**INTRODUCTION**

Decompression sickness (DCS) is malignant. But we hypothesize an aerobically “fit” person is less likely to experience hypobaric DCS than an “unfit” person given that fitness is as important as part of the denitrogenation (prebreathe, PB) process. Aerobic fitness is peak oxygen uptake (VO2peak, ml/kg/min). METHODS: Ten healthy subjects were given 165 exposures to determine VO2peak. We evaluated dichotomous DCS outcome and venous gas emboli (VGE) outcome detected in the pulmonary artery with Doppler ultrasound associated with VO2peak for two classes of experiments: 1) those with no PB or PB under resting conditions to ascent in an altitude chamber, and 2) PB that included exercise for some part of the PB. There were 169 exposures (mean VO2peak 40.5 ml/kg/min) with 25 cases of DCS in the first protocol class and 172 exposures (mean VO2peak 41.7 ml/kg/min) with 25 cases of DCS in the second. Similar incidence of the DCS (15.2% versus 14.5%) and VGE (45.5% versus 44.8%) between the two classes indicates that denitrogenation stress was similar. The relationship between VO2peak and incidence of DCS was evaluated using univariate logistic regression. RESULTS: An inverse relationship between the DCS outcome and VO2peak was evident, but the relationship was stronger when exercise was done as part of the PB (exercise PB, coef. = -0.058, p = 0.07; rest or no PB, coef. = -0.005, p = 0.86). There was no relationship between VGE outcome and VO2peak (exercise PB, coef. = -0.003, p = 0.81; rest or no PB, coef. = 0.004, p = 0.94). CONCLUSIONS: A significant change in probability of DCS was associated with fitness only when exercise was included in the denitrogenation process. We believe a fit person that exercises during PB efficiently eliminates dissolved nitrogen from tissues.

The expression of signs and symptoms of decompression sickness (DCS) are dictated by many factors, both subject-specific and environmental. Aerobic fitness, as VO2peak (ml O2/kg / min), may be linked with resistance to DCS and venous gas emboli (VGE) (1 - 6).

**METHODS**

Two general classes of experiments that include VO2peak information are available from the NASA Hypobaric Decompression Sickness Database: 169 exposures with 25 cases of DCS where no PB or PB under resting conditions was performed prior to ascent in an altitude chamber, and 172 exposures with 25 cases of DCS where exercise was performed during the PB prior to ascent to altitude. Table I shows summary information from the two classes of experiments done to understand more about hypobaric DCS and VGE outcomes.

**RESULTS**

The VO2peak for subjects who perform no PB or resting PB has no bearing on the DCS outcome as seen in Fig. 1, the slope is essentially zero.

**REFERENCES**