

Effect of glutamine on cell adhesion molecule _expression and leukocyte transmigration in endothelial cells stimulated by preeclamptic plasma.

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摘要

Abstract

Objective

This study analyzed plasma glutamine (GLN) concentrations in women with preeclampsia. Also, in an in vitro study we evaluated whether GLN concentration was related to surface molecule expressions on endothelial cells (ECs) and polymorphonuclear neutrophils (PMNs) and the transendothelial migration of PMNs through ECs stimulated by preeclamptic plasma.

Methods

Blood samples were collected from 20 women with preeclampsia and 15 normal pregnant women for plasma GLN analysis. In the in vitro study, human umbilical vein endothelial cells and PMNs were treated with different concentrations (0, 300, 500, and 1000 μ M) of GLN for 24 h. After that, we stimulated human umbilical vein endothelial cells for 3 h with plasma from patients with preeclampsia, and PMNs were allowed to transmigrate through ECs for 2 h. EC surface expressions of cellular adhesion molecules (CAMs) and integrin (CD11b) interleukin-8 (IL-8) receptor expressions on PMNs were measured by flow cytometry. The transendothelial migration of PMNs through ECs was also analyzed.

Results

Women with preeclampsia exhibited significantly lower plasma GLN concentrations than did normal pregnant women. The in vitro study showed that, compared with normal plasma, CAM expressions on human umbilical vein endothelial cells and PMNs were increased when preeclamptic plasma was

stimulated. Among the groups with preeclamptic plasma stimulation, intracellular CAM-1 expression on ECs and CD11b and IL-8 receptor expressions on PMNs were lower with 500 and 1000 μM than with 300 μM of GLN. IL-8 production from ECs and PMNs was also lower with 500 and 1000 μM than with 300 μM of GLN. PMN transmigration was significantly higher with 300 μM of GLN than with the other GLN concentrations.

Conclusions

Plasma GLN is depleted in women with preeclampsia. The result of this in vitro study showed that ECs and PMNs were activated after preeclamptic plasma stimulation. A low GLN concentration resulted in greater CAM expression and greater transendothelial migration of neutrophils. GLN administration at levels similar to or higher than physiologic concentrations decreased IL-8 and CAM expressions, and PMN transmigration decreased after stimulation with preeclamptic plasma.

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