

Impact of intravenous infusion of labetalol combined with magnesium sulfate versus hydralazine combined with magnesium sulfate on fetomaternal hemodynamics in severe preeclampsia

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Abstract

Preeclampsia (PE) is a multi-system disorder of widespread vascular endothelial malfunction and vasospasm, characterized by new onset of hypertension and either proteinuria or end-organ dysfunction or both after 20 weeks of gestation in a formerly normotensive woman. Albeit most influenced pregnancies convey at term or close term with adverse maternal and fetal outcome, these pregnancies are at expanded danger for maternal and fetal mortality or morbidity worldwide (Hutcheon et al. [2011](#)). Preeclampsia is further sub classified into, mild and severe, early onset and late-onset syndrome (American College of Obstetricians and Gynecologists; Hypertension in Pregnancy

Preeclampsia has a complex pathophysiology; the essential etiopathogenesis being played by the placenta (Roberts and Cooper [2001](#)), as defective invasion of the spiral arteries by cytotrophoblast cells is detected during preeclampsia (Fisher et al. [2009](#)). This might be because of the nitric oxide pathway that controls the vascular tone. Increased uterine arterial resistance triggers higher sensitivity to vasoconstriction and subsequently chronic placental ischemia and oxidative stress, which cause intrauterine fetal growth retardation (FGR) and death. In addition, oxidative stress actuates release of substances into the maternal circulation such as free radicals, cytokines, and vascular endothelial growth factor 1. These abnormalities are in charge of endothelial dysfunction (Roberts [1998](#)), with vascular hyperpermeability, and hypertension.

Patients and methods

In this prospective comparative randomized study, a total of 50 pregnant women in severe preeclampsia with gestational age ≥ 32 weeks were randomly recruited into two groups. Group A: 25 patients received labetalol with magnesium sulfate, and

group B: 25 patients received hydralazine with magnesium sulfate by intravenous infusion in an escalating manner according to response until the target blood pressure $\leq 145/95$ mmHg was achieved. Blood pressure, maternal heart rate, fetal heart rate, and Doppler ultrasound indices of umbilical and middle cerebral arteries were studied before and after treatment.

Results

A significant reduction of the maternal blood pressure was achieved in both groups, with significant reduction of maternal heart rate in group A. No significant changes in the umbilical and middle cerebral arteries pulsatility index, resistance index, and systolic/diastolic ratio before and after treatment were noted in both groups.

Discussion

Preeclampsia is a pregnancy complication characterized by hypertension and signs of damage to other organ systems. Despite the fact that the cause is not completely comprehended, variables thought to have a part include genes, the immune response, the placenta, and maternal vascular disease (Roberts and Cooper [2001](#)). The target of treating extreme hypertension is to avoid organ damage and congestive heart failure without influencing utero-placental perfusion

Conclusion

We concluded that both labetalol and hydralazine intravenous infusion regimens are well tolerated and effective in controlling severe hypertension in pregnant women with severe preeclampsia in combination with magnesium sulfate. Both drugs are reassuring as they are not related to any significant changes in fetoplacental circulation. Fetal heart rate did not change significantly after treatment in both groups.

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