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Pulmonary functions before and after cardiac surgery in infancy

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Objectives: To assess pulmonary functions before and after cardiac surgery in infants with congenital heart diseases and pulmonary overflow, and to clarify which echocardiographic parameter correlates best with lung mechanics. Methods: Thirty infants with left to right shunt congenital acyanotic heart diseases and indicated for reparative surgery of these lesions between 2008 and 2009 were assessed by echocardiography and pulmonary functions before the operation and at 6 months postoperatively. The following infant pulmonary function tests were performed: tidal volume (VT), respiratory rate (RR), compliance (Crs) and resistance (Rrs). Functional residual capacity (FRC) and airway resistance was assessed by baby body plethysmography. Results: The mean age of patients was 10.47 ± 3.38 months and their mean weight was 6.81 ± 1.67 Kg. VSD and combined lesions were the main cardiac diseases (26.7%). Comparison of the pulmonary function tests revealed a statistically highly significant improvement of all parameters between the pre-operative and at 6-months post-operative visits ($p < 0.0001$). Systolic pulmonary artery pressure had a statistically significant negative correlation with Crs ($r = -0.493$, $p = 0.006$) and positive correlation with FRC ($r = 0.450$, $p = 0.013$). PA and LA sizes had a statistically negative correlation with Crs/Kg ($r = -0.398$, $r = -0.395$, $p = 0.029$, $p = 0.031$, respectively). While PA size had statistically positive correlation with Reff and sReff ($r = 0.416$ and 0.604 , $p = 0.022$ $P = 0.0001$, respectively). Conclusion: Surgical correction of congenital heart disease of left to right shunt has positive impact on lung compliance and airway resistance and these parameters are closely related to left atrial size, pulmonary artery pressure and its size.