Case report

Eosinophilic transient synovitis

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Eosinophils are rarely found in either the synovial fluid or the synovial membrane. Ropes and Bauer¹ found less than 1% eosinophils in all but 2 of 1200 synovial fluid samples which they examined. Naib² did not find eosinophils in synovial fluid in a variety of disorders. However, significant eosinophilia of synovial fluid has been reported in single cases as a result of arthrography,³ metastatic adenocarcinoma,⁴ guinea-worm infestation,⁵ and radiation.⁶

Patients with rheumatoid arthritis may develop peripheral eosinophilia not as a primary event but in association with extra-articular manifestation.⁷⁻¹² However, even in such cases eosinophils are rarely detected in the synovial tissues.^{10, 11} Thus synovial fluid possibly does not mirror the peripheral blood eosinophil count.¹³

The present communication is a report of an atopic child with peripheral blood eosinophilia and monoarthritis. There were large numbers of eosinophils in the synovial fluids and membrane. The disease was self-limiting and defied classification into any of the known categories. So far as we could ascertain from the English-language literature up to 1980 such an arthritis has not been reported in an atopic individual.

Case report

A 10-year-old male child, the son of an Indian professor working in Mosul, was brought to the Outpatient Department of Mosul Republican Hospital on 18 April 1979 with a complaint of pain and swelling of the left knee joint, and with no history of antecedent trauma. The child had been complaining of slight pain during walking for 5 days. There was no history of fever or morning stiffness, but the child had suffered repeated attacks of nasal and pharyngeal catarrh, the last being about 8 months previously. The father had a similar history of upper respiratory catarrh of long duration associated with peripheral blood eosinophilia. He recalled a severe 'eosinophilia problem' once. The grandfather also used to suffer from upper

respiratory tract infection. The mother and 2 siblings had no such problem. The family had lived in Iraq, the USA, and India during the last 4 years.

On examination the patient was of asthenic build. His temperature was 37.8°C. The left knee joint was swollen, slightly warm, and showed signs of effusion. All movements were painful. He had a slight generalised lymphadenopathy but no hepatosplenomegaly. Neither rash nor nodules were detected in the skin. The cardiovascular system was normal.

Laboratory and x-ray studies. Haemoglobin was 80% with normochromic, normocytic cell picture; leucocytes $11.4 \times 10^9/l$, with 20% eosinophils. The erythrocyte sedimentation rate (ESR) was 5 mm/1st hour. Subsequently the ESR ranged from 35 to 37 mm/1st hour, while the eosinophils dropped to 5-7%. Routine stool and urine examinations gave normal results. Tests for rheumatoid factor and lupus erythematosus cells were repeatedly negative. Anti-streptolysin O titre: 1/12 Todd unit. The serum electrophoresis pattern was normal. Widal tests against brucella and enteric organisms were negative. Tuberculin and Casoni tests were negative. X-ray of the knee showed effusion with very mild osteoporosis of bones. The chest x-ray was normal. An electrocardiogram did not reveal any abnormality.

With the possibility of septic arthritis in mind the joint was explored the next day, and a slightly opalescent straw coloured synovial fluid was collected. The synovial membrane was thick and granular. The articular surfaces appeared normal. A synovial biopsy was taken. The joint was kept on continuous penicillin wash for 4 days. While the patient was in hospital his temperature ranged between 37 and 38°C. He was given prednisolone for 10 days and was discharged on 5 May 1979 free of symptoms and with a full range of movements of the knee joint. No further treatment was prescribed. To date, the patient has had no recurrence of his arthritis either in the same joint or in any other. He still suffers from attacks of nasopharyngeal catarrh.

Synovial fluid and biopsy. The total cell count was $10.5 \times 10^9/l$, with eosinophils 68%, lymphocytes 15%, other mononuclear cells including mesothelial

Accepted for publication 7 July 1982.

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Fig. 1 The synovial membrane shows villous formation oedema, marked cellular infiltration, and increased vascularity. (H and E, $\times 100$).

Fig. 2 The cellular infiltrate is mainly of eosinophils, with a few lymphocytes and histiocytes. (H and E, $\times 400$).

cells 27%. Bacteriological culture for pyogenic organisms and mycobacteria was negative.

Histopathology. The synovial lining showed proliferation up to 8 or 10 cells thick, with formation of short villi (Fig. 1). There was a marked increase in dilated venules and capillaries, with prominent endothelial lining. There were no thrombi, no blockage of the vascular lumina, and no necrosis of their walls.

A remarkable feature was the extensive degree of infiltration of the synovial lining and the areolar connective tissue by inflammatory cells. Most were eosinophils, but there were also some mast cells, lymphocytes, and histiocytes (Fig. 2). The cellular infiltrate was concentrated around vessels. No neutrophils or plasma cells were identified. The eosinophils were seen between the proliferated synovial lining and the walls of blood vessels (Fig. 2). There were no fibrin deposits, no extravasation of red cells, and no haemosiderin deposition in the tissues.

Discussion

This patient, an Indian child with atopic history and eosinophilia, presented with monoarthritis, lymphadenopathy, and fever. The possibilities of septic, tuberculous, and juvenile rheumatoid arthritis

(JRA), were considered. However, examination of synovial fluid and tissues excluded the first 2. There are no universally accepted criteria for the diagnosis of JRA. The problem is even greater with a monoarticular onset in the initial stages, when other systemic manifestations may not have appeared. Rheumatoid factors are usually absent, and the histology of the synovial membrane shows nonspecific inflammation.¹⁴⁻¹⁶ Nonpersistent arthritis has not been considered to represent JRA.¹⁴⁻¹⁶ In the present case the arthritis was transient. There was complete recovery within about 6 weeks and no recurrence on follow-up 2 years 8 months later. The course of the disease was similar to what Schumacher and Kitridou¹⁶ called 'transient synovitis'. The synovial fluid had 68% eosinophils and no neutrophils. This also is unlike the cytology of synovial fluid in JRA.¹⁴⁻¹⁶ Rheumatic fever was never considered seriously as a differential diagnosis in our case owing to the non-migratory monoarthritis, normal antistreptolysin O titre, and normal ECG. In a study of 62 synovial fluids from patients with acute rheumatic fever only 4 showed eosinophilia of 1-2%.¹⁷

Earlier case reports of synovial fluid eosinophilia^{3-6, 14} had a known aetiological factor operating locally—for example, contrast media, metastatic carcinoma, worm infestation, and local irradiation. No atopic history or any other systemic or local disease was found in the case reported by Podell *et al.*¹³ They considered that the eosinophilia was probably due to an unknown stimulus. Their patient developed peripheral blood eosinophilia a week after the arthritis.

Brogadir *et al.*¹⁸ reported the first case of joint involvement in hypereosinophilic syndrome. There were no eosinophils in the synovial fluid, but some eosinophilic infiltration of the synovial tissue was present. In the group of poorly understood cases of fasciitis variously called Shulman fasciitis,^{19, 20} eosinophilic fasciitis,²⁰ or diffuse fasciitis²¹ joint involvement is rare.^{20, 21} The case reported by Rosenthal and Denson,²¹ had multiple allergies and slight eosinophilic infiltration of synovial membrane. Thus there is nothing to suggest that our case is related in any way to any of these disorders.

We are at a loss to suggest the possible aetiology and mechanism in the present case. The patient has a definite atopic history and peripheral blood eosinophilia. In cases of atopy it is common to find inflammation and eosinophilic infiltration in the target organ systems, such as gastrointestinal,²² respiratory,²³ and urinary.²⁴ Can the same analogy hold true here? If so, one would have expected more cases to be reported by now. We have been unable to find any up to 1980.

Our lack of understanding of the basic patho-

genesis of tissue infiltration by eosinophils has led various authors to call lesions by morphological names like eosinophilic cystitis,^{24, 25} meningitis,²⁶ cholecystitis,^{27, 28} gastroenteritis,²² pleuritis,²⁹ and fasciitis.³⁰ We consider that until we have a better understanding of cases like the present and that of Podell *et al.*¹³ they should be called 'eosinophilic transient synovitis'.

Our gratitude is due to Professor B. C. Sangal for help and advice.

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