

The Relationship between Plasma Fibroblast Growth Factor-23 Concentration and Preclinical Cardiovascular Damages in Children with Primary Hypertension

*Shi L., Lin Y., Liu Y.Y., Zhang H.W., Liu Y., Zhang M.M., Huang X.L., Hou D.Q., Cui X.D.
Children's Hospital, Capital Institute of Pediatrics, Beijing, China*

Objective: Fibroblast growth factor-23 (FGF-23) has been reported to be associated with cardiovascular diseases including hypertension. This study is to investigate the association between plasma FGF-23 and preclinical cardiovascular damages.

Methods: With prospective study, 77 patients with primary hypertension were enrolled. The 2004 NHBPEP diagnosis criteria were referred. Basic clinical features were recorded. Carotid wall intima-media thickness (cIMT) and left ventricular hypertrophy (LVH) were assessed as index of preclinical cardiovascular damages. Patients were divided into increased cIMT group and normal cIMT group. LVH and left ventricular geometry was identified, and patients were divided into normal geometry, eccentric remodeling, concentric remodeling and concentric increased LV mass group. Concentration of plasma FGF-23 was detected in all children by ELISA test, and differences were analyzed.

Results: There were 27 patients (35.1%) with LVH in the whole 77 patients, while 50 patients (64.9%) without LVH. There were 64 patients who had cIMT data, while 18 patients (28.1%) with increased cIMT and 46 (71.9%) with normal cIMT. The concentration of plasma FGF-23 in children with increased cIMT (n=18) was higher than normal group (n=46) [55.6(46.2, 63.5) RU/ml vs 48.6(39.4, 57.3) RU/ml], which showed the positive relationship between plasma FGF-23 and cIMT ($r=0.222$, $P=0.032$). ROC curve analysis showed the cutoff value was 53.9 RU/ml with the predictive sensitivity of 55.6% and the specificity of 71.7%. The concentration of plasma FGF-23 was significantly higher in patients with LVH than those with normal geometry [55.0(46.8-65.7) vs 48.2(39.5-56.0)], which showed the positive relationship between plasma FGF-23 and LVH ($r=0.224$, $P=0.018$). The concentration of plasma FGF-23 in patients with concentric remodeling (n=10) was significantly higher than that of the normal geometry (n=50) ($P=0.036$). ROC curve analysis showed the cutoff value was 49.1 RU/ml with the predictive sensitivity of 70.4% and the specificity of 60.0%.

Conclusions: There were some patients who had preclinical cardiovascular damages including LVH and increased cIMT at diagnosis. The concentration of plasma FGF-23 in children with primary hypertension was positively related with LVH and cIMT, and it has certain diagnosis predictive value for preclinical cardiovascular damages.