



Influence of hyperbaric oxygen therapy on thrombus formation ability in humans

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Abstract

Background: Hyperbaric oxygen (HBO2) therapy was introduced nearly 300 years ago. However, its effect on thrombus formation is unclear. This may be because platelet and coagulation functions are unstable, yielding variable results; hence, accurate measurement is difficult. Our study aimed to analyze changes in thrombus formation before and after HBO2 therapy by using a total thrombus formation analysis system (TTAS).

Methods: Six patients were prescribed HBO2 therapy for skin and soft tissue ulcers, and necrotic fasciitis. Blood samples were collected immediately before and after treatment. Then samples were put into a reservoir that connected to AR-chip to assess changes in the thrombus formation ability of both platelets and coagulation factors. We examined the differences in the thrombus formation ability using T-TAS. Time until the onset of white thrombus formation (T10) and complete occlusion of the capillary (T80) were analyzed by a two-way repeated measure analysis of variance (ANOVA).

Results: The duration to pressure increase of samples after HBO2 therapy was longer than the duration before HBO2 therapy ($p < 0.05$). This suggests decreased clot adhesiveness to the inner surface of the simulated blood vessel and reduced clot formation ability.

Conclusions: The results for T10 and T80 suggest that HBO2 therapy reduced thrombus formation ability in the enrolled patients. We believe that T-TAS is a promising method to predict the efficacy of HBO2 therapy.

Keywords: hyperbaric oxygen therapy; thrombus formation ability; ulcer.

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