Ankylosing spondylitis in west Africans—evidence for a non-HLA-B*27 protective effect

Dr Brown and his colleagues^1 are to be congratulated for performing a logistically formidable, but necessary, epidemiological study testing the currently in vogue hypothesis that the B*2703 subtype of HLA-B27 is not related to ankylosing spondylitis (AS). They conclude that the B*2705 subtype, as well as B*2703, possesses a lower risk for developing AS in a group of B27 positive west Africans, the Fula from Gambia, when compared to white positive subjects following the potential protective role of an environmental factor(s). This conclusion is based on an assumed risk of developing AS in B27 positive persons of 11.1% for men and 1.5% for women. No cases of AS were seen among 900 adult Fula men and 215 first degree relatives of 48 B27 positive Fula twin pairs. We would argue that the data warrant the more conservative conclusion implied in that discussion, namely, the risk of AS among B27 positive Fula subjects would need to be at least 2.7% in men and 1% in women to assign significance to the finding of no AS in this population.

The risk of developing AS in HLA-B27 positive subjects clearly varies among different ethnic groups, but it is now generally accepted that among white populations, the prevalence of AS is nearer 1–2% rather than 11.1%.^1 In a Norwegian survey of 14 593 subjects quoted by the authors is in fact based on a highly selected sample of only 375 people responding positively to a questionnaire for low back pain or stiffness who actually turned up for examination and had x rays of sacroiliac joints. You arrive at an entirely different conclusion if you apply the AS prevalence figures of 1.4% for B27 subjects from the Russian population study or 1.3% of Dutch B27 positive subjects. The second study examined 2956 subjects older than 44 years who all had sacroiliac x rays and only three B27 positive subjects had AS according to the New York criteria leading to a prevalence of 0.1%. Recalculating the data of Brown et al according to these more generally accepted prevalence rates leads to the following conclusions. The probability of observing no cases of AS in 900 adult Fula men would be 46.9% (that is, p=0.47). The number of B*2703 persons expected to develop AS would be zero, as in fact observed in this population. Even assuming a risk of 2.7% for AS in B27 positive subjects, the likelihood that no cases of AS would be found in 900 adult Fula men is 23.2% (that is, p=0.0323). Furthermore, we calculate that the prevalence of AS in the population of B27 positive adult Fula men would need to be at least 5.5% before the finding of zero observed cases of AS in 900 adult Fula men would be statistically significantly different.

We would like to thank Dr Maksymowych for his interest in our study. We agree with his conclusion that our study shows that B27 is not associated with ankylosing spondylitis (AS) in the Gambia. However, the risk of AS in B27 positive men is greater than 2.7% and women is greater than 1% (which we believe to be the case). We feel that most of his criticisms can be satisfactorily answered.

The risk of developing AS in B27 positive subjects is uncertain. The studies mentioned by Dr Maksymowych are among the lowest estimates that have been reported for white populations. Other studies have reported that as many as 20% of B27 positive subjects may develop the disease. The survey by Gran et al is by far the largest reported: 21 329 subjects were invited to participate in a study of cardiovascular disease, of whom 16 621 attended screening sessions. Of these, 14 593 (87%) completed questionnaires including x rays and only 449 did; 375 of these had sacroiliac radiographs. From this group a random sample of 806 were invited to attend for clinical screening, of which 449 did, 375 of these had sacroiliac radiography. Comparisons at each step demonstrated that selection bias was minimal. We believe therefore that not only is this study significantly larger than either of the studies mentioned by Dr Maksymowych, but is also reliable. It is also the only study of sufficient size to determine the risk for AS among men and women with B27 separately, which was a requirement for our analysis.

The risk for AS among B27 positive men is significantly greater than among B27 positive women. In our study 1008 participants were male and 107 female. Therefore it was important to use sex-specific risk estimates, which Dr Maksymowych has not used in his calculations. Also, the study examined 215 relatives of 48 B27 positive subjects in addition to the 900 adult Fula men used in Dr Maksymowych’s calculations. Analysing the total study population (n=1115), we found that the two studies showed a risk of AS associated with B27 in the Gambia (p=0.05), assuming that the risk of AS was ≥1.85% in B27 positive subjects, and that men were 2.7 times more likely to develop disease than women (both of these assumptions are conservative). Using a higher male/female ratio would allow us to exclude lower degrees of association of B27 with AS.

Our study confirmed the previous finding that AS is extremely rare in west Africa—indeed no case has yet been reported from the Gambia. This is despite the prevalence of B27 being as high as 7.8% in some ethnic groups. The fact that 68% of B27 positive subjects in this area carry B*2705 indicates that it is not a difference in B27 subtypes that explains the rarity of the disease. Furthermore, two separate groups have now reported cases of AS in B*2703 subjects. It remains possible that B*2703 has a lower risk for AS than other B27 subtypes. However AS is not associated with either B*2703 or B*2705 in the Gambia. Future comparisons of the strength of association of B27 subtypes with AS need to consider ethnic differences. Dr Maksymowych’s calculations also showed that sex differences between the populations studied.

Matthew Brown
Paul Wordsworth


Authors’ reply

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aware of this fact, although the emphasis in current general and rheumatological publications and text books is that this is an unusual occurrence.1 2 We have conducted a prospective study to determine the frequency of normal SUA values in acute gout and also to compare acute and intercritical values.

Over a period of three years we observed 38 consecutive patients during 42 episodes of acute gout and who had the following characteristics: 34 men, four women, age 40–80 years mean 54; inpatients 16, domiciliary visits 9, Accident and Emergency 7, and clinic 10. Chronic diuretic drug use was implicated in eight and excessive alcohol in four GPs home visits all patients were seen by one of us during the acute bout. Urate estimations after the episode were made either before commencement of allopurinol or within three months. Values before the episode (within six months) were available from the files of 20 patients. The upper limit of the normal range of SUA in our laboratory is 0.45 mmol/l in men and 0.38 in women. Figure 1 shows the SUA values for the acute and intercritical phases. The respective median values were 0.44 and 0.56 mmol/l for the whole group and 0.42 and 0.54 mmol/l for crystal verified cases (p = 0.004, Mann-Whitney). During the acute episode a normal SUA value was found in 43% as follows: 16 men and two women; 11 of 22 monoarticular, five of 12 polyarticular, and two of four chronic tophaceous gout; four of 10 excessive alcohol, three of eight unspecified type and Hadler et al in 39% of polyarticular episodes. Both were retrospective case record studies, which may yield inaccurate prevalence data. In our prospective study a normal SUA occurred more often than is generally appreciated during the acute episode and occasionally at other times. We believe that highlighting the differences in the range of values in acute and intercritical gout in medical textbooks and laboratory reports will increase diagnostic accuracy and improve patient management.

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Figure 1 Urate values in acute and interval gout.

Giant cell arteritis of the leg in a patient with hepatitis C virus infection

The potential association of chronic hepatitis C virus (HCV) infection with a variety of dermatological features has been reported.3 In particular, it has been observed that different types of cutaneous vasculitis may develop during the course of HCV infection,4 such as mixed cryoglobulinaemia related leucocytoclastic vasculitis and polyarteritis nodosa.

We report a case of giant cell arteritis (GCA) involving the medium sized dermal arteries of the right leg, which appeared after a long history of HCV infection.

A 44 year old man with an eight year history of chronic hepatitis was admitted to the Rheumatology/Clinical Immunology Units of the University of Pisa in July 1995 because of erythematous cutaneous nodules on the legs. Chronic hepatitis had been suspected since 1987 because of raised, fluctuating values of hepatic enzymes. In 1993 the diagnosis was confirmed by liver biopsy. In June 1995 the presence of anti-HCV antibodies was demonstrated by an ELISA test. From the time of the histopathological assessment of chronic hepatitis to that of the appearance of the cutaneous nodules the patient was not receiving any medical treatment.

At the time of his stay in hospital the patient underwent a complete physical examination, which showed no abnormalities except for the cutaneous lesions. These were tender, red, and painful nodules situated on the medial side of the right leg, which appeared to be confluent in some areas.

Routine laboratory investigation showed only a moderate increase of the acute phase reactants (erythrocyte sedimentation rate 20 mm 1st h, C reactive protein 2.9 mg/dl, fibrinogen 600 mg/dl).

Antineutrophil cytoplasmatic antibodies (ANCA), antinuclear antibodies, immune complexes, and cryoglobulins were absent. Hepatitis B virus markers (antibodies to hepatitis B, anti-HBc, and anti-HBe, and the HBs and HBe antigens) were not detected in the serum, nor were the antibodies anti-HIV1 and -HIV2.

On the contrary, anti-HCV antibodies were found using a third generation ELISA test (Abbott HCV EIA 3.0, Abbott Diagnostics, Wiesbaden-Dielenkheim, Germany). A qualitative ‘dot’ assay (Abbott HCV MA-TRIX, Abbott Diagnostics, Wiesbaden-Dielenkheim, Germany) showed that these antibodies were directed to the HC-34 core and HC-29 NS3 recombinant proteins, while there was no serological reactivity against the c-100-3 NS4, HC-23 NS4 viral recombinant antigens.

The presence of viral RNA (indicative of active HCV replication) in the serum was demonstrated by a polymerase chain reaction

cytes or macrophages, elements originate from the fusion of monocytes or granulomas are the histopathological hallmark of two clinical entities, Takayasu’s arteritis and Horton’s arteritis. In the first the aorta and its branches (including the proximal coronary and renal arteries) are generally involved; in the second the temporal artery is classically affected and, more rarely, the extracranial or intracranial branches of the carotid.

The typically sudden onset of GCA, accompanied by fever and other generalised complaints, has raised the possibility that the disorder may be triggered by an infection although a convincing experimental support is lacking. However, a retrospective epidemiological study has shown that Horton’s arteritis exhibits a regular, cyclic pattern of incidence, thus indirectly supporting the hypothesis of an infectious cause.

It is known that different vasculitides may occur in HCV infected patients. Leucocytoclastic small vessel vasculitis has been widely reported in patients with chronic HCV infection and circulating mixed cryoglobulins. At the same time, conflicting data exist on the possible association between HCV infection and panarteritis nodosa.

This case adds yet another to the list of the different vasculitides that may be associated with HCV infection, and in addition provides support for the interesting, but as yet unproved hypothesis that granulomatous vasculitides of the medium sized vessels, including giant cell arteritis, may be an antigen driven process, possibly triggered by an infectious agent.  

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Long term follow up of von Willebrand factor and plasminogen activator inhibitor-1 in patients with polymyalgia rheumatica

In polymyalgia rheumatica (PMR) subclinical vasculitis is suggested in the pathogenesis of the disease. Von Willebrand factor (vWF), produced by endothelium and megakaryocytes, is an important haemostatic factor. In healthy people with ABO blood group O, vWF values are lower than those of people with a blood group other than O. Increased plasma concentrations of vWF indicate endothelial damage and are found in diseases that involve blood vessels including vasculitis. In PMR and giant cell arteritis high vWF concentrations persist after acute phase proteins are normalised, but a gradual decline over time is also reported. Plasminogen activator inhibitor-1 (PAI-1) is an inhibitor of tissue plasminogen activator and is released from endothelial cells. Decreased fibrinolysis because of increased plasma concentrations of PAI-1 are associated with vasculitis in rheumatoid arthritis. Glucocorticoids induce PAI-1 synthesis and genetic variation affects individual concentrations.

We studied the plasma concentrations of vWF and of PAI-1 in PMR patients over time as the inflammation receded. The potentially confounding impact of ABO blood group and...
of corticosteroid treatment on these values were also evaluated.

Thirty seven patients (25 women, 12 men), mean (SD) age 70 (8) years, with PMR (criteria of Bird et al) were prospectively followed up until 1996. Follow up blood samples were collected from 31 of the original 37 patients after a median time of 5.8 years (range 3.0–8.8). Five patients died during the observation period and no blood sample was available from one patient. For analysis of vWF and PAI-1, blood was collected in the morning. vWF and PAI-1 were measured as previously described.

The plasma concentrations of vWF and PAI-1 increased significantly (p<0.05), while erythrocyte sedimentation rate (ESR), C reactive protein (CRP), fibrinogen and platelets decreased (p<0.0001) (table 1). From these results we conclude that even clinically inactive and not receiving treatment (n=16), median 190% (137–238). PAI-1 increased significantly in patients taking prednisolone, from median 8.9 IU/ml (6.7–11.6) at diagnosis to 11.6 IU/ml (9.4–25.3) at follow up (p<0.05), but not in patients who had completed their treatment, median 11.2 IU/ml (6.4–17.0) to 11.8 IU/ml (8.6–13.8) at follow up. In patients with non-O blood groups there was a correlation (Spearman rank test) between vWF and ESR, CRP, fibrinogen, and age at disease onset (r=0.61, r=0.62, r=0.79, r=0.01, p<0.05, p<0.01, respectively), but not in patients with blood group O. PAI-1 correlated with CRP (r=0.39, p<0.05) in all patients at diagnosis. There were no differences in ESR, CRP, fibrinogen, and platelet count between patients with and without blood group O.

From these results we conclude that even in an inflammatory disease such as PMR, the ABO blood group and age influence the magnitude of the vWF concentrations and may explain the contradictions pertaining to vWF values reported in inflammatory diseases. In agreement with our earlier study PAI-1 values remained unchanged in PMR patients after several years of prednisolone treatment. Persistently high concentrations of vWF about six years after PMR diagnosis, suggest a continuous vascular dysfuncion despite clinical and laboratory determined remission.

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Septic arthritis caused by *Mycobacteria hominis* is rarely diagnosed. We present a case of *M. hominis* septic arthritis in a renal transplant recipient.

A 36 years old white man receiving haemodialysis was admitted to hospital for renal transplantation. Two weeks later, while taking cyclosporin A, azathioprine, prednisolone, vanuconazole, aztroneam, and vancomycin, he developed inflammation of the right knee.

Serological examinations for cytomegalovirus (Ig G and M), hepatitis B and C, HIV, and Epstein-Barr virus were negative. A Mantoux test was positive. On physical examination he was not febrile and had arthritis of the right knee.

Laboratory findings included a whole blood cell count of 9570/mm³, packed cell volume 22%, platelet count 224 000/mm³, creatinine 5 mg/dl, and uric acid 9 mg/dl. A chest radiograph was normal. A right knee roentgenogram showed soft tissue swelling without erosions or bone lesions. Arthrocentesis yielded 60 cc of cloudy yellow synovial fluid containing white blood cell count of 50 000/mm³ (80% polymorphonuclear neutrophils), glucose 114 mg/dl, and lactate dehydrogenase 341 IU/l; no crystals were seen. A direct Gram stain of the aspirate showed no microorganisms. There was no bacterial, fungal, and mycobacterial growth on cultures. Arthritis recurred and two further arthrocenteses were performed. The last aspiration revealed 120 cc of cloudy yellow synovial fluid containing white blood cell count of 50 000/mm³ (80% polymorphonuclear neutrophils), glucose 30 mg/dl, and lactate dehydrogenase 728 IU/l. Deep venous thrombosis in the right leg was diagnosed and antiagulant treatment was started. Twenty four hours later he developed a spontaneous haemarthrosis in the knee. Because there was no improvement of the haemarthrosis and the suspicion of septic arthritis by *M. tuberculosis* was high, open synovial biopsy with synovectomy was performed. Histological examination showed synovial hyperplasia and infiltration with polymorphonuclear cells. No granulomatous reaction nor tubercles were seen. Direct Gram and Ziehl-Nielsen stains...
reactive arthritis that is sexually acquired after 12 months of follow-up. There was no evidence of recurrent infection. Doxycycline 100 mg orally twice daily was given, and with septic arthritis.

On the second and third synovial fluid culture, the microbiology laboratory reported a growth in blood culture bottles (Bactec Plus, BACTEC 9240, BBL) from the second and third culture. Serum and tap water are frequent contaminants of tissue culture. Our patient presented with acute monarticular arthritis with clinical features that did not differentiate it from other bacterial joint infections. Synovial fluid leucocyte counts were high with a low glucose concentration. Only 17 cases of *M hominis* septic arthritis have been reported in the medical literature. There are no unifying predisposing factors of these cases, although a review of the medical literature shows that eight of these patients were immunocompromised (47%) (table 1), and only one case after renal transplantation. With only one exception, the reported cases presented with monarticular or oligoarticular arthritis involving large joints. Our case occurred in a renal transplant recipient and although, antibody deficiency is particularly prone to chronic mycoplasmal infections, serum immunoglobulin concentrations were normal. We only performed one measurement and we do not exclude transient hypogammaglobulinaemia. Optimal treatment for *M hominis* joints infections is unknown. Doxycycline apparently only suppresses and does not eradicate the infection. However, our patient had a good clinical response without recurrent arthritis. If bacterial antigens in the joint are critical in the persistence of arthritis, it is possible that the removal of the synovium contributed to the resolution of the arthritis.

We illustrate the importance of considering infection with unusual organisms in immunocompromised hosts. Correct diagnosis will be made only if mycoplasmal infection is considered, and appropriate investigations performed.

Table 1 Summary data from reported cases of immunocompromised patients with *M hominis* septic arthritis

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age/sex</th>
<th>Site of infection</th>
<th>Predisposing factor(s)</th>
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<tr>
<td>1</td>
<td>32/M</td>
<td>Knee and shoulder</td>
<td>Immunosuppressive drugs</td>
</tr>
<tr>
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<td>Immunosuppressive drugs</td>
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<tr>
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<td>Immunosuppressive drugs</td>
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<tr>
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<tr>
<td>1</td>
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<td>Knee</td>
<td>Hypogammaglobulinaemia</td>
</tr>
<tr>
<td>This paper</td>
<td>36/M</td>
<td>Knee</td>
<td>Immunosuppressive drugs</td>
</tr>
</tbody>
</table>

NS = not stated.

were negative. Normal aerobic and anaerobic cultures were also negative. Urethra, pharynx, and rectal cultures were negative. Serological tests for Salmonella, Brucella, Lyme, Q fever, Rubella, cytomegalovirus, and Epstein-Barr virus were negative. C reactive protein, rheumatoid factor, antinuclear antibody, complement, and immunoglobulin values were normal. After 48 hours incubation, the microbiology laboratory reported a growth in blood culture bottles (Bactec Plus, BACTEC 9240, BBL) from the second and third sera and tap water and are frequent contaminants of tissue culture. They may be present in commercial bovine media and were generally recognised as important pathogens. On the other hand, many mycoplasmas and bacterial L-forms are ubiquitous and not generally used for joint aspirates, and anaerobic media are generally used for bacteria growth in blood culture bottles (Bactec Plus, BACTEC 9240, BBL) from the second and third synovial fluid culture. The isolate grew as minute colonies on anaerobic agar medium and was Gram stain negative. On A7 agar (bioMérieux), it showed a typical ‘fried egg’ appearance and hydrolysed arginine and was identified as *M hominis*. Treatment with doxycycline 100 mg orally twice daily was given. The patient had a gradual response and there was no evidence of recurrent infection after 12 months of follow-up.

*Mycoplasma* sp have been associated with reactive arthritis that is sexually acquired and with septic arthritis. They do not grow satisfactorily on bacteriological media routinely used for joint aspirates, and anaerobic or special mycoplasmal media must be used. On the other hand, many mycoplasmas and bacterial L-forms are ubiquitous and not generally recognised as important pathogens. They may be present in commercial bovine serum and in tap water and are frequent contaminants of tissue culture. Our patient presented with acute monarticular arthritis with clinical features that did not differentiate it from other bacterial joint infections. Synovial fluid leucocyte counts were high with a low glucose concentration. Only 17 cases of *M hominis* septic arthritis have been reported in the medical literature. There are no unifying predisposing factors of these cases, although a review of the medical literature shows that eight of these patients were immunocompromised (47%) (table 1), and only one case after renal transplantation. With only one exception, all the reported cases presented with monarticular or oligoarticular arthritis involving large joints. Our case occurred in a renal transplant recipient and although, antibody deficiency is particularly prone to chronic mycoplasmal infections, serum immunoglobulin concentrations were normal. We only performed one measurement and we do not exclude transient hypogammaglobulinaemia. Optimal treatment for *M hominis* joints infections is unknown. Doxycycline apparently only suppresses and does not eradicate the infection. However, our patient had a good clinical response without recurrent arthritis. If bacterial antigens in the joint are critical in the persistence of arthritis, it is possible that the removal of the synovium contributed to the resolution of the arthritis.

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Giant cell arteritis of the leg in a patient with hepatitis C virus infection

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