

LATE RATHER THAN EARLY ONSET BUBBLES IN THE PULMONARY ARTERY DURING ALTITUDE EXPOSURES CORRELATE BETTER WITH THE ONSET OF "PAIN-ONLY" DECOMPRESSION ILLNESS

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INTRODUCTION: Mechanistic insight about "pain-only" decompression illness (DCI) is limited given indirect information about venous gas emboli (VGE) detected in the pulmonary artery with Doppler ultrasound. However, we show that VGE first detected late in an altitude exposure are closely associated with subsequent symptom onset. **METHODS:** Our analysis is restricted to 103 of 787 records from tests in altitude chambers where the subject had both VGE and a symptom of "pain-only" DCI. We evaluated the correlation between the time when symptoms were first noticed and the time when VGE first appeared in the pulmonary artery during a four min monitoring period approximately every 15 min for the duration of the test. We also evaluated the difference in time between the first DCI symptom and the first VGE as a function of the time when VGE were first detected.

RESULTS: VGE first appeared 71 ± 51 min SD while DCI symptoms appeared 117 ± 65 min SD. The Pearson Correlation Coefficient for DCI and VGE times was 0.684. But the coefficient varied as a function of the VGE time: 0.138 for VGE time ≤ 60 min in 53 exposures, 0.339 for VGE time > 60 and ≤ 120 min in 37 exposures, and 0.568 for VGE time > 120 min in 13 exposures. The difference in time between the first DCI symptom and first VGE decreased as the time to first VGE increased. There was 78% association between the location of a first symptom in the left arm or leg and right arm or leg and the location and highest grade (Spencer I – IV) of the first VGE regardless of when the VGE first appeared.

CONCLUSIONS: Knowing that VGE occur late is an indication that a symptom will occur soon, but this is not a sufficient condition to guarantee that a symptom will occur.