

Oral sildenafil early after Fontan operation improves postoperative outcome

*Ovrutskiy S., Behrbohm S., Miera O., Hübler M., Nagdyman N., Peters B, Ewert P., Berger F.
German Heart Institute Berlin, Berlin, Germany*

Objective: Elevated pulmonary vascular resistance (PVR) is a risk factor for early Fontan failure. Oral sildenafil has been increasingly applied in recent years in addition to inhaled nitric oxide (NO) in an attempt to reduce PVR and improve outcome. To evaluate the efficacy of this medication we analyzed retrospectively our experience with NO and oral sildenafil after extracardiac Fontan operation (ECFO).

Methods: A total of 138 patients underwent ECFO at our institution (1997-2010). Preoperative data were in median: age 4.5 years, weight 16 kg, oxygen saturation 82%, Hb 16.0 g/dl. Pts. were selected for Fontan with median mean pulmonary artery pressure (mPAP) of 10 mmHg, median Nakata index of 228 mm²/m² and median lower lobe index of 143 mm²/m². NO was started early postoperatively if the mPAP was 16 mmHg or more. Two main groups (requiring inhaled NO (n=50) or not (n=88)) were comparatively analyzed and subgroups with oral sildenafil were added. Sildenafil was given from the 1st postoperative day and continued after discharge in the last 15 consecutive pts., who required NO, and in 7 with preoperatively elevated mPAP (14-17 mmHg) without necessity for inhaled NO.

Results: There were no differences in the preoperative data between the pts. who required inhaled NO and those who did not. The total mortality was 9 pts. (6.5%) and correlates with NO requirement (p<0.001). Longer CPB duration (> 1h, n=94) correlates with necessity of NO therapy (p=0.006).

Patients requiring NO had worst postoperative course with elevated mPAP (median 14 vs. 12mmHg, p<0.001), prolonged ventilation (median 10 vs. 86 h, p<0.001) and ICU stay (median 2 vs. 7 days, p<0.001) and higher incidence of prolonged effusions (> 10 days, p=0.004). Patients who received sildenafil in addition to NO had a better postoperative course with lower incidence of prolonged effusions compared with isolated NO group (p=0.002).

Conclusion: Necessity of inhaled NO remains a significant factor, indicating early Fontan failure.

Prolonged CPB seems to increase the PVR with NO requirement. Additional use of oral sildenafil improves postoperative outcome and reduces the incidence of pleural effusions. Further prospective and randomized studies are necessary.