



## The effects of chronic weightlessness on Dynamic balance ability of Professional Divers in versus healthy subjects

### Poster Presentation

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### Abstract

**Introduction:** Water immersion built a new environment in which weightlessness puts unknown demand on somatosensory system such as altered sensory integration due to the improper proprioception afferent. This condition can lead to an imprecise function of human postural balance system and as a consequence increasing fall risk. But studies focused on the short-term effects of water immersion instead of its truly long-term adaptations. Hence, the aim was to find that is there any changes in dynamic balance of divers due to exposure to microgravity environment.

**Methods:** 24 professional divers (PD) (with at least 4 years of diving experiences) and 22 healthy persons (HP) (no diving experience) were evaluated to not having recent injuries or history that affecting balance control and were allocated to the study. they were undergone Dynamic balance assessment by Y-balance test (YBT). For reducing learning process effects, participants try the test conditions (anterior, posterolateral and medial) 3 times and after 5 minutes, the average of 3 trial were recorded as score.

**Results:** The data were distributed normally (K-S  $z = 0.651$ ,  $P = 0.79$ ) and So, The Independent T test was used for evaluation. The results have shown that HP group were significantly had a better ability to maintain their balance during YBT task in versus PD ( $t = 6.28$ ,  $df = 44$ ,  $P = 0.001$ ).

**Conclusion:** Our findings showed that Divers who are repeatedly faced with weightlessness situation, are having problem in controlling their dynamic balance. As it is well documented that having proper states of controlling balance is crucial for human to meet functional demands in normal life, considering balance deficits as an important side effect of diving is suggestable by according to the current findings. furthermore, adding balance training to the routine professional divers' program should be beneficial in order to improve their balance ability.

### Keywords

Weightlessness; Balance; immersion; diving; space; microgravity

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