



# Changes and Clinical Significance of Vitamin B1 in Children with Sepsis

Wanyu Jia<sup>1</sup> · Xue Zhang<sup>1</sup> · Peng Li<sup>1</sup> · Chunlan Song<sup>1</sup>

Received: 21 May 2023 / Accepted: 6 June 2023 / Published online: 15 June 2023  
© The Author(s), under exclusive licence to Dr. K C Chaudhuri Foundation 2023

*To the Editor:* Sepsis and septic shock are serious health-care issues that affect millions of individuals globally each year, with one-third to one-sixth dying as a result [1]. The estimated mortality rate of pediatric sepsis is 25%, and sepsis remains one of the major causes of death in children [2]. Serum thiamine levels are widely recognized to be low in patients with viral shock, severe burns, recent heart surgery, and renal failure [3]. The purpose of this retrospective study was to investigate the correlation between vitamin B1 levels and sepsis by measuring whole blood vitamin B1 levels in patients with sepsis.

One hundred children who met the diagnosis of sepsis from January 2017 through December 2018 were selected and another 100 cases of healthy children during the same period were included as the control group. The children with sepsis were divided into groups according to severity, blood glucose level and lactate level.

The results indicate that the whole blood vitamin B1 levels in the control, sepsis, and septic shock groups were 93.37 nmol/L, 48.81 nmol/L, and 38.99 nmol/L, respectively. The difference between the three groups was statistically significant. The whole blood vitamin B1 level in the elevated glucose group II (>10.0 mmol/L) was significantly lower than that in the normal glucose group (4.0-6.1 mmol/L) and the elevated glucose group I (7.1-10.0 mmol/L). In the elevated lactate group II (>4.0 mmol/L) compared with the elevated lactate group I (2-4 mmol/L) and normal lactate group (0.5-2.0 mmol/L), whole blood vitamin B1 levels

were significantly lower. The AUC for whole blood vitamin B1 in predicting sepsis vs. healthy children was 0.978 (0.962~0.994), and 0.868 (0.793~0.937) for predicting septic shock against sepsis.

In conclusion, vitamin B1 may be involved in the development of sepsis and septic shock, and the mechanism may be related to its involvement in glucose and lactate metabolism.

**Funding** This study was supported by the Henan Provincial Science and Technology Research Project (LHGJ20190926).

## Declarations

**Conflict of Interest** None.

## References

1. Evans L, Rhodes A, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock 2021. *Intensive Care Med.* 2021;47:1181–247.
2. Tan B, Wong JJ, Sultana R, et al. Global case-fatality rates in pediatric severe sepsis and septic shock: A systematic review and meta-analysis. *JAMA Pediatr.* 2019;173:352–62.
3. Marrs C, Lonsdale D. Hiding in plain sight: Modern thiamine deficiency. *Cells.* 2021;10:2595.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

✉ Chunlan Song  
13526867323@163.com

<sup>1</sup> Children's Hospital Affiliated to Zhengzhou University, Henan Children's Hospital, Zhengzhou Children's Hospital, Zhengzhou 450018, China