

PubMed

Abstract

Full text links

Photodermatol Photoimmunol Photomed. 2006 Apr;22(2):78-86.



Biological effect of far-infrared therapy on increasing skin microcirculation in rats.

Yu SY¹, Chiu JH, Yang SD, Hsu YC, Lui WY, Wu CW.

Author information

Abstract

BACKGROUND/PURPOSE: Insufficient microcirculation of skin leads to acute and chronic tissue ischemia in cases of trauma, reconstructive surgery, diabetes mellitus and peripheral arterial occlusive disease. The autonomic nervous system and nitric oxide (NO) play important roles in maintaining blood perfusion of the skin. Far-infrared (FIR) therapy provides low energy of light emitted from an artificial radiator and has been used to treat many vascular-related disorders. Nevertheless, the mechanisms through which FIR works remain unclear. The present study aims to test the hypothesis that the effect of FIR is through increasing skin microcirculation by a mechanism other than its thermal effect.

METHODS: Sixty rats were used in the present study. A WS TY301 FIR emitter was placed 20 cm above the rats. Skin temperature and blood flow were continuously measured by a K-type thermocouple. Under laboratory control, the abdominal skin temperature steadily increased from 38-39 degrees C, and was kept at constant temperature. Skin microcirculation was measured with a continuous laser Doppler flowmeter.

RESULTS: There was no significant change of skin blood flow during FIR treatment. Skin blood flow increased significantly soon after the removal of the FIR emitter. The stimulating effect on skin blood flow was more significant in the rats treated with FIR for 45 min and could be sustained as long as 60 min. These findings suggested a non-thermic biological effect of FIR on skin microcirculation. The promotive effect of FIR on increasing skin blood flow was not influenced by pretreatment of APP (atropine, propranolol and phentolamine), but was suppressed by pretreatment with NG-nitro-L-arginine methyl ester (an endothelial nitric oxide synthase inhibitor).

CONCLUSION: In conclusion, FIR therapy exerts a NO-related biological effect to increase skin microcirculation in rats. This might bring into perspective the clinical application of FIR to treat ischemic disease by augmenting L-arginine/NO pathway.

PMID: 16606412 [PubMed - indexed for MEDLINE]



MeSH Terms, Substances

LinkOut - more resources

PubMed Commons

0 comments

[PubMed Commons home](#)

[How to join PubMed Commons](#)