C-reactive protein (CRP) levels in systemic lupus erythematosus (SLE)

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SUMMARY

CRP levels in 194 serum samples from 43 SLE patients were measured. Patients with inactive disease have levels below 10 µg/ml; patients with active SLE have higher levels, but never over 50 µg/ml. In the presence of infection or inflammatory processes, regardless of the activity of SLE, the levels are significantly higher (p < 0.05), and well over 50 µg/ml. Both active SLE patients and inactive SLE patients with local infections have levels between 10 µg/ml and 50 µg/ml. In this situation, the presence of anti-DNA antibodies strongly suggests disease activity (82% versus 9%, p < 0.05). The clinical and physiopathological meaning of these findings is discussed.

Key words: C-Reactive Protein, SLE.

INTRODUCTION

C-reactive protein (CRP) is one of the acute phase reactants (3,10). Its plasma levels increase as a non-specific response to inflammatory processes, tissue necrosis and neoplasia (1-3). Measurements of CRP levels are considered as a good index of inflammatory or disease activity (1-3). Recently, it has been shown that in systemic lupus erythematosus (SLE), dermatomyositis, scleroderma and ulcerative colitis, the levels of CRP do not parallel the disease activity and, in general, are close to normal (4,5). This determination could help to differentiate ulcerative colitis from Crohn’s disease and SLE from rheumatoid arthritis (1). Nevertheless, elevated levels of CRP could be detected in patients with SLE and intercurrent infection (5-8).

Reports on the value of CRP levels in SLE do not specifically assess situations different from activity and infection. Non-infective inflammatory processes (thrombophlebitis) (9), tissue necrosis (myocardial infarction, bowel infarction) (10,11) and neoplasia (12) may occur during the course of SLE. Information on such situations will be important in the management of patients and in the understanding of the kinetics of CRP production.

MATERIAL AND METHODS

One hundred ninety-four randomly selected serum samples from patients diagnosed for SLE according to ARA criteria (13) were studied. Samples had been obtained either during routine follow-up or revision for activity or otherwise from our lupus clinic patients, over the last 5 years and kept at...
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-40°C. Twenty-five blood donors and 23 patients with inflammatory or infectious disease serum samples were used as controls. Inflammatory processes included gout, rheumatoid arthritis and chronic hepatitis.

The patients' charts on the date when serum samples were drawn were reviewed. The presence or absence of activity was defined by using a slightly modified protocol described previously (14). This protocol assigns a score to the different clinical and serological parameters. A total score of over 10 was arbitrarily taken as indicative of activity. Bacterial infection was diagnosed when there was a positive culture or radiological evidence accompanying a compatible clinical picture.

CRP levels were measured by radial immunodiffusion in agarose with monospecific anti-CRP antiserum and commercial CRP (both from ATAB antibodies, Scarborough, Me USA) as the standard. The coefficient of variations of this technique in intra and inter assays was less than 10%, and the lower limit of sensitivity was 3'5 μg/ml. Non-parametric tests were used for the analysis of the difference between values (Mann-Whitney). Fisher's exact test was used for the comparison of incidences.

Table I: CRP levels in 50 controls. Nineteen samples were from patients with inflammatory processes and 6 from patients with infections.

<table>
<thead>
<tr>
<th></th>
<th>Median (μg/ml)</th>
<th>Range (μg/ml)</th>
</tr>
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<tbody>
<tr>
<td>Normal</td>
<td>25 0</td>
<td>0-8</td>
</tr>
<tr>
<td>Inflammation</td>
<td>19 72</td>
<td>7.3-638</td>
</tr>
<tr>
<td>Infection</td>
<td>6 61</td>
<td>7.3-444</td>
</tr>
</tbody>
</table>

Table II: CRP levels in 23 samples from SLE patients with active disease. Eight of them were drawn in coincidence with infection or inflammatory processes.

<table>
<thead>
<tr>
<th></th>
<th>Median (μg/ml)</th>
<th>Range (μg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>23 9.3</td>
<td>0-50</td>
</tr>
<tr>
<td>...and infection</td>
<td>4 13.8</td>
<td>0-74</td>
</tr>
<tr>
<td>...and inflammation</td>
<td>4 89.1</td>
<td>71-151</td>
</tr>
</tbody>
</table>

RESULTS

CRP levels were under 10 μg/ml in the 25 controls, and only in two over 5 μg/ml. In patients with infections and non-infectious inflammatory processes the mean values were 166 ± 92 μg/ml and 138 ± 122 μg/ml (Table I).

The 194 samples belonged to 43 patients. Twenty-three were drawn during activity of the disease and their CRP values never exceeded 50 μg/ml. Eight were obtained during activity, but in coincidence with infection (4) or inflammation (4). These CRP values were higher and, frequently, over 50 μg/ml (Table II).

Twenty-one samples were from patients with infection but without activity. Nineteen of these 21 were obtained in coincidence with positive blood or urine cultures. The highest CRP levels were those in patients with positive blood cultures (median 280 μg/ml) (Table II). There was a significant difference in CRP levels between patients with systemic infection and patients with disease activity (p <0.01). In patients with positive urine culture and without systemic symptoms the levels never exceeded 40 μg/ml (Table III).

CRP levels between 10 μg/ml and 50 μg/ml were found in patients with activity or local infections (Fig. 1). In these situations the presence of anti-DNA antibodies strongly suggests the former (82% versus 9%, p <0.05). One hundred and forty-two samples belonged to clinically asymptomatic patients without infections. The median value for those was 8.1 μg/ml (Table III). Seven samples had a CRP value over 50 μg/ml and all were from patients with a past or present history of inflammatory or neoplastic disease (Table IV).

DISCUSSION

Initial reports using semiquantitative techniques showed a lack of elevation of CRP levels during activity in SLE (15). Horning et