

Although words and ideas are mutually dependent, our primary aim is to advocate not so much a new concept as a change in terminology. We are proposing that those patients currently labelled as 'attempted suicides' should receive a less confusing designation. Conundrums on points of theory, however important and intriguing, can afford to wait; clinical needs cannot.

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EFFECTS OF LITHIUM ON PLASMA MAGNESIUM

DEAR SIR,

The recent work of Frizel *et al.* (*Journal*, December 1969, p. 1375) on plasma levels of magnesium and calcium in depression contains some very interesting results which are worthy of some further consideration. Calculation from the published data of the 'non-ionized' fraction of the metals indicates that there is a trend for the mean 'non-ionized' calcium to be higher in the depressed state than in the normal, recovered or lithium treated states. There is also a converse trend for the 'non-ionized' magnesium to be lower in depression than in normal or recovered states. However, after lithium treatment the 'non-ionized' magnesium is decreased by about 50 per cent. This suggests that lithium medication and spontaneous recovery result in opposite changes in 'non-ionized' plasma magnesium.

Some current theories on the mode of action of lithium assume an interaction with sodium. From a chemical point of view, lithium can also be considered to be very closely related to magnesium and calcium, owing to the so called 'Diagonal Relationship'. Lithium is in the typically anomalous position of a first row element in the periodic table. In this position group relationships are weaker, and diagonal affinities with the next group are relatively stronger. This effect is shown in both chemical and physical properties. From the chemical standpoint it could therefore be postulated that the normothymotic effect of lithium (Schou, 1968) is due to an interference with the metabolism or binding of magnesium. The logical corollary is that defects in magnesium metabolism could be involved in the pathophysiology of the manic-depressive syndrome. The central role of magnesium in energy-producing enzyme reactions,

such as ATP-ATPase interactions, could indicate that this defect might be of a fundamental nature leading to the changes in other parameters already clearly documented.

From the view point of these hypotheses it is interesting to deduce the possible reason for the reduction in the 'non-ionized' fraction of plasma magnesium after lithium treatment. Since magnesium is involved in the structural stabilization of proteins, (Wacker, 1969), it is possible that lithium, with its similar crystal ionic radius and polarizing power, could insinuate itself into the same or similar sites in the structure. In this case, the non-ionized magnesium fraction will decrease and the plasma ionized magnesium fraction will increase due to released Mg^{2+} ions. The free excess ions would be removed by the homeostatic mechanisms controlling plasma ionized magnesium, and would either be excreted or transferred to intracellular or bone compartments.

In this laboratory we are undertaking experiments to determine the effects of lithium on the distribution and metabolic balance of other ions. Preliminary results indicate that during lithium treatment of rats the daily urinary excretion of magnesium rises, but returns to about normal levels on cessation of lithium administration. This finding has been confirmed by Gotfredsen *et al.* (1969).

If in fact lithium can be shown to compete with magnesium at sites in some phase of plasma or elsewhere, a useful pharmacological model would be available for the evaluation of the role of magnesium in psychophysiology.

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ECT

DEAR SIR,

Literature on ECT is becoming an ever increasing dreary repetition of past work, or 'abusing the plaintiff's attorney' with great statistical expertise.