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Serum C-reactive protein measurement in the detection of intercurrent infection in Oriental patients with systemic lupus erythematosus

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SUMMARY In a prospective study serum C-reactive protein (CRP) concentrations were measured during 28 febrile episodes in 27 Oriental patients with systemic lupus erythematosus (SLE). Although active SLE was associated with only a modest rise in serum CRP level, intercurrent infection provoked substantially higher levels. Serum CRP thus provides a sensitive objective test for this complication in SLE patients of all ethnic groups.

Intercurrent infection, with fever, is a common complication, in patients with systemic lupus erythematosus, both of the disease itself and of the drugs used in its treatment. In addition fever is a frequent symptom of disease activity in SLE, both at the time of initial diagnosis and during subsequent exacerbations of disease.[1 2] The distinction between infection and disease activity as the cause of fever is often difficult but clearly of great importance in the management of the SLE patient.

Unlike most inflammatory and tissue-damaging disorders active SLE in Caucasians is usually associated with only a modest rise in the serum concentration of CRP, the classical acute phase protein, though these patients may show a more pronounced CRP response after infection or trauma.[3–6] Although there has been some controversy,[7] we have previously reported that serum CRP measurement provides a quick, objective test for detecting intercurrent infection in patients with SLE.[8] In a prospective study of 124 Caucasian patients with SLE a serum CRP level greater than 60 mg/l in a febrile patient strongly suggested the presence of infection, while a CRP level below 30 mg/l in an ill patient excluded serious, systemic infection.[8]

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The mechanism or mechanisms for the poor CRP response in SLE are not known. One possibility is that the disease process of SLE may not itself stimulate production of CRP, though this seems unlikely in view of the extensive inflammation and tissue destruction seen in this disorder. Alternatively SLE patients may be genetically 'low CRP responders', at least to their own disease process. Some support for this hypothesis is found in a mouse model of spontaneous autoimmune disease, the $(NZB \times NZW)F_1$ strain, which develops a chronic inflammatory disease resembling human SLE. These mice completely fail to mount any acute phase response during evolution of their pathology but respond normally to other, intercurrent acute phase stimuli.[9]

The possibility that production of human CRP in response to some stimuli may also be under genetic control prompted us to study the CRP response in a group of Oriental SLE patients, in order to compare their behaviour with that of their Caucasian counterparts. We report here that in a series of 27 Oriental patients there was only a modest CRP response to active SLE, and that intercurrent infection provoked the same major CRP response that we have previously reported in infected Caucasian patients with SLE.

Patients and methods

Between July 1982 and November 1983 serum CRP

concentrations were measured by electroimmunoassay during 28 febrile episodes in 27 patients with SLE (25 female, 2 male; mean age 25 years, range 11–44). There were 19 Chinese patients, three Malaysian, three Indian, and two Phillipino patients. All had features of SLE which satisfied the American Rheumatism Association (ARA) criteria for the classification of the disease.[10] The disease activity when the blood sample was taken was assessed by criteria similar to those reported previously,[8] and each patient was assigned to active lupus or infection groups. Infection was diagnosed only on the basis of a positive culture, except where the clinical picture strongly suggested the presence of infection, and where the clinical context was one in which positive cultures are frequently difficult to obtain.

Results

During the study there were 19 febrile episodes due to active SLE and nine due to infection. The individual serum CRP concentrations in each of these two groups are shown in Fig. 1. The difference was clearly apparent (Wilcoxon rank sum test, $p<0{\cdot}01$), with no overlap between the serum CRP concentrations. The results in Oriental SLE patients were very similar to those found in Caucasians. Active SLE was associated with only a modest rise in serum CRP level, the highest level seen being 46 mg/l, and in some cases there was no increase at all. In contrast intercurrent infection provoked substantially higher levels of serum CRP and thus provided a sensitive objective test for this potentially serious complication in all ethnic groups.

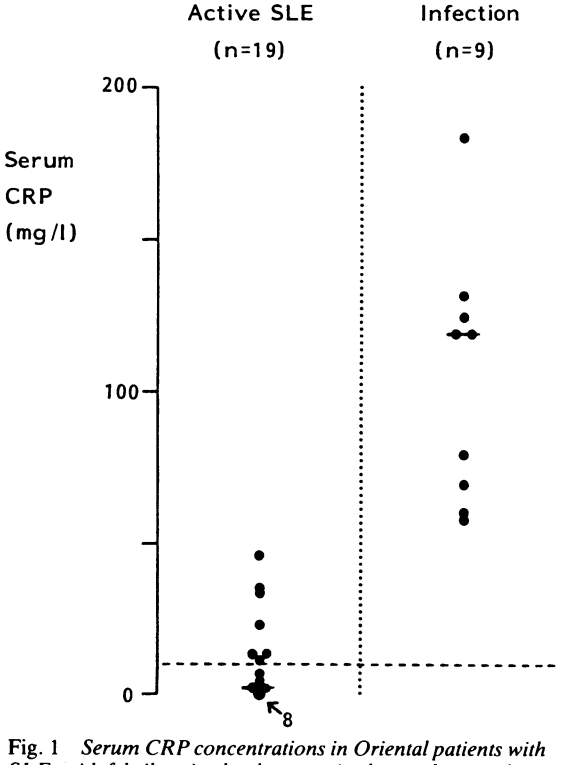

Fig. 1 *Serum CRP concentrations in Oriental patients with SLE, with febrile episodes due to active lupus alone or due to intercurrent infection. Horizontal bars indicate the medians for each group. 90% of normal healthy individuals have a serum CRP concentration below 3 mg/l and 99% below 10 mg/l (interrupted lines).*

Discussion

The present observations support the view that the failure of individuals with SLE to mount a major acute phase response to their own disease, while retaining their capacity to respond to extrinsic stimuli, is an integral part of the condition. It remains to be determined whether this 'low responder' status is genetically determined and therefore potentially primary or of other pathogentic significance.

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