

# FALSE POSITIVE RATES OF THALASSEMIA SCREENING IN RURAL CLINICAL SETTING: 10-YEAR EXPERIENCE IN THAILAND

Yupin Jopang<sup>1,2</sup>, Bandit Thinkhamrop<sup>3</sup>, Rawiwan Puangpruk<sup>2</sup> and Paripat Netnee<sup>2</sup>

<sup>1</sup>Graduate School, Khon Kaen University, Khon Kaen; <sup>2</sup>Health Promoting Hospital, Regional, Health Promotion Center 5, Nakhon Ratchasima; <sup>3</sup>Department of Biostatistics and Demography, Faculty of Public Health, Khon Kaen University, Khon Kaen, Thailand

**Abstract.** This retrospective study aimed to describe the magnitude of false positive screening for thalassemia in a primary care setting of Thailand. The study was conducted from 1999 to 2008 and analyzed 13,745 positive cases. It involved a combination of one tube osmotic fragility (OF) and dichlorophenol indophenol (DCIP) precipitation tests. The number of cases increased over the ten-year period, corresponding well to an exponential model. Based on hemoglobin and DNA analysis, cases with  $\alpha$ -thalassemia 1,  $\beta$ -thalassemia, and hemoglobin E were defined as true positive cases, and the remaining were considered as false positives. The false positive rate was in the range of 20.1-36.1%. The proportion of false positive cases of thalassemia from the screening tests was associated with a trend which was statistically significant ( $p < 0.001$ ). The estimated cost of further hemoglobin analysis resulting from false positive cases was approximately 40.2-72.2 million THB/year for an estimated 800,000 annual births. The combination of the OF and DCIP test, which has been the strategy for screening of thalassemia and HbE in pregnant women throughout this country, resulted in a large economic burden in terms of high cost and workload associated with further hemoglobin and DNA analyses of false positive samples. Measures to reduce false positive should be developed and implemented.

---

Correspondence: Yupin Jopang, Graduate School, Khon Kaen University, Khon Kaen 40002, Thailand.

Tel: 66 (0) 43 202 420; Fax: 66 (0) 43 347 058

E-mail: jopang08@yahoo.com