

Peripheral and Intracranial Compartment Serum Level of Selenium in Pediatric Patients with Intracranial Tumor in Department of Neurosurgery, Faculty of Medicine, Universitas Padjadjaran–Dr. Hasan Sadikin Hospital, Bandung, Indonesia: a Preliminary Study and Literature Review

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Abstract

Objective: To determine the level of Selenium (Se) in peripheral and intracranial serum in pediatric patients with intracranial tumor. Selenium has chemopreventive potentials and acts as neuromodulator.

Methods: This study was conducted on 13 pediatric patients with intracranial tumors who were treated in Dr. Hasan Sadikin Hospital, Bandung in the period of February 2014 to February 2015. Samples were taken from peripheral and intracranial serum. The results were analyzed with independent t-test and Pearson correlation test. Significance is defined as $p \leq 0.05$ with 95% confidence interval.

Results: The results showed that the average Se concentration in peripheral serum was significantly higher than the Se concentration in intracranial serum ($95.92 \pm 20.95 \mu\text{g/L}$ and $66.62 \pm 22.37 \mu\text{g/L}$, respectively). After classifying the subjects into groups based on sex, age, tumor location, and grades, the difference between Se concentrations were still statistically significant ($p \leq 0.05$), with the exception of the supratentorial group ($p = 0.0053$). Pearson correlation test showed very-low to medium strength correlations between peripheral and intracranial serum Se concentration in all groups ($r = 0.16 - 0.59$, $p > 0.05$).

Conclusions: A significant difference is seen between the peripheral and intracranial serum Se concentration means in pediatric patients with intracranial tumors, with higher concentrations observed in the peripheral serum. Further studies are required to investigate the roles of Se in the management of pediatric patients with intracranial tumors.

Received:
April 5, 2016

Revised:
May 23, 2016

Accepted:
August 3, 2016

Keywords: Pediatric intracranial tumor patients, selenium concentration in peripheral and intracranial serum [IJHS. 2016;4(2):73–9]

pISSN: 2302-1381; eISSN: 2338-4506; <http://dx.doi.org/10.15850/ijhs.v4n2.680>

Introduction

Tumor is a dreaded diagnosis due to its high morbidity and mortality rates. The prevalence of intracranial tumor is 1.4% of all tumor cases, with a mortality rate of 2.4%.¹ In individuals below the age of 20, brain tumors are the most common solid tumor and the second leading

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cause of tumor-related deaths after leukemia.

In general, the management of tumor is emphasized on three modalities: radiotherapy, surgery, and chemotherapy. However, these modalities are less feasible for the pediatric patients due to their physiological condition, making this patient group more vulnerable.² Therefore, in order to improve the quality of the therapy, other modalities like the neoadjuvant therapy, are needed. One of the aspects approached by those modalities in tumor management is the microenvironment of the tumor. The use of antioxidants is one of the more commonly studied aspects of