

# MAGNESIUM AND SULFUR CONCENTRATIONS IN THE SERUM AND IN THE CEREBROSPINAL FLUID OF SCHIZOPHRENICS PATIENTS

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In order to contribute to the knowledge of the physiopathology of schizophrenia, biochemical studies have been developed. Until now the investigations have been related specially to the abnormalities of plasmatic proteins and to the disorders of aminate metabolism<sup>7</sup>. In relation to chemical elements, studies about copper<sup>8,9</sup> and ceruloplasmin<sup>1,2,8</sup> are referred. The aim of the present work is to study the behavior of magnesium (Mg) in the blood and in the cerebrospinal fluid and of sulfur (S) in the blood of schizophrenic patients.

## MATERIAL AND METHODS

Of a total of 42 schizophrenic patients, 39 came from a private clinic and 3 from the Psychiatric Clinic of the Medical School of the University of São Paulo. All the patients were males, the age varying from 17 to 42 years. The sample included 34 white, 6 mulattoes, one negro and one japanese descendent patient.

In 22 cases blood samples were secured for sulfur determination in the serum. In 26 cases blood samples and in 11 cases cerebrospinal fluid samples were secured for magnesium determination. The material was collected from patients that had been in a fasting condition for at least three hours. Completely clean and dry tubes, syringes and needles were used. The blood samples were centrifuged 3 to 4 hours after collection, determinations being made on the same day, or the serum, after centrifugation, was stored at -10°C.

Magnesium was determined according to the method of yellow titan in alkaline solution, slightly modified<sup>6</sup>. The results were compared with the normal concentrations determined by the same method<sup>3</sup>. Inorganic sulfur analysis were made by the turbidimetric method<sup>5</sup>; normal values have been reported elsewhere<sup>4</sup>.

The results presented here were subjected to conventional statistical analysis.

## R E S U L T S

The results are summarized in table 1. The slight decrease of blood magnesium in schizophrenics is statistically significant. On the other hand, no statistical variations were detected in cerebrospinal fluid magnesium and blood sulfur in schizophrenic patients compared with normals.

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		Mean	± S.d.	Mx	Mn	t	D.f.
Blood Mg	normals (130 cases)	2.078	0.067	2.185	1.916	14.60*	154
	schizophrenics (26 cases)	1.811	0.155	2.432	1.590		
CSF Mg	normals (36 cases)	2.266	0.061	2.360	2.178	1.538	45
	schizophrenics (11 cases)	2.086	0.223	2.432	1.783		
Blood S	normals (40 cases)	1.217	0.193	1.608	0.836	0.661	60
	schizophrenics (22 cases)	1.255	0.255	1.815	0.783		

Table 1 — Magnesium (mg/100 ml) and sulfur (mg/100 ml) concentrations in the blood serum and in the cerebrospinal fluid of schizophrenic patients.

\* Significant value ( $P < 0.001$ ).

#### COMMENTS

Schizophrenia is a serious affection, responsible for about half the number of patients in psychiatric institutions and this certainly justifies any studies relating to this disease.

From the biochemical viewpoint however, only copper and ceruloplasmin have been studied in the blood and in the cerebrospinal fluid. In the present work additional data is presented concerning the behavior of magnesium in blood and in cerebrospinal fluid and of sulfur in the blood of schizophrenic patients.

As can be seen in table 1, no statistical differences were found between the levels of magnesium in the cerebrospinal fluid and of sulfur in the blood when compared with the normal values. Significantly lower levels for magnesium were found, however, in the blood of schizophrenic patients. Hypomagnesiemia has been known to be associated with symptoms of irritation of the central nervous system<sup>5, 10</sup> as well as epilepsy<sup>2</sup>. So far, however, it has not been possible to make any interpretation of this low magnesium values in schizophrenic patients; it is also likely that this finding may not have a diagnostic value.

## SUMMARY

Forty two cases of schizophrenic patients were studied. Magnesium was determined in the blood (26 cases) and in the cerebrospinal fluid (11 cases) and sulfur was determined in the blood (22 cases). By statistical treatment of the data obtained the author came to the following conclusions: 1) the variations in the levels of magnesium in the cerebrospinal fluid and of sulfur in the blood are not significant; 2) the levels of blood magnesium are significantly lower in schizophrenic patients in relation to normal values.

## RESUMO

*Concentrações do magnésio e do enxofre no soro e no líquido cefalorraqueano de pacientes esquizofrênicos*

Foram estudados 42 casos de esquizofrenia. O magnésio foi dosado no sangue (26 casos) e no líquido cefalorraqueano (11 casos) e o enxofre foi dosado no sangue (22 casos). Após análise estatística dos resultados os autores chegaram às seguintes conclusões: 1) as variações dos níveis de magnésio do líquido cefalorraqueano e de enxofre do sangue não são significantes; 2) o nível de magnésio do sangue está significativamente mais baixo nos esquizofrênicos em relação aos normais.

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