Short reports

Pneumonitis secondary to the influenza vaccine

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Summary

We report a 58-year-old man who developed respiratory distress and interstitial shadowing on chest X-ray 10 days after receiving the influenza vaccine. He failed to respond to intravenous antibiotics but his clinical condition, hypoxia and chest X-ray changes improved dramatically on oral steroids. The clinical diagnosis was pneumonitis secondary to recent influenza vaccination.

Keywords: influenza vaccine; pneumonitis; adverse drug reaction

It has been proposed by the NHS Centre for Reviews and Dissemination that annual influenza vaccination should be carried out for everyone over 65 years.¹ However, the Department of Health only recommends vaccination of individuals at high medical risk or those who are institutionalised.² The recommended widespread vaccination of elderly subjects may lead to increased reporting of minor reactions. Although serious adverse reactions are rare, we report severe pneumonitis in a 58-year-old man occurring 10 days following influenza vaccination.

Case report

A 58-year-old man presented with a history of 27 idiopathic pneumothoraces 24 years previously for which a right lobectomy was performed. Further history included arthritis, myocardial infarction and nephrolithiasis. Otherwise he had previously been well until he presented with a one-week history of weight loss, night sweats and shortness of breath. Ten days prior to admission he had received the influenza vaccine. On admission he was pyrexial (38.5°C), centrally cyanosed, dyspnoeic and there was good air entry throughout the chest with no crepitations or rhonchi. A right thoracotomy scar was present.

At the time of admission, investigations indicated a normal haemoglobin (haemoglobin 13.6 g/dl), white cell count ($5.4 \times 10^9/l$) and differential white cell count. Urea and electrolytes were normal with the exception of a raised urea (7.5 mmol/l). Liver function tests were normal with the exception of low albumin (29 g/l) and total protein (55 g/l). C-Reactive protein was raised at 48.3 mg/l with a normal erythrocyte sedimentation rate (18 mm/h). Two sets of blood cultures were sterile. Arterial blood gases revealed hypoxia (pO_2 9.0 kPa), normal pCO_2 (5.28 kPa) and pH (7.43).

Figure 1 Chest X-ray on admission showing increased interstitial shadowing radiating from the left hilum

Angiotensin-converting enzyme and thyroid function tests were normal. Rheumatoid arthritis latex and rheumatoid arthritis particle agglutination were negative. Autoantibodies, vasculitis profile and immunoglobulins were within normal limits. Chest X-ray indicated interstitial shadowing radiating from the left hilum (figure 1). Electrocardiogram showed normal sinus rhythm. Sputum and urine were both negative for organisms and tuberculosis on microscopy and culture. Pulmonary function tests were as follows: $FEV_1 = 2.79$ l (87% predicted); $FVC = 3.21$ l (80% predicted); $FEV_1/FVC = 87\%$; $PEF = 352$ l/min (71% predicted). No transfer factor was performed.

He was empirically commenced on intravenous cefotaxime but remained pyrexial and failed to make satisfactory progress. A ventilation-perfusion scan showed no evidence of pulmonary embolism. Four days following admission there was evidence of increasing hypoxia (pO_2 7.7 kPa) despite 100% oxygen and the chest X-ray appearances had worsened (figure 2). He was then commenced on oral prednisolone 60 mg daily and there was a rapid resolution of his dyspnoea, pyrexia, cyanosis, hypoxia (pO_2 13.8 kPa on room air within 4 days) and chest X-ray appearances (figure 3). At 2-week follow-up he was significantly better and his chest X-ray appearances had cleared completely. C-Reactive protein had normalised (< 1.0 mg/l). Following discharge, anti-pigeon antibodies by enzyme-immunoassay were positive (IgG 0.707; normal range 0.0-0.2) although there was no history of avian exposure.

Discussion

Influenza vaccine is known to be effective in preventing infection in high-risk populations,

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Figure 2 Chest X-ray 4 days after admission showing a deterioration in these appearances with bilateral interstitial shadowing

Figure 3 Improvement in chest X-ray appearances after oral steroids for 6 days

including the elderly.³ Adverse events related to this and other vaccines are usually mild and do not warrant specific treatment. Pneumonitis is a recognised complication of other vaccines and has previously been reported after measles/mumps/rubella vaccination in an HIV patient.⁴ Pneumonitis has also been described after bladder instillation with Bacillus-Calmette-

Summary points

- influenza vaccination is effective in preventing infection in at risk groups
- adverse effects from vaccines are usually mild
- there are no previous reports in the medical literature of pneumonitis complicating influenza vaccination
- in this case pneumonitis led to acute respiratory distress which responded dramatically to oral steroids

Guerin (BCG) used for immunotherapy in bladder carcinoma⁵ and this has been successfully treated with oral steroids.⁶ The Committee on Safety of Medicines (CSM) Adverse Drug Reactions Online Information Tracking (ADROIT) database records two cases of pneumonitis secondary to influenza vaccination but there are no reports in the medical literature. One of these cases presented with prolonged pyrexia and bilateral lung shadows which responded to oral prednisolone.

This case is an example of an adverse event related to influenza vaccination which responded dramatically to the administration of oral steroids. The CSM was notified of this case via the Yellow Card system. Pneumonitis in this case is thought to occur on the basis of a type III hypersensitivity reaction which is associated with immune complex deposition in the lungs. The antigen is most likely to be the pneumococcal polysaccharide capsule which constitutes the vaccine, although the inert carrier for this vaccine may also be involved. The anti-pigeon antibodies are not thought to be significant in this instance. Although it is clear that vaccinating all elderly people against influenza prevents illness and saves lives, the possibility that adverse reactions may occur should always be considered.

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4 Measles pneumonitis following measles-mumps-rubella vaccination of a patient with HIV infection. *MMWR* 1996; 45:603-6.

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6 Molina JM, Rabian C, D'Agay MF, Modai J. Hypersensitivity systemic reaction following intravesical bacillus-Calmette-Guerin: successful treatment with steroids. *J Urol* 1992;147:695-7.