

# Association between serum NSE and metabolic parameters determined by 18F-FDG PET/CT in pediatric patients with neuroblastoma

Shuai Man<sup>1</sup>, Jie Yan<sup>2</sup>, Jie Li<sup>3</sup>, Yan Cao<sup>3</sup>, Jianjing Liu<sup>2</sup>, and qiang zhao<sup>2</sup>

<sup>1</sup>Tianjin Medical University

<sup>2</sup>Tianjin Medical University Cancer Institute and Hospital

<sup>3</sup>Tianjin Tumor Hospital

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## Abstract

**Purpose:** To explore the correlations between neuron-specific enolase (NSE) and the metabolic parameters such as the maximum uptake (SUVmax), metabolic tumor volume (MTV) and total lesion glycolysis (TLG), determined by fluorine-18 fluorodeoxyglucose (18F-FDG) positron emission tomography-computed tomography (PET/CT) in pediatric patients with newly diagnosed neuroblastoma(NB). **Method:** Data from 43 patients with newly diagnosed NB between December 2013 and December 2019 were collected. The serum levels of NSE were measured at the time of diagnosis, and 18F-FDG PET/CT examinations were performed within 1 weeks. The metabolic parameters of the primary tumor lesion s such as SUVmax, MTV and TLG were calculated by 18F-FDG PET/CT. Pearson correlation analyses were applied to investigate the correlations between the serum levels of NSE and PET/CT findings. **Result:** NSE had strong correlations with SUVmax, MTV and TLG ( $r=0.521$ ,  $P<0.001$ ;  $r=0.520$ ,  $P<0.001$ ;  $r=0.442$ ,  $P=0.003$ , respectively) using Pearson correlation analyses. The Mann-Whitney U tests showed that the values of SUVmax, MTV and TLG were significantly higher for the patients with NSE levels  $\geq 100$  ug/L ( $P=0.013$ ,  $P=0.013$  and  $P=0.002$ , respectively) and for patients with serum NSE levels larger than the cut-off value ( $P=0.004$ ,  $P=0.008$  and  $P<0.001$ , respectively). **Conclusion:** In patients with newly diagnosed NB, the metabolic parameters determined by 18F-FDG PET/CT could be considered as accurate markers of tumor burden, with MTV and TLG more sensitive than SUVmax. When abnormal NSE level were detected in a pediatric patient with NB, the higher the NSE level was, the larger the SUVmax MTV and TLG were.

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