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Pulmonary and cutaneous vasculitis following hepatitis B vaccination

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Abstract

The case history is presented of a previously healthy non-atopic woman who developed cutaneous vasculitis, confirmed by biopsy, and pulmonary problems after inoculation with recombinant hepatitis B vaccine.

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Vaccination with hepatitis B recombinant vaccine is highly effective in producing immunity in immunocompetent patients. It has few side effects, usually consisting of early local reactions to the thimerosal or aluminium components of the vaccine.¹⁻³ We report a case of cutaneous vasculitis, confirmed by biopsy, who also had pulmonary problems after the first inoculation with recombinant hepatitis B vaccine.

Case report

A previously healthy 45 year old non-atopic woman taking no regular medication received her first dose of recombinant hepatitis B vaccine (20 µg in 1 ml, Engerix B; Smith, Kline and Beecham). Two days later she developed a pruritic rash on both feet which spread to her trunk and face. Over the next few days she developed breathlessness on minimal exertion, severe malaise, Raynaud's phenomenon, and a symmetrical polyarthralgia affecting her hands, wrists, elbows, and feet. In view of her multiple problems, admission to hospital was arranged.

On examination she was ill with a maculopapular rash over most of her body. Mobility of her hands was reduced because of arthralgia but no arthritis was evident. Nail bed infarcts were present along with necrosis of the distal finger pulps, in keeping with a digital vasculitis. Auscultation of her chest revealed fine inspiratory crackles at both bases. No abnormality was found in her eyes.

Figure 1 Chest radiograph on admission.

Investigations showed no microscopic haematuria; urea concentration, liver function test results, plasma viscosity, and full blood count were normal, with no eosinophilia present. The chest radiograph showed bilateral basal mottling (fig 1), and results of pulmonary function tests revealed a restrictive pattern (FEV₁/FVC ratio 80%) with small lung volumes and a gas transfer corrected for lung volume (KCO) of 69% predicted.

Figure 2 Photomicrograph of skin biopsy specimen showing perivascular infiltrate in keeping with vasculitis.

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Arterial blood gas analysis was not performed. Serological tests for rubella, mycoplasma, Epstein-Barr virus, varicella, and parvovirus showed no evidence of infection. Rheumatoid factor, antinuclear factor (ANF), and cold agglutinins were not detected and complement (C3, C4, CH50) was normal. Biopsy specimens of the rash showed a perivascular lymphocytic infiltrate in the dermis in keeping with vasculitis (fig 2).

A diagnosis of cutaneous vasculitis with probable pulmonary vasculitis due to hepatitis B vaccine was made and prednisolone, 30 mg day, was started. This produced a rapid clinical response with resolution of the rash and arthralgia. The radiographic abnormality improved over the next week and was associated with a return of her normal exercise tolerance. The steroids were continued at this dose for two weeks before being gradually reduced and stopped over two months with no return of her symptoms. Twelve months after her initial vaccination the chest radiograph and pulmonary function test results remain normal.

Discussion

The temporal relationship between vaccine administration and the vasculitis proved by biopsy sampling suggests a hypersensitivity illness with immune complex deposition. Local reactions to the components of the vaccine are uncommon.¹⁻³ There is one previous report of a systemic reaction to hepatitis B vaccination in an atopic woman. She developed generalised pruritus, urticaria, and asthma within 30 minutes of her second inoculation, but should not have received the vaccine having suffered a similar but milder reaction to the first injection.⁴

The symptoms in our patient coincided

with her first hepatitis B vaccination and were not anaphylactic in nature. The rash, distal finger necrosis, and arthralgia were in keeping with a systemic hypersensitivity reaction and associated vasculitis which was confirmed by the skin biopsy. This problem has not been recorded previously with hepatitis B vaccination.

A histological diagnosis of the respiratory problem was not sought after obtaining the skin biopsy specimen. It seems probable, however, that she also had an alveolitis based upon the marked dyspnoea, basal crackles, abnormal chest radiograph, and restrictive pattern on pulmonary function tests, all of which improved with corticosteroid treatment. Pulmonary changes after any vaccination are uncommon, and although acute hepatitis B infection may be associated with rash and arthralgia, respiratory symptoms and signs are rare.⁵

Given the widespread use of hepatitis B vaccination, it is clear that such hypersensitivity reactions are uncommon. In view of the severe nature of the reaction, however, medical staff should be aware of this potential problem.

The Committee on Safety of Medicines and the manufacturers have been informed of this reaction.

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