

Nitroglycerin reverts clinical manifestations of poor peripheral perfusion in patients with circulatory shock. Lima A, van Genderen ME, van Bommel J, Klijn E, Jansem T, Bakker J. *Crit Care*. 2014 Jun 19;18(3):R126. [Epub ahead of print]

Introduction

Recent clinical studies have shown a relationship between abnormalities in peripheral perfusion and unfavorable outcome in patients with circulatory shock. Nitroglycerin is effective in restoring alterations in microcirculatory blood flow. The aim of this study was to investigate whether nitroglycerin could correct the parameters of abnormal peripheral circulation in resuscitated circulatory shock patients.

Methods

This interventional study recruited patients with circulatory shock who persisted with abnormal peripheral perfusion, despite normalization of global hemodynamic parameters. Nitroglycerin started at 2 mg/h and doubled stepwise (4 mg/h, 8 mg/h and 16 mg/h) each 15 minutes until an improvement in peripheral perfusion was observed. Peripheral circulation parameters included capillary refill time (CRT), skin-temperature gradient (T_{skin-diff}), perfusion index (PI) and tissue O₂ saturation (StO₂) during a reactive hyperemia test (RincStO₂). Measurements were performed before, at the maximum dose and after cessation of nitroglycerin infusion. Data were analyzed using linear model for repeated measurements and are shown as mean (SE).

Results

Of the 15 patients included, 4 patients (27%) responded with a nitroglycerin initial dose of 2 mg/h. In all patients, nitroglycerin infusion resulted in significant changes in CRT, T_{skin-diff} and PI towards normal at the maximum dose of nitroglycerin: from 9.4 (0.6) to 4.8 (0.3) sec ($P < 0.05$), from 3.3 (0.7) to 0.7 (0.6) [degree sign]C ($P < 0.05$), and from [log] -0.5 (0.2) to 0.7 (0.1)% ($P < 0.05$), respectively. Similar changes in StO₂ and RincStO₂ were also observed: from 75 (3.4) to 84 (2.7)% ($P < 0.05$) and 1.9 (0.08) to 2.8 (0.05)%/s ($P < 0.05$), respectively. The magnitude of changes in StO₂ was more pronounced for StO₂ < 75%: 11% versus 4%, respectively ($P < 0.05$).

Conclusions

Dose-dependent infusion of nitroglycerin reverted abnormal peripheral perfusion and poor tissue oxygenation in patients following circulatory shock resuscitation. Individual requirements of nitroglycerin dose to improve peripheral circulation vary between patients. Simple and fast physical examination of peripheral circulation at bedside can be used to titrate nitroglycerin infusion.