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50 Years Ago in *THE JOURNAL OF PEDIATRICS*

Magnesium Supplementation in Protein-Energy Malnutrition: The Current Practice

Rosen EU, Campbell PG, Moosa GM. Hypomagnesemia and magnesium protein-calorie malnutrition. J Pediatr 1970;77:709.

There was no consensus on magnesium therapy and thus a persistent dilemma regarding routine supplementation of magnesium in severe protein-energy malnutrition (PEM). In 1970, Rosen et al published this trial in *The Journal* on parenteral magnesium therapy in children suffering from severe PEM. Serum magnesium levels were low at admission in most of these children. However, clinical features clearly attributed to hypomagnesemia were not identified. They concluded that magnesium therapy did not produce any therapeutic response in treated children compared with untreated children.

The landmark study of Caddell et al on magnesium therapy in malnourished children must be mentioned.[1] Muscle biopsies and plasma were deficient in magnesium, clinical features compatible with magnesium deficiency were documented, and it was concluded that magnesium therapy hastened recovery and decreased mortality in children with PEM. This work appeared 3 years earlier than the Rosen paper, but has stood the test of time. Low magnesium levels in blood, muscle biopsy, and the cerebrospinal fluid, now an established finding in PEM, may be due to inadequate intake, malabsorption, recurrent diarrhea, or infections. Various neuromuscular manifestations and electrocardiogram changes in PEM are attributed to magnesium deficiency. Nicholas et al concluded that magnesium supplementation accelerated recovery in PEM by 2 weeks and recommended oral supplementation.[2] Currently, the World Health Organization recommends routine supplementation of all severely malnourished children with magnesium.[3] On day one, 50% magnesium sulfate (2 mmol/L) should be administered intramuscularly (0.3 mL/kg, maximum 2 mL) followed by daily oral magnesium (0.2-0.3 mL/kg/day) mixed with feeds for the next 2 weeks. This can be done by the addition of an electrolyte/mineral mix or solution containing magnesium to the feeds. In case of nonavailability of mineral mix or an inability to prepare the mineral solution, it is recommended to add injection magnesium sulphate to feeds. The last 50 years have witnessed a paradigm shift in our understanding of magnesium—from being an innocent bystander to an active player in the pathogenesis and therapy of severe acute malnutrition—the current avatar of severe PEM.

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