

# THE EVALUATION OF OXIDATIVE STRESS AND ANTIOXIDANT STATUS FOLLOWING REPEATED HYPERBARIC OXYGEN IN PATIENTS WITH DECOMPRESSION ILLNESS



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# Background

- Hyperbaric oxygen causes oxidative stress through the production of **Reactive Oxygen Species (ROS)**.
- Some patients with Decompression Illness (DCI) need repeated HBO treatment, which leads to concerns about an accumulation of oxidative stress.

## Aim

To determine whether exposure to two sessions of U.S. Navy Treatment Table 6 increases oxidative stress and decreases antioxidant capability

The term 'oxidative stress' means a condition where the formation of Reactive Oxygen Species (ROS) exceeds the antioxidant defense capabilities.

# Methods

**Subjects:** Nine patients with DCI (M6, F3, 29 – 43, aver. 37 y/o)

**HBO:** U.S. Navy Treatment Table 6 X 2 at an interval of 3 days

**Indexes in serum:**

## *Oxidative stress*

**Reactive Oxygen Metabolites (ROM)**  
→the concentration of hydroperoxide

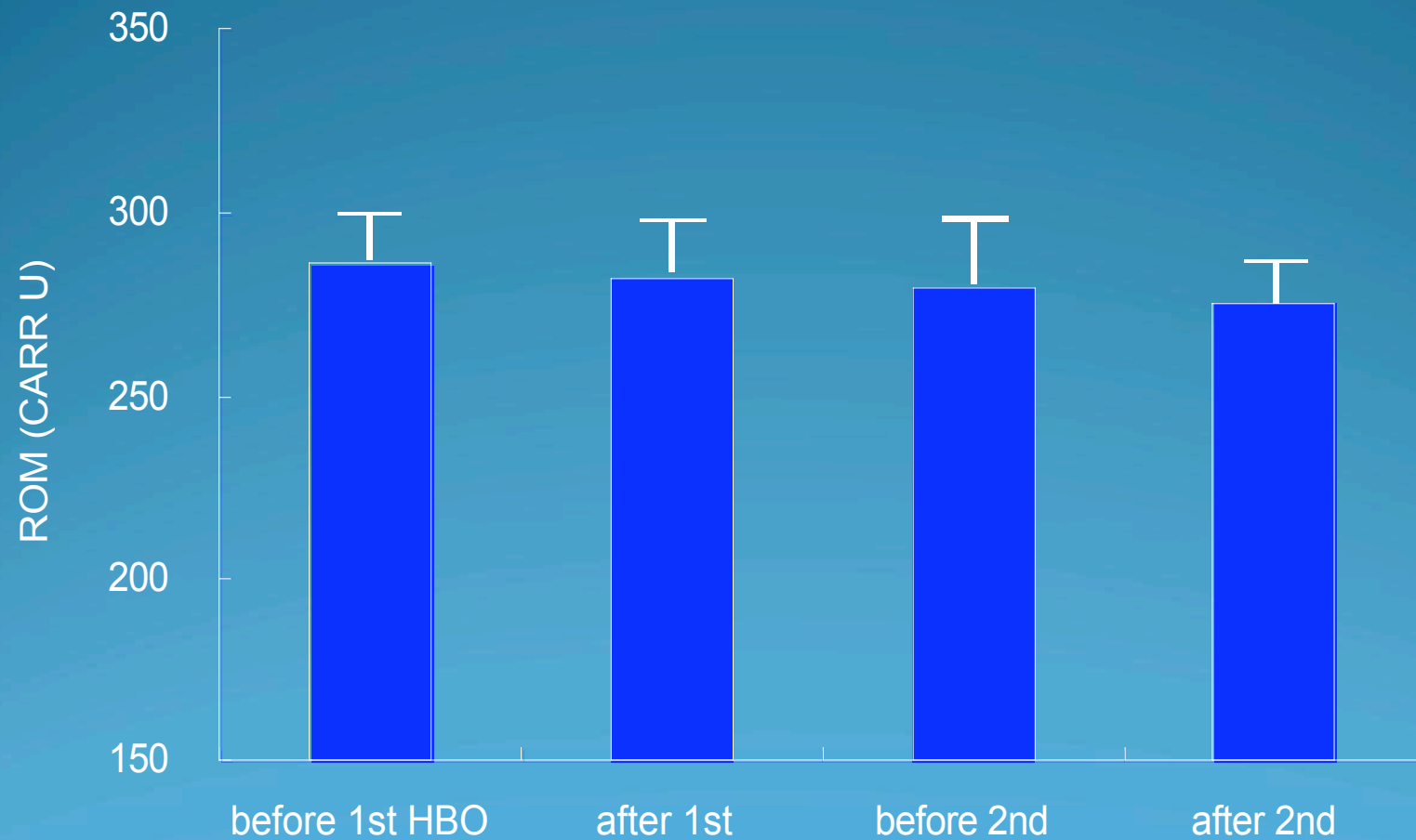
## *Antioxidant capability*

**Biological Antioxidant Potential (BAP)**  
→the ferric reducing ability

**Uric Acid (UA)**  
\_has antioxidant capability

# Reactive Oxygen Metabolites (ROM)

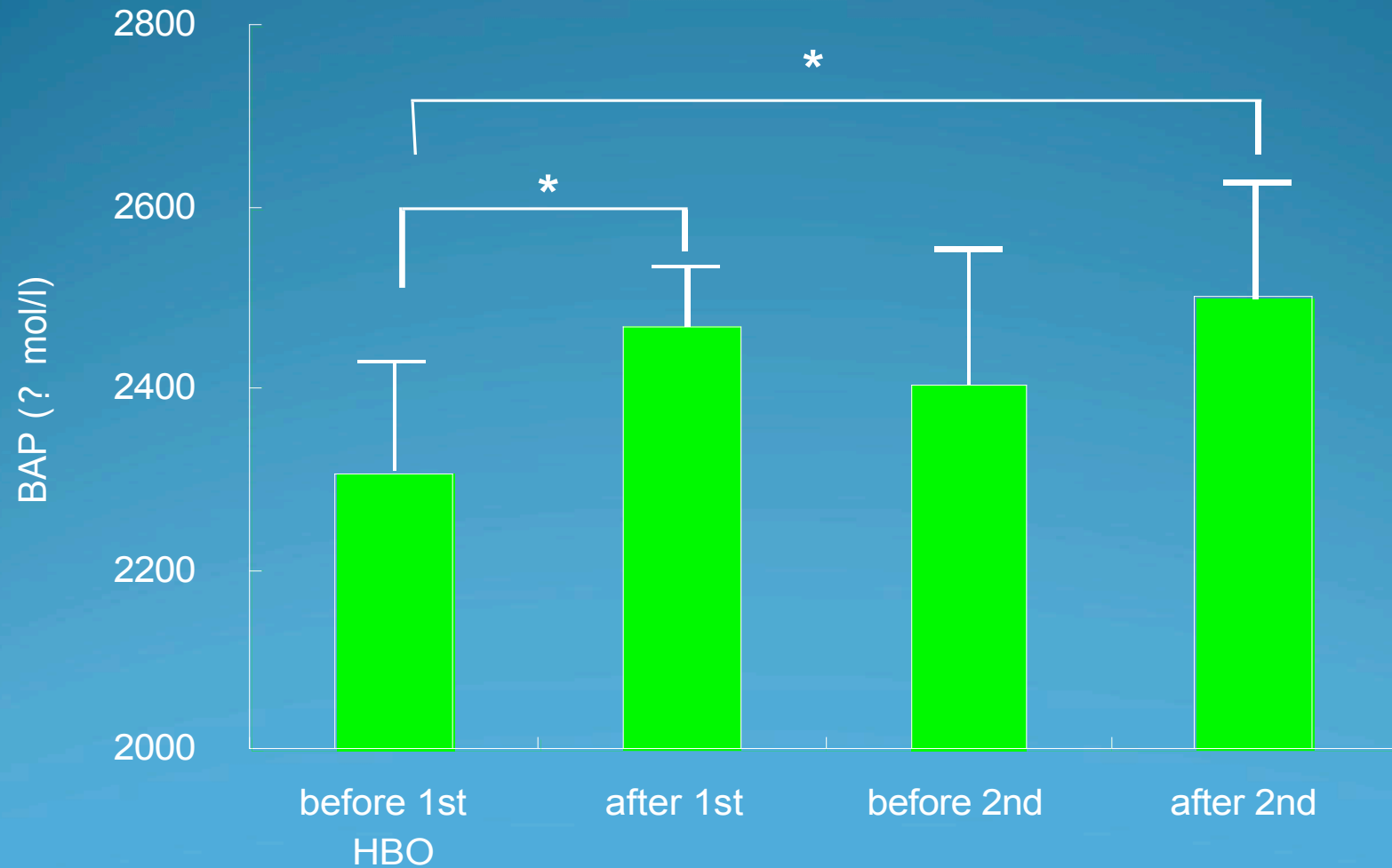
mean $\pm$ SD., n=9



# Biological Antioxidant Potential (BAP)

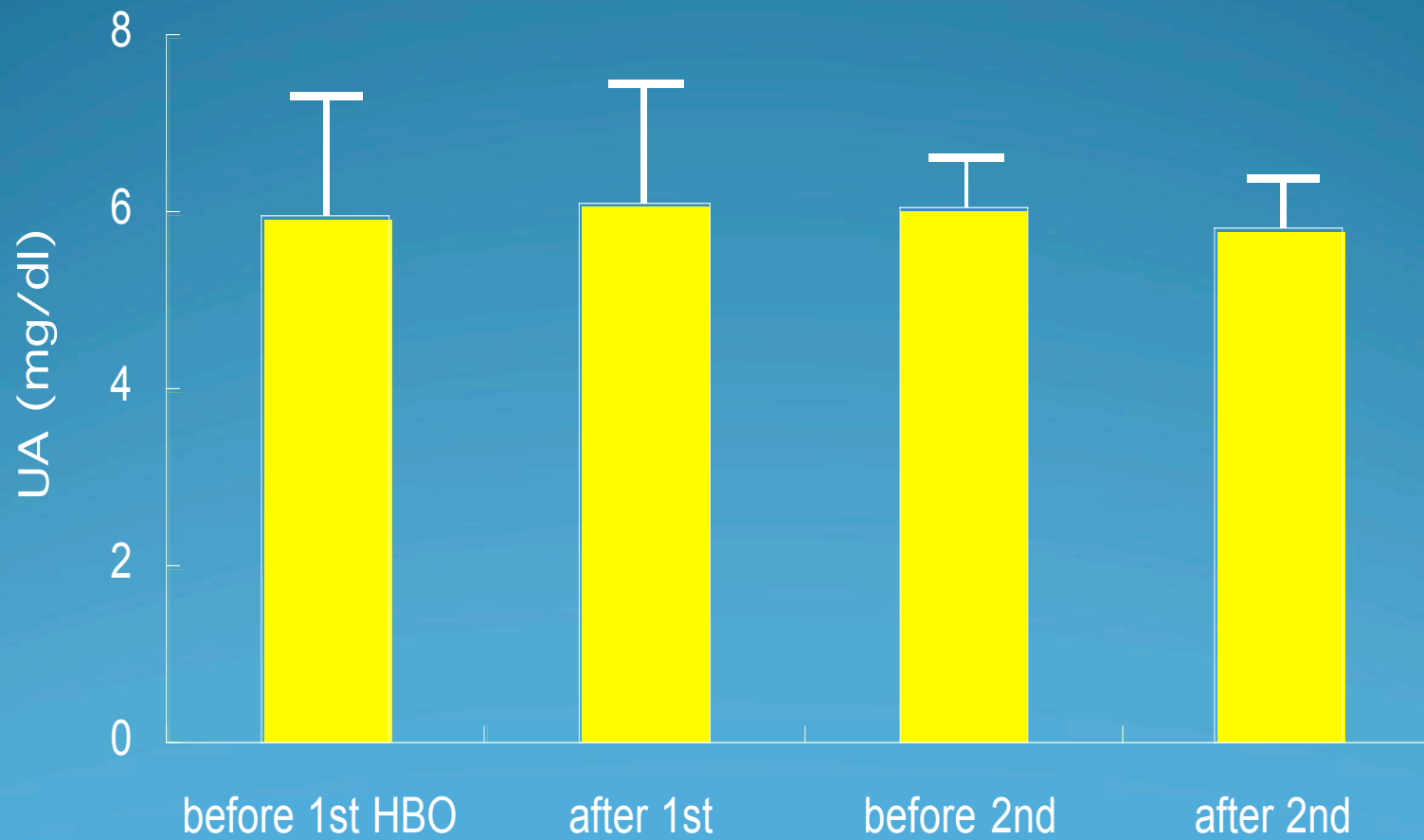
mean $\pm$ SD., n=9, ANOVA followed by Dunnett's test

\*  $P < 0.05$  vs. before the 1st HBO



# Uric acid (UA)

mean $\pm$ SD., n=9



# Summary

## [Oxidative stress]

ROM did not change during 2 sessions of Treatment Table 6.

## [Antioxidant status]

BAP significantly increased after each HBO.  
Uric acid was not affected.

→Up-regulated antioxidant capability may help explain why no accumulation of oxidative stress was found even after repeated HBO.

# Conclusions

Exposure to two sessions of Treatment Table 6 did not cause oxidative stress in patients with DCI.

Antioxidant capability was significantly increased after each HBO, which indicates that compensation for oxidative stress was induced by HBO.