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High levels of uric acid predicts latent heart failure and need for earlier operation in infants with ventricular septal defects

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Background: High levels of uric acid (high-level UA) were reported to be a predictive indicator for prognosis in adult patients with chronic heart failure. If infants with VSD have to undergo surgery earlier, they have more serious heart failure. We predicted VSD infants with high-level UA had to undergo surgery earlier. We attempted to identify clinical presentation and cardiac function in VSD infants with high-level UA. Methods: Between 2005 and 2012, consecutive 105 infants with VSD were studied. Cardiac catheterization was performed in preparation for surgery. Venous blood sample for analysis of UA was obtained at the same point in time. We defined high-level UA as uric acid levels in the top fifth of 105 patients (UA≥5.7mg/dl). First, the timing of operation was compared between patients with high-level UA and those without high-level UA. Second, cardiac performances were determined which affected high-level UA. Results: Within 4weeks after catheterization 59% of patients were operated in high-level UA group, whereas 30% of patients in no high-level UA (p=0.032); within 6weeks 77% operated in high-level UA, whereas 40% in no high-level UA (p=0.0038). However, descriptive features which were turned up by means of daily clinical practice, such as standard deviation of body weight and cardiothoracic ratio, were not different between two groups. After multiple logistic regression analysis high-level UA was independently associated with odds ratio of 7.6 for high levels of brain natriuretic peptide (≥175pg/ml), 5.5 for elevated end-diastolic pressure of left ventricule (≥12mmHg), 13.1 for increased levels of creatinine (≥0.28mg/dl) and 13.3 for high dose of lasix (≥2.2mg/kg/d). Conclusion: Our study shows VSD infants had to undergo surgery earlier with high-level UA, although their clinical statuses were not different from those in patients without high-level UA. In addition, high-level UA was related to elevated end-diastolic pressure of left ventricle, high levels of brain natriuretic peptide, reduced renal function and high dose of diuretics. These factors were indexes which reflect worsening of heart failure in VSD infants. We could use high-level UA as the method of picking up VSD infants whose heart failure is worsening and who needs earlier surgical intervention.