Coexistent gout and rheumatoid arthritis: a case report

Introduction

Diseases mimicking rheumatoid arthritis (RA) include chronic tophaceous gout (CTG), systemic lupus erythematosus, Sjögren's syndrome, osteoarthritis, psoriasis and pseudogout (Schapira et al, 1999; Ho et al, 2003). There is a negative association between gout and RA, and their coexistence has been scarcely reported since Hutchinson's report (1881). RA may precede associated gout, but CTG is commonly the initial disease. This article reports a case of a 56-year-old man with hypertension, end-stage renal disease and CTG. Three years later, he fulfilled the diagnosis criteria for RA, with biopsy findings of rheumatoid nodules. A literature review of data from eighteen cases describing the coexistence of gout and RA was performed to better understand the features useful for diagnosis. Details of the references used can be obtained from the corresponding author.

Literature review

The patient's clinical, laboratory, radiograph and histological reported data were reviewed, and compared with previous descriptions. The patients' mean age was 57.2 ± 12.8 years, 63.2% were white and 79% male. Gout preceded RA in 52.6% of cases. RA occurred in 64.7% and gout in 41% of biopsies. Bilateral lesions in three or more joints, cysts and erosions were the predominant changes. All patients showed subcutaneous nodules and monosodium urate (MSU) crystals; 88.9% had hyperuricaemia and 78.9% developed tophi. High titres of rheumatoid factor (RF) occurred in 94.7%. Mean erythroctye sedimentation rate was 67.5±35.8 mm/h, median 60 mm/h. Medications used to treat these patients included allopurinol in 77.8%, non-steroidal anti-inflammatory drugs 77.8%, colchicine 66.7%, corticosteroids 44.4%, and salicylates 33.3% of cases.

Case Report

A 56-year-old Brazilian man, non-alcoholic, with no family history of arthritis, complained of weight loss and fever during haemodialysis. Over the previous 3 years he had asymmetric podagra responsive to colchicine and allopurinol, and developed subcutaneous nodules in fingers and forearms, where tophi of monosodium urate crystals were found on needle aspiration. He also had recurrent symmetric polyarthritis in wrists and hands without morning stiffness. On admission his temperature was 36.5°C. The heart was rhythmic at 99 beats per minute and blood pressure 190/110 mmHg. The lungs were clear and respiratory rate 20 incursions per minute. The liver was normal and the spleen was enlarged. Symmetric nodules were found in the third proximal interphalangeal hand joints (*Figure 1*) and near the elbows (*Figure 2*) without rheumatoid deformities.

The results of blood tests were as follows: erythrocytes 2.77x10^6/mm^3, haemoglobin 8.1g/dl, haematocrit 25.9%, leukocytes 13 100/mm^3 (neutrophils 72%, lymphocytes 20%), platelets 280 000/mm^3, erythrocyte sedimentation rate 89 mm/hr, albumin 3.6 g/dl, globulins 4.8 g/dl, Bence-Jones proteinuria negative, uric acid 11.3 mg/dl, iron 57 μg/dl, glucose 84 mg/dl, urea 93 mg/dl, creatinine 8.4 mg/dl, sodium 135 mEq/litre, potassium 4.8 mEq/litre, calcium 1.44 mmol/litre, phosphorus 5.3mg/dl, aspartate transaminase 20U/litre, alanine transaminase 33U/litre, gamma-glutamyl transpeptidase 170 UI/litre, triglycerides 101 mg/dl, cholesterol 117 mg/dl. C-reactive protein 4.8 mg/dl, acid alpha1-glycoprotein 235 mg/dl, rheumatoid factor 82.3 UI/dl, antinuclear, anti-DNA, and anti-microsomal antibodies negative. Complement levels were C3 116 mg/dl and C4 55 mg/dl. Tests for hepatitis C and toxoplasmosis immunoglobulin G were positive; and hepatitis B, brucellosis, mononucleosis, syphilis and human immunodeficiency virus were negative.

Radiograph of hands showed cortical erosions in the third proximal interphalangeal joints, with normal joint spaces, erosions and cysts in metacarpal epiphyses, with symmetrical periarticular osteoporosis and soft tissue swelling (*Figure 3*). Medial epicondyle erosion with overhanging edges and fluffy calcifications of chronic tophaceous gout (Monu and Pope, 2004) were seen in the left olecranon.

Biopsy of subcutaneous nodule disclosed granulomas with central zones of fibrinoid necrosis surrounded by palisades of mononuclear cells (*Figures 4* and *5*), and characterized rheumatoid arthritis coexistent with gout.

Figure 1. Symmetric subcutaneous nodules over the third proximal interphalangeal hand joints, and absence of the classical rheumatoid deformities.

Figure 2. Bilateral subcutaneous nodules in the extensor area of forearms, near the elbows.

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Figure 3. Radiograph of hands showing cortical erosions in the third proximal interphalangeal joints with preserved articular space and erosions with cysts in metacarpal epiphyses, in addition to periarticular osteoporosis and symmetrical soft tissue swelling.

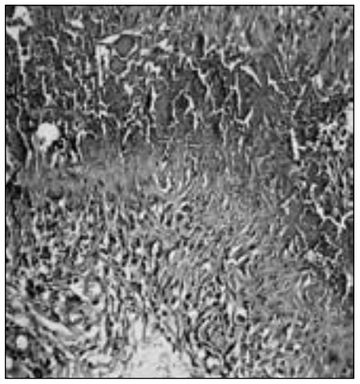

Figure 4. Micrograph of subcutaneous nodule biopsy showing granuloma with central fibrinoid necrosis surrounded by palisade of epithelioid and mononuclear cells, characteristic of rheumatoid nodule (haematoxylin-eosin x 100).

Most of these reports appeared after literature reviews had appeared, which favours the hypothesis of underestimated association.

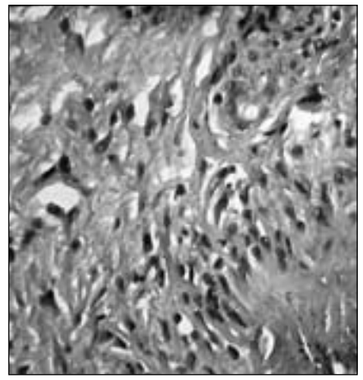

Figure 5. Detail of the subcutaneous rheumatoid nodule (haematoxylin-eosin x 400).

Discussion

In this case, the patient was suffering from RA coexistent with CTG. The diagnosis of gout was based on clinical data, hyperuricaemia with CTG, MSU crystals in tophi and radiograph features (Arnett et al, 1988; Monu and Pope, 2004). In addition to biopsy findings of rheumatoid nodule (Schapira et al, 1999), the diagnosis of RA was based on five of the seven 1987 revised classification criteria:

1. Soft tissue swelling of proximal interphalangeal and metacarpophalangeal hand joints
2. Symmetrical soft tissue swelling
3. Subcutaneous nodules
4. Highly positive RF
5. Erosions and/or periarticular osteopenia on radiograph of the hands (Arnett et al, 1988).

The end-stage renal disease could represent the immunosuppressive condition that may alter the expected mutual exclusivity of gout and RA (Wallace et al, 1979). This apparent exclusion includes the inhibitory role of connective tissue and synovial fluid changes of RA upon the crystal deposition and phagocyte function, in addition to the immunosuppressive action of MSU crystals and the effect of RF on the crystal–neutrophil interactions (Wallace et al, 1979; Zonana-Nacach et al, 1996; Schapira et al, 1999).

A possible concern could be chronic gout arthritis mimicking RA (Rizzoli et al, 1980; Schapira et al, 1999; Ho et al, 2003). However, as seen in many other descriptions, this patient was initially found to have tophi with MSU crystals and, 3 years later, he showed characteristic rheumatoid nodules on biopsy study. These were the main features that established the correct diagnosis in this case. BJHM

Arnett FC, Edworthy SM, Bloch DA et al (1988) The American Rheumatism Association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis Rheum* **31:** 315–24

Ho HH, Lin JL, Wu YJJ, Yu KH, Chen JY, Luo SF (2003) Gout in systemic lupus erythematosus and overlap syndrome – a hospital-based study. *Clin Rheumatol* **22:** 295–8

Hutchinson J (1881) Parts of joints showing the changes of gout and rheumatoid arthritis in the same patient. *Pathol Soc Lond Trans* **32:** 193

Monu JUV, Pope TL (2004) Gout: a clinical and radiologic review. *Radiol Clin N Am* **42:** 169–84

Rizzoli AJ, Trujeque L, Bankhurst AD (1980) The coexistence of gout and rheumatoid arthritis: case reports and a review of the literature. *J Rheumatol* **7:** 316–24

Schapira D, Stahl S, Izhak OB, Balbir-Gurman A, Nahir AM (1999) Chronic tophaceous gouty arthritis mimicking rheumatoid arthritis. *Semin Arthritis Rheum* **29:** 56–63

Wallace DJ, Klinenberg JR, Morham D, Berlanstein B, Biren PC, Callis G (1979) Coexistent gout and rheumatoid arthritis. Case report and literature review. *Arthritis Rheum* **22:** 81–6

Zonana-Nacach A, Alarcon GS, Daniel WW (1996) Rheumatoid arthritis preceding the onset of polyarticular tophaceous gout. *Ann Rheum Dis* **55:** 489–90