Relationship Between Serum Digoxin Concentrations and Clinical Symptoms of Heart Failure in Pediatric Patients with Heart Disease

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ABSTRACT

The objective of this study was to evaluate relationship between 3 SDC (serum digoxin concentration) subgroups (low, middle and high level) and clinical symptoms of HF (heart failure) in pediatric patients with heart disease. This study was carried out in 175 Thai pediatric patients who were treated with digoxin in routine care. SDCs on steady state were divided into 3 subgroups; low level: <0.8, middle level: 0.8 to 1.2 and high level: >1.2 µg/L. Clinical symptoms of CHF (congestive heart failure) were assessed and categorized by pediatric cardiologist, by using modified Ross score; 0-2: no CHF, 3-6: mild CHF, 7-9: moderate CHF, and 10-12: severe CHF. The outcome of this study was graded no CHF (total score 0-2). The association between 3 SDC subgroups and clinical symptoms of HF were evaluated by multiple logistic regression analysis. Graded no CHF patients in the group of low, middle and high level were 94(72.3%), 14(48.3%), and 9(56.3%), respectively. Multivariable analysis by binary logistic regression indicated that patients in middle and high level groups were approximately 2.00 and 1.32 times, respectively, as likely to be graded CHF as a similar patient in low level group (odds ratio [OR]: 2.00, 95% CI: 0.79-5.00, p=0.14 and OR: 1.32, 95% CI: 0.37-4.67, p=0.67, respectively). However, there was no statistically significant relationship. The other significant factors for clinical symptoms of HF included age (OR: 0.91, 95% CI: 0.83-0.98, p=0.017), surgical treatment (OR: 0.44, 95% CI: 0.21-0.92, p=0.029) and respiratory tract infection (OR: 5.56, 95% CI: 1.72-16.67, p=0.004). This finding showed the absence of significant relationship between SDC subgroups and clinical symptoms of HF. Increasing of age and surgical treatment for removing the defect significantly increased the success of heart failure control whereas codisease, especially respiratory tract infection, precipitated the clinical symptoms of heart failure. Hopefully, the use of digoxin doses to achieve low concentration of ≤0.8 µg/L will associated with favorable clinical effects and may also reduce toxicity.