

Magnesium in oncology: New insights in a forgotten cation

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Oncology had not paid much attention to the electrolyte magnesium so far. However, it plays an important role in numerous physiological and pathophysiological processes, e.g. in anti-cancerogenesis, regulation DNA- and RNA synthesis, mitosis, metastasis, nuclear repair mechanisms, and apoptosis. In oncological therapies, negatively influencing renal function, as cisplatinium, severe hypomagnesaemia can occur, as shown by own studies, which often requiring treatment. A new aspect arose from the introduction of the epidermal growth factor receptor (EGFR) antibodies in the oncological therapy, particularly in colorectal cancers. These lead by an interaction with the transient receptor potential cation channel TRPM6 in the majority of patients to a clinical hypomagnesaemia and in 10% to 36% of cases to severe grade III/IV hypomagnesaemia. Thereby, interestingly it appeared that there is a significant positive correlation between hypomagnesaemia clinical responses to the antibody therapy as well was to a significantly better survival. The underlying mechanism is nearly unknown, but maybe similar factors, as we postulated in hypomagnesaemia and radiotherapy, for example the inhibition of DNA repair in tumor cells. Another new and exciting aspect of magnesium is the treatment of hot flashes due to hormonal deprivation therapy. Magnesium is known for its neuro- and vasoactive effects. So far, there are only some small clinical studies and few case reports on this topic. In an own pilot study with 6 patients suffering from breast cancer and hot flashes under hormonal deprivation were treated with 300 to 600 mg magnesium orally over 4 to 6 weeks. In 5/6 (83%) of patients a marked improvement of symptoms was observed. Thereby the strength as well as the frequency of hot flashes was alleviated significantly. In the light of the recent study data, magnesium remains a highly interesting ion for oncology, whose different facets should be more and more enlightened.

Biography

Oliver Micke has completed his PhD from Muenster University Hospital in 2006. He is Head of the Department for Radiotherapy and Radiation Oncology at the Franziskus Hospital Bielefeld since 2006. In addition he is the Medical Director of Franziskus Hospital Bielefeld, a premier teaching hospital of the Medical University of Hanover (MHH). He has published more than 200 papers in reputed national and international journals and has been serving as reviewer as well as an Editorial Board Member of repute.

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