Canad. Med. Ass. J.
Oct. 7, 1967, vol. 97

Quebec Beer-Drinkers' Cardiomyopathy: Immunochemical Studies

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SERA obtained from 16 patients suffering from Quebec beer-drinkers' cardiomyopathy were examined by means of cellulose acetate electrophoresis and analytical ultracentrifugation. In addition, the concentration of the three classes of immunoglobulins and of the C'3 component of complement were determined. Finally, to detect specific proteins whose presence might reflect the occurrence of tissue damage or a particular type of antigenic stimulation, the sera were analyzed for C-reactive protein, rheumatoid factor and anti-nuclear antibodies.

METHODS

A Beckman Microzone cell was employed for cellulose acetate electrophoresis. Ultracentrifugal analysis was performed on a Beckman Model E analytical ultracentrifuge. Immunoglobulin and C'3 quantitation were obtained employing Hyland immunoplates. The presence of rheumatoid factor, antinuclear antibodies and C-reactive protein was determined by means of slide agglutination.

RESULTS

The results obtained from cellulose acetate electrophoresis, the quantitation of the three immunoglobulins and the C'3 component of complement are recorded in Table I.

C-reactive protein was present, while rheumatoid factor and antinuclear antibodies were uniformly absent, in all sera examined.

Study of the sera in the analytical ultracentrifuge failed to reveal any abnormality in the serum proteins.

DISCUSSION

The most significant feature revealed by this study was the presence of the serum protein changes that developed as a consequence of inflammation and tissue necrosis induced by an acute or chronic injury. These changes, listed in Table II, are entirely non-specific and cannot be implicated in the pathogenesis of any

TABLE I.—SUMMARY OF THE ELECTROPHORETIC AND IMMUNOCHEMICAL ANALYSIS OF THE SERUM PROTEINS

Patient No.	*Albumin*	*Alpha-2 globulin*	*Beta globulin*	*IgG**	*IgA***	*IgM†*	*Cl 3‡*
B-8	4.80	.58	.90	*1940*	*1350*	*380*	120
E-6	4.38	.31	.61	*1825*	*900*	*285*	115
A-5 (Jan.)	3.59	*1.22*	*1.22*	*1864*	*280*	54	—
A-5 (April)	4.36	.31	.38	*1570*	*900*	*200*	135
A-7	4.41	*.96*	1.05	*1500*	*540*	*325*	*190*
E-7	4.67	.23	.70	*1610*	*390*	*140*	*175*
C-2	4.51	.61	*1.29*	*1690*	*440*	*150*	*190*
A-3	4.51	.81	*1.17*	*1660*	260	80	*215*
A-6	3.81	.62	*1.11*	*1600*	*450*	56	135
A-1	3.66	*1.02*	.75	*1430*	*460*	100	150
E-3	5.42	.61	.84	*1675*	240	*285*	115
E-9	4.79	*.97*	.67	1370	*660*	*340*	135
X	*2.25*	.64	.32	1260	*750*	*140*	103
A-2 (Dec.)	4.32	.61	.68	1280	130	*130*	125
A-2 (April)	5.52	.52	.59	600	*320*	*160*	*190*
A-4	5.30	.73	.73	1004	*350*	76	*170*
B-6	4.47	.73	.85	850	*770*	100	—
A-8	5.58	.68	.48	600	*340*	*150*	*180*

*Normal IgG - 1158 ± 305 mg./100 ml.
**Normal IgA - 200 ± 61 mg./100 ml.
†Normal IgM - 100 ± 27 mg./100 ml.
‡123 - 167 mg./100 ml.

TABLE II.—CHANGES IN THE SERUM PROTEINS IN RESPONSE TO TISSUE INJURY

I. PRIMARY INFLAMMATORY REACTION (occurring at the same time as the inflammatory reaction):
The presence of C-reactive protein
Elevation of alpha globulins
Decreased albumin
Elevation of serum complement

II. SECONDARY REACTION TO INJURY (occurring after a latent period of 7 to 10 days), characterized by:
Increased concentration of gamma globulin.

These serum protein changes may occur in the presence of any tissue injury, acute or chronic, due to whatever cause.

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single disease process.[1] They have variously been designated as the *acute phase reaction*[2] or the *primary inflammatory serum protein reaction.*[1] The latter term will be used to describe the phenomena, as it does not tend to suggest the duration of a disease process.

In our study, the most consistent feature of the primary inflammatory reaction was the presence of C reactive protein in all specimens tested. The other components of the reaction were detected in a smaller percentage of samples. Serum complement levels were elevated in approximately 37% of cases and the $alpha_2$ globulin fraction was increased in 22% of the material examined. Despite the generally poor nutrition of these patients, their serum albumin levels were normal in all but one instance.

The increase in serum immunoglobulins following acute or chronic tissue injury has been designated by Odenthal as the *secondary inflammatory serum protein reaction.*[1] These non-specific changes are listed in Table II. The level of serum immunoglobulins is normally determined by the rate of antibody synthesis, which in turn is dependent upon the frequency, intensity and duration of antigenic stimulation.[3] It would appear therefore that these patients had been exposed to a sufficiently intense antigenic challenge to increase their serum immunoglobulins above the normal value observed in the general population. However, nothing can be said as to the nature of this antigenic stimulation.

Summary Sera obtained from 16 patients with Quebec beer-drinkers' cardiomyopathy were studied for changes in the normal pattern of serum proteins. The presence of components of the primary and secondary inflammatory serum protein reaction was detected in all sera. These changes are non-specific and cannot be implicated in the pathogenesis of any single disease process.

Résumé L'auteur, après avoir étudié les modifications de l'aspect normal des protéines dans le sérum obtenu de 16 buveurs de bière du Québec, souffrant de cardiomyopathie, a décelé, dans tous les spécimens, la présence d'une réaction inflammatoire, primaire et secondaire, dans les protéines du sérum.

Ces changements sont cependant non spécifiques et ne peuvent être incriminés comme éléments pathogéniques d'une seule entité morbide.

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