

## Preliminary Study of Low Serum Digoxin Concentration on Heart Failure in Thai Pediatric Patients with Congenital Heart Disease

Yupaporn Preechagoon<sup>1\*</sup>, Peeraya Somsaard<sup>1</sup> and Setthasiri Petcharattana<sup>2</sup>

<sup>1</sup>Department of Clinical Pharmacy, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen 40002, Thailand

<sup>2</sup>Department of Medicine, Queen Sirikit Heart Center of the Northeast, Khon Kaen University, Khon Kaen 40002, Thailand

\* Corresponding author. E-mail: [yuppre@kku.ac.th](mailto:yuppre@kku.ac.th)

### ABSTRACT

*The objective of this study was to present the controllable low serum digoxin concentrations (SDCs) on heart failure in Thai pediatric patients with congenital heart disease (CHD). The total of 32 patients (5 boys and 27 girls) with 37 SDCs at Queen Sirikit Heart Center of the Northeast, Thailand, were studied. All patients had not been considered for surgery and received digoxin for CHD at least 1 week. Clinical symptoms and grading of the severity of heart failure were assessed by pediatric cardiologist, using modified Ross score. Most of patients (59.5%) had subtherapeutic SDCs. The concentrations of controllable patients were in therapeutic level (0.8-2.0 µg/L), subtherapeutic level (0.2-0.8 µg/L) and unreliable level (<0.2 µg/L) of 50%, 72.7% and 80%, respectively. From SDC subgroups; low level (<0.8 µg/L), middle level (0.8-1.2 µg/L), and high level (>1.2 µg/L), there were patients whose heart failure could be controlled in low level group more than in middle level group (74.1% and 44.4%, respectively). According to grading of the severity of congestive heart failure (CHF), patients with no CHF were 71.4% and 75% in subtherapeutic level and therapeutic level groups, respectively. It was surprising that 75% of patients in unreliable level group had no CHF. Similar to the low level group and middle level group, percentages of patients without CHF were 77.2 and 66.7, respectively. This preliminary study shows that low SDCs expressed a trend toward controllable signs and symptoms of heart failure in such patients. The use of digoxin doses to achieve low serum concentrations of ≤0.8 µg/L had favorable clinical effect as well as in high level and may also reduce digoxin toxicity.*

**Key words:** Digoxin, Pediatrics, Heart failure, Low serum digoxin concentration

### INTRODUCTION

In pediatrics, incidence of congenital heart disease (CHD) is approximately 0.8% (Kay et al., 2001). Prevalence of heart failure in such patients is as high as