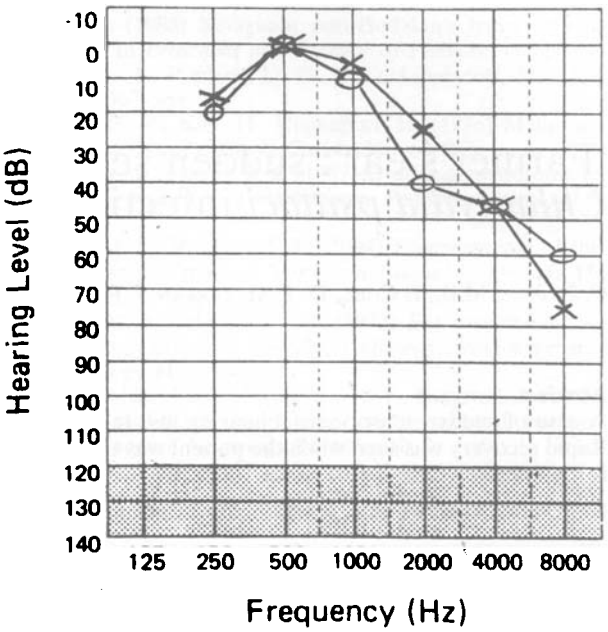

FIG. 3
Pure tone audiogram after treatment.

Treatment on admission comprised bed rest and treatment for sudden sensorineural hearing loss with betahistine, carbogen and prednisolone (initial dose 60 mg/day). Treatment for an atypical pneumonia, with amoxycillin and erythromycin, was instituted once samples for microbiological tests had been taken.

A rapid recovery was observed. The hearing loss and tinnitus began to recover within 12 hours, after the steroid therapy had been commenced but before the patient had received antibiotics. Over the next month a full recovery of all the symptoms, signs and abnormal investigations was observed. One month after presentation the hearing had subjectively recovered to normal and an audiogram showed a mild high frequency sensorineural hearing loss commensurate with the patient's age (Figure 3). A reducing course of prednisolone was continued over a 10-week period. The patient has been followed up for one year and there has been no subsequent recurrence of any of the symptoms.

Discussion

Sudden sensorineural hearing loss has been defined as a decrease in hearing that occurs instantly or over a period of several hours to days (Byl, 1984). Many causes of sudden sensorineural hearing loss are described, including vascular, infectious, neoplastic, traumatic, autoimmune, metabolic, endocrine and drug-induced causes (Shaia and Sheehy, 1976). A large proportion are idiopathic: theories of the aetiology of idiopathic cases include viral infection and vascular insufficiency in the inner ear (Anderson and Meyerhoff, 1983). Medical therapy includes treatment of underlying conditions, measures intended to decrease inner ear inflammation and regimens to increase inner ear blood flow and oxygenation. Medical treatments used have included corticosteroids, vasodilators, anticoagulants, plasma expanders and diuretics, used alone or in combination (Byl, 1984). It is believed that early treatment of sudden sensorineural hearing loss improves the prognosis (Morrison and Booth, 1970).

TABLE I
HAEMATOLOGICAL TESTS WHICH YIELDED POSITIVE RESULTS

Investigation	Result	Normal range
White blood count	15.5	4.0–11.0
ESR	74	1–10
CRP	141	0–30
ALP	933	38–126
ALT	421	0–50
AST	259	0–40
GGT	303	0–60
Rheumatoid factor	positive	
Chlamydia psittaci titre	512	

A diagnosis of *Chlamydia psittaci* pneumonia in this case was made on the basis of a compatible illness and a *Chlamydia psittaci* titre of 512. There was no history of exposure to psittacine birds such as parrots but this is not unusual in cases of *Chlamydia psittaci* infection. However, the patient did give a history of exposure to ducks and pheasants, both of which are recognized sources of *Chlamydia psittaci* (Bracewell and Bevan, 1986).

The extrapulmonary features of atypical pneumonias are often prominent (Johnson and Cunha, 1993). Most of the extrapulmonary features of this case, including fever, headache, diarrhoea, raised white cell count, abnormal liver enzymes and elevated ESR and CRP have been described previously in patients with *Chlamydia psittaci* pneumonia (Puolakkainen *et al.*, 1987; Yung and Grayson, 1988; Crosse, 1990).

Sudden sensorineural hearing loss, however, has not been described, previously, as an extrapulmonary feature of *Chlamydia psittaci* pneumonia. There are three reported cases of hearing loss associated with *Chlamydia psittaci* infection: the first two cases (Puolakkainen *et al.*, 1987; Crosse, 1990) are mentioned without reference to the type of hearing loss or the speed of onset of the condition and therefore cannot be regarded as proven cases of sudden sensorineural hearing loss. The third patient had Cogan's syndrome characterized by bilateral uveitis and keratitis with aural symptoms resembling Menière's disease: she suffered sensorineural hearing loss, with tinnitus, and vertigo, that followed a chronic relapsing course. There were raised chlamydial antibody titres and *Chlamydia psittaci* was isolated from the conjunctiva. It was postulated that *Chlamydia psittaci* was responsible for all the described lesions including the sensorineural hearing loss (Darougar *et al.*, 1978). Pneumonia was not a feature of

https://doi.org/10.1017/S0022215100138800 Published online by Cambridge University Press

this illness. Cogan's syndrome is a vasculitic condition and it is possible that the aural symptoms of this case were mediated by a vasculitic process.

A vasculitic basis could be suggested for the current case report. Evidence in favour of this includes the severe headache and scalp tenderness, raised ESR and CRP, and rapid response to steroids. Vasculitides have been reported in association with infection by a wide variety of agents including *Chlamydia psittaci* (Somer and Finegold, 1995). Also of interest are the cases of sudden sensorineural hearing loss reported in association with *Mycoplasma pneumoniae* chest infections (Nishioka *et al.*, 1987). Suggested mechanisms of sudden sensorineural hearing loss in these cases include central nervous system invasion, toxin production or stimulation of an immunological response by the organism (Hodges *et al.*, 1972). Rheumatoid factor was positive in the current case and might suggest an immunological process was operating. However, the rheumatoid factor is notoriously non-specific and positive results have been reported with many infective processes (Thomas *et al.*, 1995) as well as occurring in vasculitides and even among the normal healthy population.

Although the exact mechanism remains a matter of conjecture, this case report describing a patient with sudden bilateral sensorineural hearing loss as a presenting feature of a *Chlamydia psittaci* pneumonia does illustrate the importance of the extrapulmonary features of atypical pneumonias.

Acknowledgements

The authors would like to thank Mr M. Wickstead for allowing them to report his patient.

References

Anderson, R. G., Meyerhoff, W. L. (1983) Sudden sensorineural hearing loss. *Otolaryngologic Clinics of North America* **16:** 189–195.

Booth, J. B. (1987) Sudden and fluctuant sensorineural hearing loss. In *Scott-Brown's Otolaryngology.* 5th Edition. (Kerr, A. G., ed.), Butler and Tanner, Frome, Somerset, pp 387–434.

Bracewell, C. D., Bevan, B. J. (1986) Chlamydiosis in birds in Great Britain. *Journal of Hygiene* **96:** 447-451, 453–458.

Byl, F. M. (1984) Sudden hearing loss: Eight years experience and suggested prognostic table. *Laryngoscope* **94:** 647–661.

Crosse, B. A. (1990) Psittacosis: a clinical review. *Journal of Infection* **21:** 251–259.

Darougar, S., John, A. C., Viswalingam, M., Cornell, L., Jones, B. R. (1978) Isolation of *Chlamydia psittaci* from a patient with interstitial keratitis and uveitis associated with otological and cardiovascular lesions. *British Journal of Ophthalmology* **62:** 709–714.

Hodges, G. R., Fass, R. J., Saslaw, S. (1972) Central nervous system disease associated with *Mycoplasma pneumoniae* infection. *Archives of Internal Medicine* **130:** 277–282.

Johnson, D. H., Cunha, B. A. (1993) Atypical pneumonias. Clinical and extrapulmonary features of *Chlamydia*, *Mycoplasma* and *Legionella* infections. *Postgraduate Medicine* **93:** 69–82.

Morrison, A. W., Booth, J. B. (1970) Sudden deafness: an otological emergency. *British Journal of Hospital Medicine* **4:** 287–298.

Nishioka, K., Masuda, Y., Okada, S., Takata, N., Tasaka, S., Ogura, Y. (1987) Bilateral sensorineural hearing loss associated with *Mycoplasma pneumoniae* infection. *Laryngoscope* **97:** 1203–1206.

Puolakkainen, M., Kousa, M., Saikku, P. (1987) Clinical conditions associated with positive complement fixation serology for *Chlamydiae. Epidemiology and Infection* **98:** 101–108.

Shaia, F. T., Sheehy, J. L. (1976) Sudden sensorineural hearing impairment: a report of 1220 cases. *Laryngoscope* **86:** 389–398.

Somer, T., Finegold, S. M. (1995) Vasculitides associated with infections, immunization and antimicrobial drugs. *Clinical Infectious Diseases* **20:** 1010–1036.

Thomas, M. J., Adebajo, A., Chapel, H. M., Webley, M. (1995) The use of rheumatoid factors in clinical practice. *Postgraduate Medical Journal* **71:** 674–677.

Yung, A. P., Grayson, M. (1988) Psittacosis – a review of 135 cases. *Medical Journal of Australia* **148:** 228–233.

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