

Basic Sciences

Hemorrhagic Shock: Nitric Oxide in Anesthetized and Non Anesthetized Rats

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Background

We have previously demonstrated that hypovolemia induced by acute bleeding is accompanied by a dynamic, heterogenous and time-dependent activation of the cardiac nitric oxide synthase (NOS). This system might be involved in the hemodynamic anomalies observed after blood volume depletion.

Objective

To assess the role of the mitochondrial nitric oxide (NO) system in the adaptive response of the cardiovascular system in anesthetized and non anesthetized rats under hypovolemic shock.

Material and Methods

Animals were divided in four groups (n=7 animals per group): Group A, anesthetized control rats; group C, nonanesthetized control rats; group AB, anesthetized rats subjected to bleeding (20% of blood volume), and group CB, nonanesthetized rats subjected to bleeding. Oxygen consumption, functional activity of mitochondrial NOS (mtNOS) and mitochondrial production of NO were assessed.

Results

There were no significant differences in the values of respiratory parameters among the different study groups. Group AB had less functional activity of mtNOS compared to group A (12 ± 2 and 19 ± 1 , respectively). This effect was even lower in non anesthetized animals subjected to bleeding (17 ± 1 and 20 ± 1 , respectively). Mitochondrial production of NO decreased in anesthetized and non anesthetized animals with acute bleeding compared to controls.

Conclusions

Mitochondrial NO system might be involved in the adaptive response of the cardiovascular system under acute volume depletion, depending on the animal's degree of anesthesia.