УДК 61:615.1(062)(476-25)
ББК 52я73
А 43
ISBN 978-985-21-1008-2

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MAGNESIUM SULFATE AND PROTECTING AGAINST CEREBRAL PALSY

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Background. Preeclampsia is a condition in which the blood pressure in pregnant women increases and the urine contains a substance that causes swelling of the legs, feet and hands. It can be mild to severe. It can happen earlier or just after delivery. It is a serious disease that may endanger the health of mothers and infants and can lead to death in rare cases. Additional symptoms can be impaired hepatic function, progressive renal insufficiency and pulmonary edema. Also Eclampsia, a rare illness in which high blood pressure produces seizures, arises in severe cases of preeclampsia. The only cure for preeclampsia is to give birth. The symptoms of preeclampsia can even last for more than 6 weeks after delivery. Infants born to women at high risk of premature birth have been shown to be protected from cerebral palsy by magnesium sulfate.

The first-line treatment for primary and recurring eclamptic seizures is magnesium sulfate. Magnesium may cause vasodilation via promoting endothelial cell synthesis of prostacyclin or by preventing platelet aggregation. During an eclamptic episode, cerebral vasodilation lowers ischemia caused by cerebral vasospasm. Magnesium sulfate also competes with calcium to prevent it from entering synaptic terminals, affecting neuromuscular transmission.

Aim: the goal of the study was to see how effective magnesium sulfate has been at treating preeclampsia in pregnant women and preventing the development of cerebral palsy in newborns.

Materials and methods. This study is based on "A Randomized, Controlled Trial of Magnesium Sulfate for the Prevention of Cerebral Palsy" in The New England Journal of Medicine in year 2007, 2008 and 2009. The three large randomized placebo-controlled studies, as well as a Cochrane Review, were conducted on the use of magnesium sulfate and its efficacy. The treatment is classified into two categories: active and recurring seizures. Treating active seizures with IV magnesium sulfate in a loading dose of 4 g given over 5-10 minutes by infusion pump, followed by a 1 g/hour infusion maintained for 24 hours after the last seizure, and treating recurrent seizures with an additional bolus of 2 g or an increase in the infusion rate to 1.5 or 2 g per hour.

Results and discussion. The study of a total of 2241 women was randomly assigned. The two groups had identical baseline characteristics. 95.6 percent of the infants were followed up properly. The First phase of study showed a primary outcome rate not substantially different between the magnesium sulfate and placebo groups (11.3 percent and 11.7 percent, respectively; relative risk, 0.97; 95 percent confidence interval, 0.77 to 1.23). However, in a secondary study, the magnesium sulfate group had a considerably lower rate of moderate or severe cerebral palsy (1.9 percent vs. 3.5 percent; relative risk, 0.55; 95 percent CI, 0.32 to 0.95). The risk of death was not statistically different between the groups (9.5 percent vs. 8.5 percent; relative risk, 1.12; 95 percent CI, 0.85 to 1.47). There was no life-threatening situation for any of the women.

Conclusions. Magnesium sulfate is a tocolytic drug that has been shown to be effective against preeclampsia due to its low cost and excellent safety profile. None of the more than 3000 women who received the drug in the trials experienced any life-threatening events or maternal deaths, and it reduced the incidence of moderate eclampsia and cerebral palsy. The findings of these studies strongly support the use of magnesium sulfate to reduce the risk of cerebral palsy in early preterm birth survivors.