Ghrelin protects musculocutaneous tissue from ischemic necrosis by improving microvascular perfusion.

Abstract:
Persistent ischemia in musculocutaneous tissue may lead to wound breakdown and necrosis. The objective of this experimental study was to analyze, whether the gastric peptide ghrelin prevents musculocutaneous tissue from necrosis and to elucidate underlying mechanisms. Thirty-two C57BL/6 mice equipped with a dorsal skinfold chamber containing ischemic musculocutaneous tissue were allocated to four groups: 1) ghrelin; 2) N(?)-nitro-l-arginine methyl ester (l-NAME); 3) ghrelin and l-NAME; and 4) control. Microcirculation, inflammation, angiogenesis, and tissue survival were assessed by fluorescence microscopy. Inducible and endothelial nitric oxide synthase (iNOS I and eNOS), vascular endothelial growth factor (VEGF), as well as nuclear factor ?B (NF-?B) were assessed by Western blot analysis. Ghrelin-treated animals showed an increased expression of iNOS and eNOS in critically perfused tissue compared with controls. This was associated with arteriolar dilation, increased arteriolar perfusion, and a sustained functional capillary density. Ghrelin further upregulated NF-?B and VEGF and induced angiogenesis. Finally, ghrelin reduced microvascular leukocyte-endothelial cell interactions, apoptosis, and overall tissue necrosis (P< 0.05 vs. control). Inhibition of nitric oxide by l-NAME did not affect the anti-inflammatory and angiogenic action of ghrelin but completely
blunted the ghrelin-induced tissue protection by abrogating the arteriolar dilation, the improved capillary perfusion, and the increased tissue survival. Ghrelin prevents critically perfused tissue from ischemic necrosis. Tissue protection is the result of a nitric oxide synthase-mediated improvement of the microcirculation but not due to induction of angiogenesis or attenuation of inflammation. This might represent a promising, noninvasive, and clinically applicable approach to protect musculocutaneous tissue from ischemia.

Zeitschriftentitel / Abkürzung:
Am J Physiol Heart Circ Physiol

Jahr: 2012
Band: 302
Heft / Issue: 3
Seiten: H603-10
Sprache: eng
Print-ISSN: 0363-6135
TUM Einrichtung:
r Plastische Chirurgie und Handchirurgie

Occurences:
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Klinik und Poliklinik für Plastische Chirurgie und Handchirurgie (keine SAP-Zuordnung!) > Lehrstuhl für Plastische Chirurgie und Handchirurgie (Prof. Machens) > 2012

entries: