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Hydrogen may inhibit collagen-induced platelet aggregation: an ex vivo and in vivo study

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Abstract

Objective: Hydrogen selectively reduces hydroxyl radicals and peroxynitrite, and numerous experimental and clinical studies suggest that hydrogen can exert potent cellular protective effects against a wide variety of diseases. Furthermore, there is increasing evidence that antioxidants can modulate platelet activation. The aim of the present study was to investigate the relationship between hydrogen and collagen-induced platelet aggregation.

Methods: For human ex vivo studies, we collected blood samples from six healthy humans and added normal saline or hydrogen-rich saline to blood and platelet-rich plasma. We found that collagen (1 μg/mL)-induced platelet aggregation was significantly inhibited by hydrogen-rich saline compared with a normal saline group (p=0.044). For rat in vivo studies, animals (n=17) were exposed to either nitrogen-based mixed gas with hydrogen (H2 gas group; n=9) or without hydrogen (non-H2 gas group; n=8). Additionally, another animals (n=13) administered either normal (NS group; n=7) or hydrogen-rich saline (HS group; n=6) (5 ml/kg) via intravenous infusion. Blood samples were drawn from the vena cava before treatment and from the right ventricle after treatment. Collagen (12 μg/mL)-induced platelet aggregation was then measured.

Results: Collagen-induced platelet aggregation was significantly decreased in H2 gas and HS group rats (p=0.042, 0.018, respectively), while there was no difference in non-H2 gas and NS group rats before and after treatment.

Conclusion: In summary, these data suggest that hydrogen may inhibit collagen-induced platelet aggregation.

Related information

PubChem Compound (MeSH Keyword)

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Full Text Sources

J-STAGE, Japan Science and Technology Information Aggregator, Electronic

Other Literature Sources

The Lens - Patent Citations

Miscellaneous

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