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Short Communication

Acute-Phase Proteins in Patients with Systemic Sclerosis

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Abstract: Acute-phase proteins were determined in serum of 20 women with systemic sclerosis and 10 age-matched healthy controls. All the patients had had symptoms of the disease less than five years. An increase in only a few proteins (haptoglobin, α_1-acid glycoprotein, complement component C3 and α_2-macroglobulin) was found. The results indicate for the impaired acute phase response in patients with systemic sclerosis.

Keywords: α_2-macroglobulin; Acute-phase proteins; Haptoglobin; Systemic sclerosis

Introduction

Systemic sclerosis (SSc) is a disease characterised by generalised fibrosis. It is believed that fibrosis is the final stage of an altered interaction between three systems involved in the poorly understood pathogenesis of the disease: the vascular system, the immune system and connective tissue activation. These phenomena at least partially are associated with inflammation.

The present study was designed to evaluate the level of acute-phase proteins in the serum of patients with SSc. Acute-phase proteins have been defined as those whose plasma concentration increases (by at least 25%) following several stimuli, including infection, trauma and immune-mediated inflammatory states. Acute-phase proteins are classified into three groups. The first group consists of proteins that increase by about 50% (ceruloplasmin, complement components C3, C4), the second group includes proteins that increase two to four times (α_1-antitrypsin, α_1-acid glycoprotein, haptoglobin) and the third group comprises proteins that increase up to 1000 times (C-reactive protein). Additionally, some proteins are known as 'negative' acute-phase proteins because their level decreases in response to stimuli that cause an enhanced level of the above-mentioned proteins [1].

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Materials and Methods

Twenty women, aged 23–52 years (mean 37.5 years) with definite SSc were investigated. All had had symptoms of the disease for less than 5 years. Patients with other disorders known to affect acute-phase proteins were excluded from the study. Ten healthy, age-matched women were investigated as the controls.

Venous blood samples were taken after overnight fasting and the serum was separated. All investigated subjects had been without any medication for at least 3 weeks before the blood sampling. Serum proteins were measured with the kinetic nephelometric method using the ICS Analyzer II (Beckman, USA) and reagents were obtained from the same company.

Results and Discussion

Results are summarised in Table 1. Only a few acute-phase proteins were shown to be increased in the patients with SSc. They included haptoglobin, α_1-acid glycoprotein and complement component C3. There was no change in the level of C-reactive protein. However, α_2-macroglobulin, which is not considered to be an acute-phase protein in humans (as it is in rats), was enhanced in the SSc patients. Additionally, it should be mentioned that the elevated levels of α_1-acid glycoprotein,

Table 1. Levels of acute-phase proteins (mg/dl) in patients with systemic sclerosis and in healthy subjects

Acute-phase protein	Systemic sclerosis	Healthy controls
Complement component C3	134.8 ± 27.5	96.9 ± 22.4*
Complement component C4	24.4 ± 5.6	22.7 ± 6.3
Ceruloplasmin	37.2 ± 7.9	36.6 ± 10.2
α_1-antitrypsin	154.4 ± 34.5	154.9 ± 26.4
α_1-acid glycoprotein	69.4 ± 22.8	51.9 ± 8.5*
Haptoglobin	138.7 ± 65.4	86.5 ± 31.8*
C-reactive protein	0.62 ± 0.11	0.57 ± 0.08
α_2-macroglobulin	197.0 ± 41.0	147.9 ± 21.6*
Transferrin	253.7 ± 46.0	242.0 ± 39.7
Prealbumin	18.2 ± 6.8	21.8 ± 4.4
Albumin	3794 ± 732	3938 ± 278

*Difference statistically significant ($p<0.05$).
Data expressed as mean ± SD.

haptoglobin and $\alpha_2$macroglobulin are probably responsible for the increased relative content of α_1- and α_2-globulin in the serum of the patients, as detected with a routine electrophoretic method.

The only study on acute-phase proteins in patients with SSc was published by Marra et al. [2]. They investigated a few inflammatory and coagulative indices, and their results are only partially concomitant with our findings. Marra et al. [2] showed no difference between SSc patients and controls in the levels of complement component C3, α_1-antitrypsin and α_2-macroglobulin. Other acute-phase proteins were not investigated by these authors. In our study, an increase in the levels of α_2-macroglobulin and complement component C3 was found. The nature of the differences in these results is unknown. The only possible explanation is a lack of data on the duration of the symptoms of the disease in the patients investigated by Marra et al. [2]. It is possible that in advanced disease additional factors (e.g. secondary infection) may affect the acute-phase response. On the other hand, the conclusion of Marra et al. [2] that only some inflammatory indices are enhanced in patients with SSc is similar to our findings. Lack of an abnormal level of α_1-antitrypsin has also been reported by Seibold et al. [3].

It is believed that inflammatory phenomena are seen only in the early states of SSc or that they result from secondary complications (e.g. infection) in the patients. The relative lack of signs of inflammation is one of the significant differences between SSc and other so-called collagen diseases.

Our results indicate an impaired acute-phase response in patients with SSc. The mechanism of this phenomenon remains unclear and may be related to altered secretion of the cytokines that are responsible for mediation of the acute-phase response [4].

References

1. Volanakis JE. Acute-phase proteins in rheumatic diseases. In: Koopman WJ, editor. Arthritis and allied conditions, vol 1. Baltimore: Williams and Wilkins, 1997:505–14.
2. Marra R, Pagano L, Storti S, Paoletti S, Garcovich A, Bizzi B. Evaluation of some inflammatory, coagulative and immune parameters in progressive systemic sclerosis. Acta Med Pol 1988;29:81–8.
3. Seibold JR, Iammarino RM, Rodman GP. Alpha-1-antitrypsin in progressive systemic sclerosis. Arthritis Rheum 1980;23:367–70.
4. Fagundus DM, LeRoy EC. Cytokines and systemic sclerosis. Clin Dermatol 1994;12:407–17.

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