Serum Magnesium Concentration in
Schizophrenia and Epilepsy

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Serum magnesium concentration values were determined on groups of normal, schizophrenic, and epileptic patients. The magnesium levels in all the groups were essentially identical and no single value was outside the limits of normal as defined by the mean ± 3 S.D.

A significant elevation in plasma magnesium concentration in a small series of schizophrenic and depressive patients has recently been reported by Cade (1). These levels were said to be further elevated by treatment. The present study, as part of a study of blood from schizophrenic patients (2, 3), was undertaken to determine if these observations represented a general phenomenon among schizophrenic patients. A small group of epileptic patients was also included to provide a test of the suggestion that this group might reflect a contrasting status with regards to magnesium concentration (1).

Materials and Methods

Serum magnesium was measured by a Titan yellow method (4), and is reported as milliequivalents per liter (mEq./L.) of serum. Total serum protein was measured by a modified biuret method (5) on the AutoAnalyzer. All blood samples were collected between 7:30 and 8:30 A.M., allowed to clot at room temperature for 30–45 min., and the serum separated by centrifugation. The separated serums were stored at −20° until assayed—always within 10 days. The schizophrenic patients were selected on the basis of their freedom from known organic disease with special care to eliminate those with renal and liver disease.
diabetes, and alcoholism. All were males. Their ages ranged from 20 to 62 years with 32 (of 52) falling within the range of 35-45 years. The duration of diagnosed mental disease ranged from less than 1 year to 20 years. All, except 2, were on medication, but no single drug was common to all patients.

Results

The results are tabulated in Table 1. The data on magnesium are presented in the form of concentration and as milliequivalents of magnesium per gram (mEq./gm.) of serum protein. There were no significant differences between the three groups by either method of calculation. The ranges of values were essentially identical and no single value in either of the study groups was outside the limits of normal as defined by the mean ± 3 S.D. The values obtained in our control group are in close agreement with the normal values recorded in the literature (6, 7).

Discussion

The findings on serum magnesium concentration in these groups of patients were completely normal. Hence, hypermagnesemia does not seem to be a characteristic or a likely finding in schizophrenia. In view of the fact that Cade (1) reported a significant elevation in 8 of the 15 schizophrenic patients he studied, the possibility should be considered that some selective factor was operating. However, insufficient data are available for evaluation of this possibility. Evaluation of elevated serum magnesium should include the possibility of impaired renal function, since renal retention is the most common cause of elevated magnesium levels (8).

References