

Association between age and serum ferritin level with bone age deficit in children with thalassemia major

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Abstract

Background Multiple blood transfusions in thalassemia patients lead to iron overload in bone tissue. Iron overload can be determined by serum ferritin measurement. Several studies have evaluated association between serum ferritin level and growth, but without bone age examination.

Objective To determine the association between age and serum ferritin level with bone age in children with thalassemia major.

Methods This study was conducted at Hasan Sadikin Hospital Bandung during March-May 2007. We performed physical examination, serum ferritin measurement, and bone age examination. Data were analyzed with χ^2 to determine association between variables. The association between age and serum ferritin level with bone age deficit was analyzed with regression logistic model.

Results Subjects consisted of 49 patients with thalassemia major. All subjects had bone age deficit. Most boys were in age group of ≥ 10 years and had bone age difference ≥ 36 months, while most girls were < 10 years and had bone age difference < 36 months. Subjects with bone age difference < 36 months mostly had serum ferritin level $< 5,000$ ng/dL, while most subjects with bone age difference ≥ 36 months had serum ferritin level $\geq 5,000$ ng/dL. This was statistically significant ($\chi^2=4.573$, $P=0.032$). There was association between age and bone age deficit (OR=13.461, 95% CI 3.199;56.640), but not with serum ferritin level (OR= 2.199, 95% CI 0.532;9.095).

Conclusion In thalassaemic children, bone age deficit is associated with age, but not with serum ferritin level. [Paediatr Indones 2008;48:33-36].

Keywords: growth, serum ferritin level, bone age, thalassemia major

Thalassemia major is a chronic disease that leads to growth impairment such as short stature and delayed puberty.¹⁻³ Study in Malaysia shows that the prevalence of short stature in transfusion-dependent thalassemias was 54.5%,⁴ and was more prevalent in the age of 10 years.⁴ Thalassemia major causes severe anemia that needs regular transfusion with hypertransfusion method. This method leads to iron overload which may result in endocrine abnormalities and bone disturbance.⁵

Iron overload can be determined by direct and indirect methods. Direct method with liver biopsy is the most accurate one, but it is invasive. Indirect method with serum ferritin level measurement is reliable, easy to perform, low cost, and had no side effects.⁶ There were several studies evaluated the association between serum ferritin level and growth impairment,^{4,7,8} but they did not perform bone age examination.

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