

QUANTITATIVE CHANGES IN SOME SERUM PROTEINS IN VIRAL HEPATITIS

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Using routine methods it is difficult to differentiate changes in some of the serum proteins. A number of serum protein factors hardly lend themselves to detection through electrophoresis or common chemical techniques because of their weak electrophoretic activity. Nowadays, their demonstration has been rendered possible as the result of obtaining monospecific antisera and application of the latter in immunodiffusion and radioimmune tests (3, 4, 11). Serum protein changes in viral hepatitis (VH) have been studied by many authors (5, 6, 7). The proteins representing a particular interest mainly because of the close relationship of some of them to humoral immunity, include: serum immunoglobulins, as well as ceruloplasmin, transferrin, α_2 -macroglobulin, complement C 3 (β_1C/β_1A)-globulin etc.

Hence we made it our aim to trace the changes in serum level of some of the listed above proteins in VH patients during the icteric period of the affection.

Material and method

The present report covers 138 VH patients with various clinical forms, admitted and treated in the clinic of infectious diseases — Varna, over the period 1974—1975. Their age ranges from 15—76 years, average 30.7 years; 82 men (59.42 per cent) and 56 women (40.1 per cent). They are distributed according to clinical form as follows: slight form — 115 (83.34 per cent), medium heavy — 14 (10.15 per cent), heavy — 7 (5.07 per cent), and dystrophic, with hepatal coma and lethal outcome — 2 (1.44 per cent).

Determination of the serum proteins was made through radial immunodiffusion, according to Mancini (8), using monospecific antisera obtained from the Center of Infectious and Parasitic Disease (Sofia) and Boehringerwerke (Federal Republic Germany). Quantitative determinations were performed of the following serum proteins: immunoglobulins IgG, IgM and IgA, IgE, transferrin, α_2 -macroglobulin and complement C 3 (β_1C/β_1A -globulin). In all patients with VH studies were carried out of the usual hepatic flocculation and ferment tests, serum bilirubin, blood picture with differential count, erythrocyte sedimentation rate, and complete investigation of the urine. The hepatitis-associated (Australia) antigen was also studied through electrophoretic immunoprecipitation (10). As controls we used the values of sera from 28 healthy individuals — blood donors.

Results and discussion

The results of the study of the above listed serum proteins in VH patients are presented in Table 1.

Table 1

Mean Values of Some Serum Proteins in Viral Hepatitis

Groups of patients	Indicators	No	Serum proteins							
			Immunoglobulins				Alpha ₂ macro globul.	Transferrin	C ₃ (B ₁ A)	
			IgG	IgM	IgA	IgE				
			mgG/100 ml	/mg %			mg/100 ml	mg %		
Viral hepatitis		134	\bar{x}	2295.95	118.85	324.08	356.77	307.31	268.44	103.57
			σ	755.40	71.77	110.37	107.70	110.37	97.22	31.36
			m_x	61.07	5.80	8.92	13.26	7.86	10.71	6.85
Hepatitis associated (Australia) antigen	(+) 63		\bar{x}	2530.91	88.41	320.00	313.52	274.55	324.77	—
			σ	690.47	51.55	100.12	85.35	86.74	75.74	—
			m_x	104.14	7.77	15.10	13.08	12.87	11.42	—
	(—) 75		\bar{x}	2331.11	124.72	375.67	308.19	224.58	251.39	—
			σ	603.96	76.57	126.99	98.91	81.26	73.72	—
			m_x	100.66	12.83	21.10	16.49	13.54	12.29	—
Controls		28	\bar{x}	1200.11	80.02	238.22	124.00	250.44	280.00	89.21
			σ	319.00	29.14	121.01	31.01	96.67	55.67	18.41
			m_x	60.27	15.11	22.86	5.85	13.27	17.57	3.48

The serum immunoglobulin values were increased in comparison with those in the controls ($p < 0.01$). No essential difference was found in the values of the immunoglobulins between the positive for hepatitis-associated (Australia) antigen patients and those negative for the same antigen. Complement C₃ serum level proved slightly elevated among the VH patients, although the difference, relative to controls, was not statistically reliable ($p < 0.1$). The mean transferrin and alpha₂-macroglobulin values appeared to be higher than the control values ($p > 0.01$).

As already pointed out in earlier works (2), the rise of immunoglobulin in the serum is considered as a non-specific symptom equally in a variety of diseases and in viral hepatitis. However, their changes may be interpreted as an adequate indicator during clinical observations in the course of a given disease with a view to assess the immunoreactive state of the organism, and in the differential diagnostic discussion. In this respect, immunoglobulins are of particular importance in hepato-biliary affections too (9).

It is of interest to note the changes in fifth-class immunoglobulins, IgE, whose increase points to the presence of an allergic component in the pathogenesis and clinical course of VH. Not infrequently, the latter runs a heavy course with pronounced specific allergic-reaction manifestations, assuming the form of hyperergic inflammation (1). This is particularly clearcut in the dystro-

phic VH forms where, probably, autoimmune processes also develop. In the latter instances IgE determination proves very helpful since from its level in the serum it is possible to judge for the allergization degree. The other two serum proteins — transferrin and alpha₂-macroglobulin — disclosed statistically reliable changes: considerably increased values among VH patients. According to literature reports, alpha₂ — macroglobulin is elevated in a variety of hepatic lesions, nephrosis and diabetes, while transferrin — in nephrosis and malignant neoplasms (7, 9). In our studies transferrin (siderophilin) exhibited a certain degree of increase, although less pronounced than the increase in serum immunoglobulins and alpha₂-macroglobulin ($p < 0.05$). No changes worthy of notice were established in the complement C 3 level.

In conclusion, it may be stated that determination of the quantitative values of serum immunoglobulins (IgG, IgM, IgA and IgE), alpha₂-macroglobulin, transferrin and complement C 3 in patients with acute VH could afford to the clinician valuable information about the intra- and extrahepatal mesenchymal reactions of the organism, as well as about its immune state, both of which are important factors in the clinical course and prognosis of the disease.

Conclusions

1. The serum immunoglobulins IgG, IgG, IgM and IgE show substantially elevated values in a series of 138 patients with acute viral hepatitis, studied during the icteric period.
2. An increase is also recorded in the serum level of alpha₂-macroglobulin and transferrin.
3. The serum level of complement C 3 (β_1C/β_1A -globulin) did not show statistically reliable difference in comparison with controls.

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**КОЛИЧЕСТВЕННЫЕ ИЗМЕНЕНИЯ НЕКОТОРЫХ СЫВОРОТОЧНЫХ
ПРОТЕИНОВ ПРИ ВИРУСНОМ ГЕПАТИТЕ***М. Радков***Р Е З Ю М Е**

Исследованы 138 больных с острым вирусным гепатитом, леченных в клинике инфекционных заболеваний (г. Варна) в 1974—1975 гг., у которых проведено количественное определение ряда сывороточных протеинов: иммуноглобулины (IgG, IgM и IgA), α_2 — макроглобулины, трансферрин и компонент C_3 (β_1C/β_1A -глобулин). Определение проведено методом радиальной иммунодиффузии по Mancini. Установлено значительное повышение уровня сывороточных иммуноглобулинов трех классов, трансферрина и α_2 — макроглобулина. Между положительными на гепатит-ассоциированный антиген больными с вирусным гепатитом и отрицательными на тот же самый антиген больными не установлена значимая разница в отношении исследуемых сывороточных протеинов.