DR. ESIRI Results comparable with ours were obtained by Saunders, Knowles, and Currie (1969). Currie (1970) produced evidence for a cytotoxic effect of lymphocytes from patients with polymyositis on muscle cells grown in culture.

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Antibody-producing Capacity in Rheumatoid Arthritis. By B. L. HAZLEMAN and H. L. F. CURREY (*The London Hospital*)

Tests for rheumatoid factor sharply separate patients with classical rheumatoid arthritis from those suffering from conditions such as ankylosing spondylitis and psoriatic arthritis. One possible explanation might be that these two populations differ in their potential humoral antibody response pattern. This was investigated by challenging 98 subjects (none of whom had suffered from typhoid or been injected with 'TAB') with a single, intradermal injection of 0.1 ml. monovalent typhoid vaccine. Blood samples taken immediately before, and 7 and 14 days after, injection were tested for typhoid agglutinins using the 'microtitre' technique. Total and 2-mercaptoethanol-resistant (MER) titres were determined. The method proved highly sensitive and the 'O' antigen titres were used for analysis as these were clearer and more reproducible than the 'H' titres. There was reasonably good correlation with the standard Vidal test. Appropriate experiments established that the presence of rheumatoid factor did not modify the 'O' titres, and that the MER titres reflected IgG activity. The opportunity was taken also to study the influence of certain drugs on this primary antibody response.

The conclusions were:

- (1) Patients with seropositive rheumatoid arthritis produced antibody responses indistinguishable from controls.
- (2) Patients with ankylosing spondylitis, psoriatic arthritis, and colitic arthritis produced responses (both total and MER) at least as great as those seen in seropositive rheumatoid arthritis.
- (3) Mean antibody responses in patients receiving azathioprine and/or prednisolone showed no evidence of suppression.
- (4) Unexpectedly, antibody responses (both total and MER) in patients receiving gold injections were significantly lower than in other rheumatoid subjects ($P < 0.01$).

Discussion

PROF. J. J. R. DUTHIE (*Edinburgh*) It seems quite clear that people using immunosuppressive drugs are not, in fact, getting any immunosuppressant effect. The drugs must be producing an anti-inflammatory effect and so why do you use a toxic drug when aspirin is just as good?

DR. CURREY Two groups of French workers (Bontoux, Kahan, Brouilhet, Amor, Delbarre, Jouanneau, Gnizdowska, 1971; Kahn and de Sèze, 1971) have reported that patients treated with chlorambucil (we do not use very

much in this country) show evidence of immune suppression, and that the degree of suppression correlates with the clinical response. I think that this does not apply to azathioprine.

DR. P. J. L. HOLT (*London*) The response to gold was interesting. Does it correspond to the clinical response? I ask this because gold is known to attach to immunoglobulins, particularly when complexed, and a low immunoglobulin response might thus be specific or non-specific (Lorber, Bovy, and Chang, 1972). We have now found that, of the non-steroidal anti-inflammatory agents so far tried, gold is the only one that suppresses complement conversion when it is accompanied by clinical improvement. It is quite dramatic in doing this and, of course, the rheumatoid factor titre also tends to fall (Versey and Holt, unpublished).

DR. CURREY We failed to show any correlation in the gold-treated groups between the reduction in response and clinical activity. Our groups were probably not large enough to show this.

DR. J. BALL (*Manchester*) As some of the antibodies produced were of the 7S class, I am surprised that you were not able to demonstrate some influence of rheumatoid factor in your tests. What did you think about that? Also, what was the distribution of rheumatoid factor titre in the gold treated group?

DR. CURREY The results were absolutely clear in showing no influence due to rheumatoid factor. The gold-treated patients were almost all seropositive.

DR. R. N. MAINI (*London*) Soothill and Steward (1971), in experimental work on mice who developed lupus-like nephritis, suggested that the affinity of the antibodies is at fault rather than the total quantity. Have you had a chance to look at that?

DR. CURREY No, we have done this only very crudely up to now.

DR. M. K. JASANI (*Horsham*) I should like to draw the attention of the Society to a possible relationship between your findings and those described by Dr. Esiri and her colleagues in the previous paper. Since, in experimental studies, steroids have been found to suppress more effectively the induction of a primary immunological response than either the established state, that is antibody production, or the secondary immunological response, I wonder whether the abnormality of lymphocyte function in polymyositis might not be incidental, whereas in RA it might not only be central but well established. Maybe some such explanation could help account for the observed fact that in polymyositis a good clinical response can be obtained readily using a high dose of prednisolone and maintained thereafter with a low dose, whereas in RA it is not uncommon to encounter difficulty in maintaining a good response even using a high dose of the steroid.

DR. CURREY Another way of looking at it is that polymyositis is a self-limiting disease and hence ideally treated with steroids, whereas rheumatoid arthritis is not.

DR. JASANI Although I agree that polymyositis is self-limiting, I wonder whether this is because in polymyositis

steroids help to correct the condition through a direct action upon the muscle itself rather than through suppression of the lymphocyte function.

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Rosette-forming Cells in the Peripheral Blood of Patients with Rheumatoid Arthritis. By H. KEITH and H. L. F. CURREY (*The London Hospital Medical College*)

This paper is published in full with the discussion on p. 202 of this issue.

Excision of the lower end of the ulna in rheumatoid arthritis. By N. A. RANA and A. R. TAYLOR (*Oxford Regional Rheumatic Diseases Research Centre, Stoke Mandeville Hospital*)

Removal of the lower end of the ulna was first carried out in 1880 and later recommended for traumatic disorganization of the inferior radioulnar joint. More recently it has been used in rheumatoid arthritis for the destroyed inferior radioulnar and wrist joints.

This paper presents the result of 86 operations followed up for 1 to 8 years, all for rheumatoid arthritis.

The indication for operation were pain, limited rotation of the forearm, and attrition rupture of the extensor tendons. The following results were observed: 94 per cent obtained relief of pain; 87.5 per cent regained full pronation-supination. The return of supination is particularly important for many daily activities, more especially when the elbows and shoulders have limited function.

There was improved power grip in 91 per cent.

Nine patients had concomitant repair of the extensor tendons.

The outcome of operation was also correlated with the radiographic changes in the wrist before operation and at follow-up. Although 94 per cent showed radiographic deterioration, the clinical result remained good.

It is concluded that simple excision of the lower end of the ulna will relieve pain and increase function of the hand in some 90 per cent of patients. It is suggested that this simple procedure can be carried out with success even in the presence of a destroyed wrist joint, and that the operation of arthrodesis of the wrist is rarely necessary.

Discussion

DR. B. ANSELL (*Taplow*) Firstly, have you had any ruptured tendons after operation? Secondly, were there any cases in which there has subsequently been complete dissolution of the carpus? We have had two patients who have been left with gross ulnar drift at the wrist.

MR. TAYLOR No; I think we are probably fortunate, but we have not had any occurrence of tendon rupture following repair, nor have we had any ruptures following excision of the lower end of the ulnar for pain. We have

had an increase of carpal shift, but none in which the carpal bones have completely dissolved.

PROF. J. J. R. DUTHIE (*Edinburgh*) I should like to confirm the excellent results of this operation in Edinburgh. There is one question I want to ask—How often do you notice fusion between the lower end of the radius and the scaphoid?

MR. TAYLOR I think this happens quite often. Part of the operation for fusion of the wrist is to remove the lower end of the ulna, and I think that in the majority it may be this that gives the beneficial results. The wrist is usually pretty stiff when you start.

DR. A. G. S. HILL (*Stoke Mandeville*) There is another sign which could be called the 'falling change' sign. If you are short of full supination and are given a handful of cash after a purchase, you cannot hold it unless you can supinate fully and this is something that this operation restores. The other point, as was shown by Dr. Hilary Hill to this Society last year, is that the number of these operations rises progressively with a reciprocal fall in the number of wrist fusions. The reason is that pain can be relieved even when there is destruction of the carpus, which in earlier years would have led us to think of fusion.

MR. TAYLOR We often forget completely about this absence of supination. Many patients come back afterwards and say they can now collect their change which is a relatively important thing to us all, even to Professor Duthie!

DR. K. LLOYD-JONES (*Mansfield*) Do you routinely transpose the extensor retinaculum deep to the extensor tendons?

MR. TAYLOR No.

DR. K. LLOYD-JONES Have you any experience with this operation in patients in whom the head of the radius has previously been removed or *vice versa*?

MR. TAYLOR Yes; we now have ten patients who have had excision of the lower end of the ulna and the upper end of the radius in the same limb. This has led to no mechanical troubles and we have performed the operations at the same sitting.

Depression of Bone Marrow and Thrombocytopenia associated with Chrysotherapy. By A. KAY (*St. Mary Abbots Hospital*)

Recent reports of deaths associated with chrysotherapy (*British Medical Journal*, 1971) cause some concern. The records of 55 patients who have shown definite evidence of marrow depression or thrombocytopenia, have been collected; 15 of these patients died. The patients were derived from two sources: 42 from Rheumatology Units in response to personal requests and 13 reported to the Committee on Safety of Medicine. The mean total dose of sodium aurothiomalate (Myocrisin) was 698 mg. (range 40-2,050 mg.). After test-dosing the usual loading dose of sodium aurothiomalate was 50 mg./week continued to a total of at least 500 mg. in 23 patients and to 1 g. or more in five others. There was a small group of ten patients who, without warning, developed blood dyscrasias at a total