



Hypomagnesemia and cisplatin nephrotoxicity

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In the study titled “mild hypomagnesemia as the most common cisplatin nephropathy in Iran,” the authors aimed to evaluate of cisplatin nephrotoxicity in a group of cancerous patients (1). They studied 100 patients and they found a mild hypomagnesemia (grade 1 toxicity) in 18%, without any symptoms or other electrolyte abnormalities. In this study, we would like to remind a few points about cisplatin therapy and magnesium.

In a pre-clinical study, 29 Wistar rats were randomly assigned to 4 groups. Groups 1-3 received 20, 80, and 200 mg/kg magnesium sulfate respectively, for 10 days, and on day 3, a single dose of cisplatin (seven mg/kg, i.p.) was also injected. Group 4 (positive control group) received the similar regimen of groups 1-3 except saline instead magnesium sulfate. One week after cisplatin administration, blood samples were taken and all animals were killed for renal histopathological investigations. We found that, the low dose of magnesium supplementation intensifies kidney toxicity and renal dysfunction in cisplatin-induced nephrotoxicity in the rat model (2).

It is well known that, hypomagnesemia develops after cisplatin therapy and magnesium therapy is recommended to patients to prevent the hypomagnesemia after cisplatin treatment (1-4). However, one major question is whether magnesium supplementation is associate with attenuation of cisplatin-induced nephrotoxicity?

Studied revealed that, there is a relationship between magnesium and nitric oxide (5) and it is possible that magnesium deficiency can result in a rise in plasma nitric oxide in rat model of cisplatin toxicity (6). In our study, cisplatin decreased the serum level of nitric oxide in all groups and no significant difference between groups was seen. This reduction in nitric oxide level may be related to endothelial damage induced by cisplatin (5,6) and magnesium supplementation could not improve this disturbance (2). Other investigations detected that cisplatin-provoked hypomagnesemia is not related to the total dose of this drug (7) and in animal studies, hypomagnesemia develops from the third week after cisplatin administration (7-9). Moreover, in some studies an increase in the serum magnesium after supplementation was not expected. In our study in rats, we found, that

■ Implication for health policy/practice/research/medical education

Hypomagnesemia develops after cisplatin therapy and magnesium therapy is suggested to patients to prevent the hypomagnesemia after cisplatin therapy. Supplementation of magnesium may promote kidney toxicity of cisplatin, and therefore further studies are required to determine the exact role of magnesium in cisplatin metabolism.

■ **Keywords:** Magnesium, Cisplatin, Nephropathy

under some conditions, supplementation of magnesium may promote kidney toxicity of cisplatin, and therefore further investigations are necessary to verify the exact role of magnesium in cisplatin metabolism.

Conflicts of interest

The author declared no competing interests.

Author's contribution

HN was the single author of the paper.

Ethical considerations

Ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication or submission, redundancy) have been completely observed by the author.

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