



Original Contribution

**CHANGES IN IMMUNOGLOBULINS DURING INFECTIONS OF
CENTRAL NERVOUS SYSTEM**

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ABSTRACT

The changes in the liquor and serum levels of the three main classes of immunoglobulins in infections of central nervous system (CNS) have an important place in the panel of diagnostic indicators. Purpose of the present work is to compare levels of immunoglobulins in bacterial (BM) and viral (VM) meningitis. This study has been analyzed the serum levels and the liquor levels of the three main classes of immunoglobulins in bacterial and viral infections of the CNS within five years. Unlike the serum levels, the liquor levels of IgG, IgA and IgM have been shown significantly higher values in BM and have serious diagnostic importance in cases with infections of the CNS.

Key words: central nervous system, bacterial meningitis, viral meningitis, immunoglobulins

The infections of the central nervous system are very common throughout the world. The most important factors for the diagnosis are clinical, epidemiological, routine laboratory and immunological investigations and parameters in cerebrospinal fluid (CSF). One of the methods with serious diagnostic significance is the examination of serum and liquor levels of three classes' immunoglobulins - IgA, IgM, and IgG. From five main classes of immunoglobulins (IgG, IgM, IgA, IgD and IgE) only two normally have been presented in the liquor - IgG and IgA [1,2]. The data about IgM have been controversial; however it can be detected in highly concentrated liquors [1]. During acute inflammatory diseases of the CNS, the permeability of the BEB has been increased, which leads to different increasing in the levels of Ig with the biggest rise in the level of IgA [quoted in 2]. The higher liquor levels of IgG, IgA and IgM are much more marked in cases of BM than VM. These indicators can be reliable diagnostic criteria when interpreted together with the results of other examinations.

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PURPOSE

Study of the changes in the values of serum and CSF levels of Ig in bacterial and viral meningitis and meningoencephalitis.

MATERIAL AND METHODS

Serum levels of ninety two patients and CSF levels of 36 patients of the three main classes of immunoglobulins with bacterial and viral infections of the CNS for a period of 5 years have been investigated. The control group has been consisted of 56 healthy individuals. The method of Mancini's G. et al. radial immunodiffusion has been used (1967).

RESULTS

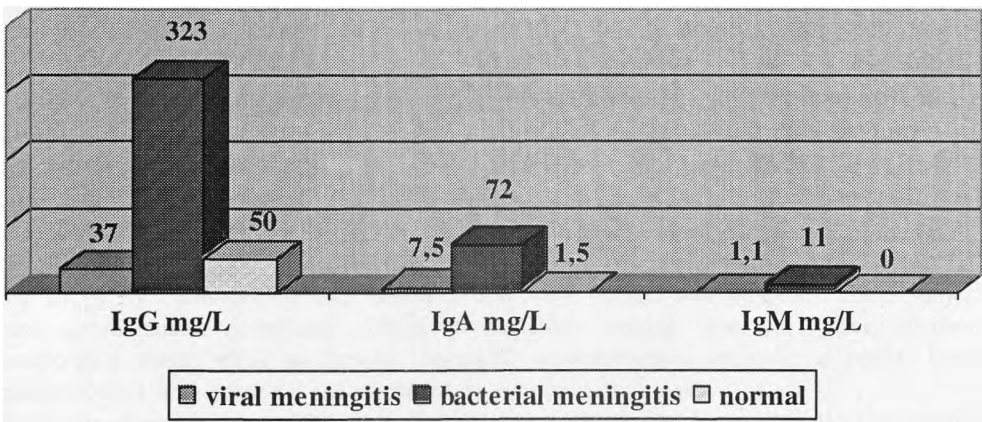
**Changes in immunoglobulins in
bacterial infections of CNS**

Serum levels of the three main classes of Ig in adult patients with BM have been investigated. Lower average values of IgG have been detected in 25,00% of cases. Serum levels of IgG have been fluctuated from x 926 to x 1524 mg/L with an average value for the studied period of 1263 mg/L. Serum levels of IgA has been below normal in 20% of the studied patients. The

average values of IgA have been varied from $\bar{x}$ 111 to $\bar{x}$ 330 mg/L, with an average for the studied period of $\bar{x}$ 233 mg $\pm$ 25 mg/L. The serum levels of IgM have been with lower average values in 64% of the cases from $\bar{x}$ 146 to 227 mg/L ($\bar{x}$ 186 mg/L). CSF levels of IgG have been shown many times higher values - $\bar{x}$ 323,90 $\pm$ 23,20 mg/l (N 50 mg/L $\pm$ 5 mg/L), which is due to the low molecule weight of IgG or because of its synthesis in the liquor spaces.

CSF levels of IgA have been shown higher average values ($\bar{x}$ 72,41 mg/L $\pm$ 28,72 mg/L), with normal levels of 1 mg/L (1 - 5 mg/L) - the inflammatory changes increase the permeability of blood-brain barrier which has been facilitated increasing of CSF level of IgA independent of its bigger molecule weight. IgM, which normally has been absent in the liquor spaces, has been with increased values to 11,25 mg $\pm$ 3,32 mg/L in cases of BM (Figure 1).

Figure 1. Immunoglobulins in CSF



Changes in immunoglobulins in viral infections of CNS

In VM serum levels of IgG have been normal in 40% of cases with variability from 1120 mg/L to 1656 mg/L (average 1289 mg/L) but in 60% of patients serum levels of IgG have been increased from 1315 mg/L to 1656 mg/L (average 1485 mg/L). Serum levels of IgA have been moderately increased, normal or decreased (average 229 mg/L; from 178 to 313 mg/L). Serum levels of IgM have been

normal (average 139 mg/L; from 114 to 183 mg/L). The liquor level of IgG is 37 mg/L, with reference 50 mg/L; for IgA the values have been shown a moderate rise 7,5 mg/L, with reference 1 to 5 mg/L; IgM has been measured in average 1,1 mg/L, when it should be absent in normal liquor. These data have been presented in Table 1.

Table 1. Immunoglobulins during infections of CNS

^^^disease indicatoC^^	serum levels			CSF levels		
	BM	VM	normal	BM	VM	normal
IgG mg/L	1263 $\pm$ 489	1485 $\pm$ 417	800-1800	323 $\pm$ 213	37 $\pm$ 12,5	50
IgA mg/L	233 $\pm$ 25	229 $\pm$ 135	40-450	72,41 $\pm$ 49	7,5 $\pm$ 2,8	1,0-5,0
IgM mg/L	186 $\pm$ 90	139 $\pm$ 66	60-250	11,25 $\pm$ 9,32	1,1 $\pm$ 1,09	0

DISCUSSION

The examination of the serum immunoglobulins of the three main classes in the present research did not show statistically

significant differences between BM and VM, and therefore cannot be used as reliable diagnostic criteria. The immunoglobulins in CSF in BM have been shown significantly higher values of IgG and this class can have substantial diagnostic value. IgA and IgM have moderate CSF levels, however still very

much higher than the levels in VM. No correlation has been detected between serum immunoglobulins in the two types of infections of the CNS, but CSF levels have diagnostic value.

CONCLUSION

The liquor levels of IgG, IgA and IgM have been shown substantially high values in BM. These parameters have diagnostic significance and play an important role in the panel of examinations in infections of CNS.

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