Mohandas *et al.* 1978). Robson *et al.* (1981) described two cases where Aspergillus involving the paranasal sinuses spread to the base of the skull. Rarely, aspergillosis may be limited to the brain (Linares *et al.* 1971, Bhalla *et al.* 1980). Where this is so, the granulomata are most commonly found in the frontal lobes, which suggests spread from the nose or paranasal sinuses.

There are two main types of Aspergillus infection of the paranasal sinsuses (Young *et al.* 1970). One is most commonly found in hot, dry climates such as in the Sudan (Milosev *et al.* 1969, Mohandas *et al.* 1978). It is commonest in female subjects and *A. flavus* is the usual species. Invasion of surrounding structures is not uncommon. The second type is commonest in temperate climates and may be diagnosed accidentally when antral washings are cultured; in these cases *A. fumigatus* is the commonest species (Sandison *et al.* 1967). The infection is rarely invasive or progressive.

The prognosis with surgery is unpredictable. Some subjects have died within hours of surgery, probably as a result of the release of endotoxins with resultant anaphylaxis. Others have died later from widespread aspergillosis – presumably a consequence of the surgery itself.

The appearance of a solitary aspergilloma in this patient without evidence of underlying disease, immunodeficiency or aspergillosis elsewhere is remarkable.

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Dapsone in allergic vasculitis: its use in Henoch-Schönlein disease following vaccination[1]

J A Ledermann MB MRCP
B I Hoffbrand DM FRCP
Whittington Hospital, London N19 5NF

Dapsone, a sulphone, is well known for its use in the treatment of dermatitis herpetiformis. It has also been used successfully in other inflammatory skin diseases (Lang 1979), including allergic vasculitis (Main 1967, Wells 1969, Thompson *et al.* 1973). Erythema elevatum diutinum, which in common with allergic vasculitis is a leukocytoclastic vasculitis, seems particularly responsive to dapsone (Katz *et al.* 1977). Henoch-Schönlein disease, a syndrome of allergic vasculitis, is often encountered in general medicine; but there have been no reports of the use of dapsone in the treatment of this condition.

We describe a case of Henoch-Schönlein disease that followed typhoid and paratyphoid A & B (TAB), cholera and yellow fever vaccination, resulting in a chronic vasculitis that was successfully treated with dapsone.

Case report

A 33-year-old man presented with a rash on his feet and vague abdominal discomfort which had started two weeks after a TAB, cholera and yellow fever vaccination. On examination there was palpable purpura with some necrotic lesions on the dorsum of his feet, ankles and back of his thighs. The spleen was not palpable. The urine contained red cells but no protein.

Investigations showed haemoglobin 15.6 g/dl; white cell count 8.1×10^9/l, with a normal differential count; platelets 231×10^9/l. The ESR was 2 mm/h. Clotting profile and renal function tests were normal. Antinuclear factor, rheumatoid factor, and serological tests for syphilis were negative. The antistreptolysin titre was not elevated. Complement studies and immunoglobulins were normal and circulating immune complexes were not detected.

He developed transiently swollen ankles and episodes of diarrhoea and vomiting. As old lesions faded, new ones appeared. The purpura spread above his waist. He was given dapsone 50 mg twice daily, and his symptoms cleared within two days. Over the next six months whenever he tried to stop dapsone he developed fresh purpura within one to two days. A short course of prednisolone, 30 mg/day, produced no clinical response. The dose of dapsone was

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gradually reduced, and he was well without medication after nine months. However, he relapsed following an upper respiratory tract infection. As the rash, arthralgia and gastrointestinal symptoms persisted, he was restarted on dapsone. He is currently well on dapsone 75 mg daily, although microscopic haematuria is still present.

Discussion

The vasculitic skin lesions in this patient were very sensitive to dapsone, disappearing after two days' treatment. Relapse occurred within 48 hours of stopping the drug. This pattern of response has been seen in other cases of allergic vasculitis treated with dapsone (Vollum 1968, Cream *et al.* 1971, Thompson *et al.* 1973, Katz *et al.* 1977).

Dapsone appears to control cutaneous vasculitis rather than cure the underlying condition, as the response could be demonstrated on several occasions in this patient and in others (Thompson *et al.* 1973, Katz *et al.* 1977). The persistent haematuria suggested that not all components of the disease were sensitive to dapsone. The relapse after an upper respiratory tract infection in this patient, which may imply a sensitivity to other triggering antigens, was also controlled by dapsone.

Minor reactions to TAB vaccination are frequently observed. The association of Henoch-Schönlein disease with TAB vaccination is very unusual, but it has previously been reported (Robertson & Leonard 1956). Vasculitis appeared within ten days of the first inoculation and, unlike the present patient in whom chronic vasculitis developed, the other reported cases were self-limiting, lasting two to three weeks.

Allergic vasculitis has not been described in association with cholera or yellow fever vaccination; but there have been cases of Henoch-Schönlein disease in association with smallpox, measles and influenza vaccination (Lane 1969, Mastroiacovo 1976, Blumberg *et al.* 1980).

A variety of antigens have been associated with allergic vasculitis (Ryan 1976) and the development of vasculitis may depend on the quantity of antigen present or the host response. Although many factors in the pathogenesis are poorly understood, allergic vasculitis is most likely to be immune complex mediated, with complement activated by antigen-antibody complexes of a critical molecular size (Ethington & Jordan 1981). This could result in an Arthus-like reaction, which has many histological similarities to vasculitis, and when produced in animals serves as a useful experimental model (Sams 1980).

The action of dapsone in allergic vasculitis is not fully understood. It has been shown to inhibit the experimentally-induced Arthus reaction in guinea-pigs (Thompson & Souhami 1975). A major action of dapsone seems to be as an anti-inflammatory agent. Dapsone inhibits neutrophil myeloperoxidase-H_2O_2-halide mediated cytotoxicity (Stendahl *et al.* 1978).

Although the relationship between the clearing of crops of purpura and the use of dapsone was clear-cut in this patient, the effect of therapeutic agents in Henoch-Schönlein disease is usually difficult to assess due to its unpredictable natural history. The place of corticosteroids remains unclear; in this patient there was no response. We have had at least one other apparent satisfactory response in clearing crops of purpura in a young woman with Henoch-Schönlein disease who had biopsy-proven glomerulonephritis (unpublished). In a number of other cases, including one associated with squamous cell lung cancer (Mitchell & Hoffbrand 1979), there was no apparent response. It may be that this is a subset of a heterogeneous condition.

The proven value of dapsone in cutaneous allergic vasculitis is perhaps not widely appreciated in general medical practice. The place of dapsone in the treatment of Henoch-Schönlein disease and vasculitic renal disease needs further assessment.

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