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Effect of intravenous magnesium on ventricular tachyarrhythmias associated with acute myocardial infarction.

Thiele R[1], Protze F, Winnefeld K, Pfeifer R, Pleissner J, Gassel M.

Author information

[1]Intensive Care Unit, Friedrich-Schiller University, Jena, Germany.

Abstract

Ventricular ectopy and left ventricular dysfunction are important predictive factors for an unfavourable outcome following an acute myocardial infarction (MI). Tachyarrhythmias are a major cause of death subsequent to MI. Magnesium was postulated to have an antiarrhythmic effect after MI. Therefore we have investigated the influence of intravenous and oral magnesium (Mg) therapy on ventricular tachyarrhythmias. 67 patients with myocardial infarction (MI) diagnosed according to the WHO criteria of anamnesis, infarct-specific electrocardiogram (ECG), and enzymatic status were included in a prospective study. 23 patients (group 1) received 2 g Mg per day (= 82 mmol Mg/24 h) intravenously for the first 3 days followed by oral magnesium adipate administration of 3 x 2 coated tablets of magnesium 50 Apogepha (= 300 mg Mg/24 h or 12.34 mmol Mg/24 h, respectively) for the full duration of the study. 26 patients (group 2) received only i.v. magnesium for the first 3 days after admission (2 g Mg/24 h). The results of this treatment were compared to those of a control group of 18 MI patients without magnesium administration. All groups were identical with regard to other forms of treatment. The magnesium levels in serum and erythrocytes of all patients were measured at the following time points: days 0 (admission time), 1, 2, the day of discharge (about day 20) and after 12 weeks. The tachyarrhythmias were monitored by 24-h-continuous-electrocardiography on days 0, 1 and on the day before discharge (about day 20). The serum magnesium levels rose significantly during i.v. Mg-administration (1 and 2 day) but decreased in group 2 subsequently until the time of discharge from hospital. In contrast group 1 patients receiving oral as well as intravenous magnesium did not show this drop. The uptake of magnesium into the erythrocytes was less obvious. The erythrocyte magnesium concentration of the control group remained significantly low in serum and red blood cells. Significantly less ventricular premature beats and runs (< 5 ventricular premature beats and > 5 ventricular premature beats) compared to admission day were observed in both treated groups. These data suggest that the frequency of ventricular tachyarrhythmias is reduced by administration of intravenous magnesium and support an early high dose administration of intravenous magnesium in the wake of myocardial infarction.

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