Efficacy of Very Low Dose Prostaglandin E1 in Duct-Dependent Congenital Heart Disease

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Introduction and Aim: Prostaglandin infusion treatment is of vital importance for keeping the ductus arteriosus patency while waiting for either open surgery or invasive transcatheter intervention in duct-dependent congenital heart disease. Our study aimed at defining the lowest effective prostaglandin E1 dose in patients with inadequacy of both pulmonary blood flow and blood mixing (Group 1) and those with inadequate systemic blood flow (Group 2).

Methods: Patients referred to our center within two weeks from birth following the diagnosis of duct-dependent congenital heart disease and the start of intravenous prostaglandin E1 infusion were included in the study. Patients with inadequacy of both pulmonary blood flow and blood mixing (Group 1) and those with inadequate systemic blood flow (Group 2) were retrospectively evaluated in two separate groups with regard to the prostaglandin E1 starting dose given in the referring facility, the lowest and the highest dose administered in our center, treatment duration, adverse effects and administered treatment.

Results: Of the 95 patients considered in the study, 69 (72.6%) belonged to Group 1 and 26 (27.3%) to Group 2. No difference between the groups could be detected as to sex or birth weight (p=0.95 and 0.42, respectively). A statistically significant difference could not be established for prostaglandin treatment duration, 9.73±0.81 days in Group 1 and 11.6±1.05 in Group 2 (p=0.064). While the prostaglandin starting dose given to both groups in the referring facility was 0.067±0.003 micrograms/kg/minute, it was reduced after titration to 0.039±0.002 and 0.081±0.005 micrograms/kg/minute, respectively, and this difference between the two groups was significant (p<0.001). The dose administered to Group 1 while ductus patency was being maintained was 0.0031±0.0001 compared to 0.0042±0.005 micrograms/kg/minute for Group 2, also a statistically significant difference (p<0.001). No adverse effects, including apnea, were observed during prostaglandin E1 infusion.

Conclusion: Our findings indicate that the infusion of prostaglandin E1 at a very low dose (0.003-0.005 micrograms/kg/minute) is sufficient to maintain the patency of the ductus arteriosus. A higher dose of prostaglandin E1 may be necessary in patients with inadequate systemic blood flow.