ABSTRACT

DIFFAH HANIM, Effect of Selenium and Iodine Supplement on Blood Profile Nutritional Status and IQ-Score of School Children with Some Attributes of Cretinism. Supervised by RIMBAWAN, ALI KHOMSAN, DRAJAT MARTIANTO.

Iodine Deficiency Disorder (IDD) is a public health problem especially for school-aged children living in endemic area. This condition might be worsen if the children have moderate or severe stunted and undernutrition together with IDD. This interaction was observed in this study. This study was aimed to investigate levels of some biochemical parameters, nutritional status and IQ score in school-aged children with iodine deficiency in endemic area of Boyolali Regency, Central Java. The before and after quasi experimental study design was implemented. The samples of study were school-aged children (9-12 years) suffering from iodine deficiency and Protein Energy Malnutrition (PEM) and attributed 6-11 sign of cretinism. A total number of 115 children were selected as study samples. Sampling was conducted purposively. Selenium (Se) and Iodine (I) of plasma, Haemoglobin (Hb) and Haematocrite (Ht) levels, and score of index Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH), Mean Corpuscular Haemoglobin Concentration (MCHC), nutritional status, and IQ score activity were determined. The group of treatments were Se supplement (n=34), I supplement (n=35), Se and I supplement (n=18) and placebo (n=28). The amount of Se and I given per day were 45 μg and 50 μg respectively. The study showed that before treatment the prevalence anemia based on Hb<11.5 g/dl and Ht<35% were 1.7% and 14% respectively, while microcytic and macrocytic anemia were 31% (based on MCV), 20% (based on MCH). When MCHC was used as a parameter, hypochromic and hyperchromic anemia were found 34%. Other cases such as leucopenia was observed 20.4% and deficiency of erythrocyte was 14.6%. Prevalence of Se and I deficiencies were very high (97.4% and 81.7% respectively). Anthropometrically 35% of samples were stunted and 34% were underweight. Score IQ as measured by Raven’s method showed that all of children who suffered from very severe deficiency of Selenium and Iodine (24.3% of the total samples) had IQ score lower than 25 (Idiot), 13% with IQ score between 25-40 (Imbecile), 10.7% with IQ score between 40-55 (Moron) and 8.7% with IQ score between 55-70 (borderline). Attribute of cretinism was found 6-11 signs. The nutritional status of the children were found better after all treatments. After treatments no cases of anemia based on Hb and Ht (p>0.05) were observed. Treatment with Se increased plasma Se (+2.76 μg/dl) and I (+1.35 μg/dl) which were higher than other treatments. Supplementation with Se improved blood profiles in term of leucocyte, MCV, plasma Se and I (p<0.01), and also increasing nutritional status based weight for age and IQ score (p<0.05). Iodine supplementation increased IQ score (p<0.01), and nutritional status based on height for age (p<0.05). Selenium and Iodine supplementation improved blood profiles in term of erythrocyte, MCH and MCHC (p<0.01). Based on LSD test, it was concluded that supplementation of 45 μg Se/day for two months may provide better response than supplementation of 50 μg I/day or supplementation of Se and I at the same time when intervention was conducted to 9-12 years old children with 6-11 cretinism signs.

KEYWORDS: Nutritional Status, Score IQ, MCV, MCH, MCHC, Selenium, Iodine, School Children with Cretinism Attributes