



THE EFFECTS OF ONCE-WEEKLY COMPARED TO DAILY
IRON SUPPLEMENTATION ON IRON STATUS, GROWTH AND
COGNITIVE FUNCTION AMONG SCHOOLCHILDREN IN
SOUTHERN THAILAND

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Title The Effects of Once-weekly Compared to Daily Iron
Supplementation on Iron Status, Growth and Cognitive
Function among Schoolchildren in Southern Thailand

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ABSTRACT

A randomized controlled trial was carried out to compare the effect of once-weekly and daily iron supplementation on iron status, growth and cognitive function. Baseline data of this trial was also examined to observe the associations between iron status and cognitive function among schoolchildren.

Four hundred and sixty-one primary schoolchildren were recruited for baseline data. Children with IDA had poorer cognitive function than their normal peers but only significantly poorer in mathematics. Unexpectedly, children who were iron deficient but not anemic had the highest IQ and school performance. IQ and school performances increased with an increase in Hb in the low SF group (≤ 20 $\mu\text{g/L}$) with a significant dose response relationship.

Conversely, cognitive function scores barely changed with Hb concentration in the normal SF group ($>20 \mu\text{g/L}$).

In a randomized controlled trial (RCT), 397 children from the baseline study completed an intervention program. These children were randomly allocated into 3 groups which were daily (received ferrous sulfate (300 mg) every schoolday), once-weekly (received ferrous sulfate (300 mg) once-weekly and placebo on the rest of the schooldays) and placebo (received placebo tablet every schoolday). Albendazole was given to eradicate hookworm infection before the intervention started.

No significant difference was found in Hb increase between daily ($6.5 \pm 6.0 \text{ g/L}$) and once-weekly ($5.7 \pm 6.3 \text{ g/L}$) iron supplementation. However the daily group ($39.8 \pm 30.3 \mu\text{g/L}$) had significantly greater increase in SF than the once-weekly group ($13.4 \pm 17.3 \mu\text{g/L}$). The once-weekly group, on the other hand, had a greater increase in height (daily = $2.4 \pm 0.9 \text{ cm}$, weekly = $2.6 \pm 0.9 \text{ cm}$) and IQ (daily = median (P25, P75) = 2 (-4,11), weekly = (5 (-1,13) than the daily group.

From both baseline study and RCT, we found evidence of adverse effects of daily iron supplementation on growth and cognition. Our findings therefore support the proposal for once-weekly iron supplementation among schoolchildren in Thailand, particularly in areas where the prevalence of thalassemia is high. Since this study is the first to report this finding, further study is needed.