

## Effect of selenium in addition to vitamin A and Iodine supplementation on the goiter size in school children in Central Java

Widardo, author

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### Abstrak

#### **ABSTRACT**

Goiter in school children is one of the symptoms of iodine deficiency for a long period. This condition will have a wide spectrum of mental, psychomotor and growth abnormalities if there is no correction immediately. According to many studies, there is an interaction between selenium, vitamin A and iodine. Indonesia has a program of iodine supplementation to eradicate IDD; however, there is still prevalence of IDD in endemic areas. It can be suspected that goiter is not only caused by low intake of iodine but also by other cause, trace elements such as selenium, calcium and other heavy metals. In Indonesia, the study of trace elements is still needed. Therefore, this study has the main objective to assess the effect of selenium and vitamin A supplementation on the goiter size among school children in Central Java.

The study was conducted in Cimanggu sub-district, Cilacap district, Central Java Province, Indonesia from November 1997 till January 1998. School children age 8 - 12 years with palpable goiter was allocated randomly into 2 groups? treatment and control. First group receive once 400 mg iodine capsule and vitamin A (200,000 [ti]; Selenium (200p.gram) twice/week for 8 weeks. Second group receive once 400 mg iodine capsule and vitamin A (200,000 IU); placebo. At the beginning and the end of the study, serum selenium, goiter size, UIE, weight and height were measured.

The prevalence of goiter based on palpation was 40.5%. By using ultrasound, the subjects with palpable goiter were 57.3% in treatment and 46.7% in control who positively suffering from goiter. Mean of selenium status of both groups was low (29.1pgll in treatment and 30.1 pgll in control) compared with normal value (86-99 µgI1). After two-month supplementation, serum selenium was increased in treatment group (29.1 to 44.1µgI1), but decreased in control group (30.1 to 23.2 p,gll). Median of Urinary Iodine Excretion before supplementation was already high, the prevalence of U1 E < 100 ggll was 5.3% in treatment and 6.7% in control. After supplementation the mean of UIE was increased significantly. The change of UIE was not different between treatment and control. Thyroid volume of both groups was decreased significantly ( $p < 0.001$ ). However, the change of thyroid volume was higher in the children with selenium supplementation compared with unsupplemented group 0.441 and 0.296 ml ( $p < 0.001$ ). The prevalence of goiter determined by ultrasound significantly decreased by 27.3% in the treatment group but it remained the same in the control group. There was an association between the change of UIE and thyroid volume in the control group, but no association between the change of serum selenium and thyroid volume in both groups. Nutritional status of those children was decreased except height for age. The change of height and Z-score of height for age were significant different between treatment and control.

In conclusion, selenium supplementation had significant effect on the reduction of thyroid volume and the

goiter prevalence determined by ultrasound. Further research is required to know the effect of selenium status on thyroid hormone metabolism in groups of iodine deficient and Vitamin A deficient human subjects.</i>