Percutaneous Pulmonary valvuloplasty in patients with severe right ventricular dysfunction

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Introduction: Percutaneous pulmonary Valvuloplasty has become the standard treatment for congenital pulmonary stenosis. There are enough data regarding its safety and efficacy of this mode of treatment. However, there is less data about its safety in patients with severe right ventricular dysfunction and pericardial effusion.

Objectives: to see the outcome of patients with severe right ventricular dysfunction and pericardial effusion who have undergone percutaneous balloon pulmonary valvotomy in a sub-Saharan center.

Methods: We compared echocardiographically measured peak transvalvular gradient measured before intervention and 3 months after intervention between patients with and without severe right ventricular dysfunction. Assessment of RV function was mainly based on visual judgment of RV contractility on 2D echocardiography and Tricuspid Annular Plane Systolic Excursion (TAPSE).

Results: from Jan 2009 to November 2012, a total of 49 patients have undergone the procedure. All patients had severe pulmonary stenosis defined by echocardiographic peak transvalvular gradient of ≥70mmHg. Of the 49 patients, 20 had severe right ventricular dysfunction. Thirteen patients had mild to severe pericardial effusion. Mean age at intervention for those without RV dysfunction was 8.10±5.75 years while for those with RV dysfunction was 11.28±6.68 years. Peak systolic pressure gradient was 109.20 ± 30.08 mmHg versus 141.73 ± 38.01 (p value .005). Oxygen saturation was 95.12 ± 6.74% in those without RV dysfunction versus 77.13 ± 13.13% in group with RV dysfunction (p value .000). There were 3 mortalities, from the RV dysfunction group. The deaths were due to reperfusion injury resulting in pulmonary edema. Prolonged intubation or stepwise dilation has been employed to decrease mortality in patients with severe RV dysfunction. At 3 months following the procedure, echocardiographically measured peak gradient for those without RV dysfunction was 30.05 ± 15.10mmHg and for group with RV dysfunction, was 36.73 ± 20.81mmHg (p value .307).

Conclusion: the outcome of percutaneous intervention in those patients with severe RV dysfunction and pericardial effusion was as good as those without, if care is taken to avoid the immediate post procedure mortality due to reperfusion injury. Prolonged intubation and stepwise dilation strategies appear to help overcome mortality due to reperfusion injury in these patients.