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## Acute blood glucose fluctuation enhances apoptosis of rat vascular endothelial cell *in vivo*

Wu Na, Shen Haitao and Han Ping

Shengjing Hospital of China Medical University, China

**Statement of the Problem:** Compared to persistent hyperglycemia, fluctuant hyperglycemia has more potential to increase microvascular lesions and the risk of death. In the condition of stress, the glucose levels of those with normal metabolic function may be very high. In this case given hypoglycemic therapy, there may be glucose decreases sharply in the hypoglycemic process, leading to acute glucose fluctuations. Chronic hyperglycemia *in vivo* and *in vitro* studies showed that fluctuant hyperglycemia could increase the apoptosis of endothelial cells. But to date, few studies have been conducted to investigate the influence of acute fluctuant hyperglycemia on endothelial cells *in vivo*.

**Methodology & Theoretical Orientation:** In the present study, an *in vivo* model of acute fluctuant hyperglycemia was successfully established. We examined the influence of acute fluctuant hyperglycemia and persistent hyperglycemia on vascular endothelial cell apoptosis, oxidative stress and inflammation *in vivo*. Rats were assigned to three different groups (n=8/group) that received 48-h infusions of saline (SAL group), continuous 50% glucose (constant high glucose group [CHG]), or intermittent 50% glucose (acute blood glucose fluctuation group [AFG]). Expression of related protein and mRNAs were measured in endothelial homogenates prepared from endothelial cells harvested from the aorta.

**Findings:** Endothelial cells apoptosis were observed significantly in the aortas of the AFG group. The AFG reduced Bcl-2 levels and enhanced Bax mitochondrial translocation levels in comparison with the CHG group (P<0.05). Compared with SAL and CHG, AFG increased MDA and 8-isoprostaglandin levels in plasma, oxidative stress in vascular endothelial cells and inflammatory cytokines in plasma and vascular endothelial cells (P<0.05).

**Conclusion & Significance:** Acute glucose fluctuation could cause significant oxidative stress and inflammation in endothelial cells, and elevate endothelial cell apoptosis, resulting in severe cardiovascular injury. Therefore, not only lowering blood glucose, but also reducing glucose fluctuation is very important in clinic.



### Biography

Wu Na works in Shengjing Hospital of China Medical University. Currently, she is studying in Cardiovascular Research Center of Lewis Katz School of Medicine in Temple University as a Visiting Scholar for one year. She has her expertise in pathological and metabolic changes in cardiovascular diseases. Her researches focus on investigating the effect and underlying mechanism of metabolic disorder on 1) atherosclerosis and vascular inflammation, 2) endothelial function. She goes into rather rigorous surgery techniques in order to establish a rat model of acute blood glucose fluctuations and aimed at further investigating the mechanisms underlying increased apoptosis of vascular endothelial cells in the condition

wun@sj-hospital.org

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