

Pulmonary edema as an acute complication of ritodrine therapy in the presence of maternal intrauterine infection

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Introduction

It is well known that betamimetic drugs and magnesium sulfate have been associated with an increased incidence of pulmonary edema, especially when used in patients with an infectious complication [1]. Here, we present two cases of pulmonary edema occurring early after the initiation of ritodrine therapy, without fluid overload, in patients with premature rupture of the membranes (PROM) associated with intrauterine infection.

Case 1

A 25-year-old female, gravida 0, para 0, was admitted for preterm PROM at 26 weeks gestation. Prophylactic antibiotics were administered intravenously. On admission, the patient had regular uterine contractions and increased body temperature to 39.6 °C with a high plasma CRP concentration (15.4 mg/dl). The patient received intravenous prophylactic antibiotics and ritodrine infusion therapy (started at 50 µg/min, increased to 150 µg/min) combined with magnesium sulfate (1.0 g/hr) and dexamethasone (12 mg). Seven hours after admission an emergency caesarean section was performed because of acute fetal bradycardia. The fluid intake and output had been balanced after admission. Twelve hours after the operation the patient complained of dyspnea. A chest X-ray was consistent with bilateral pulmonary edema. The patient's symptoms rapidly abated with administration of diuretics, fluid restriction and supplemental oxygen. The subsequent chest X-ray showed resolution of pulmonary edema over the next three days.

Case 2

A 30-year-old female, gravida 1, para 1, with a history of uterine myoma, was admitted with a week history of lower abdominal pain at 27 weeks of gestation. On admission, the patient had preterm PROM and an intravenous ritodrine and high plasma CRP concentration (16.9 mg/dl) was noted with marked increase in body temperature. After magnesium sulfate was begun at increasing doses of 50-170 µg/min and 1.0 g/hr, respectively, and then dexamethasone (two 12 mg doses) com-

bined with prophylactic antibiotics, the PROM fence was applied under spinal anesthesia because of oligohydramnios and suspected chorioamnionitis.

Ten hours after the operation (14 hours after admission) she complained of shortness of breath. Chest X-ray confirmed the presence of extensive bilateral pulmonary edema. Fluid balance was negative until the onset of pulmonary edema. The ritodrine was discontinued, and furosemide, fluid restriction and supplemental oxygen gradually improved the pulmonary edema. On the third day after application of the PROM fence, an emergency caesarean section was performed because of acute fetal bradycardia.

Discussion

The association of ritodrine therapy and pulmonary edema has been well established. This complication has been reported in up to 9% of cases [2]. Pulmonary edema usually occurs several days after initiation of ritodrine therapy or even a few hours after delivery [3]. The precise mechanisms of pulmonary edema are not known, but they probably are multifactorial and may be potentiated by medications given concomitantly, such as magnesium sulfate, corticosteroid or anesthetic agents especially when there is volume loading or transfusion therapy. Together with the surgical stress, infection might play a role in the development of pulmonary edema by increasing pulmonary vascular permeability [4].

On the other hand, our cases were characterized by the early development of pulmonary edema within 24 hours after the initiation of usual doses of ritodrine, magnesium sulfate and dexamethasone therapy, without positive fluid balance in a patient with a severe maternal infection before the initiation of ritodrine therapy. It is, however, unclear why pulmonary edema developed within 24 hours after ritodrine therapy had been initiated without positive fluid balance in the present cases. The postulated mechanisms include excessive pulmonary vascular permeability due to severe maternal infection and/or hemodynamic changes during spinal anesthesia, superimposed on sodium and water retention by ritodrine, magnesium sulfate and corticosteroid therapy.

It is therefore concluded that, in the early stages of ritodrine therapy in combination with magnesium sulfate and corticosteroid therapy, greater attention should be paid to a strong association between the early development of pulmonary edema and the presence of maternal infection

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in patients being treated for preterm PROM with chorioamnionitis using tocolytic agents and steroids even in the absence of positive fluid balance.

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