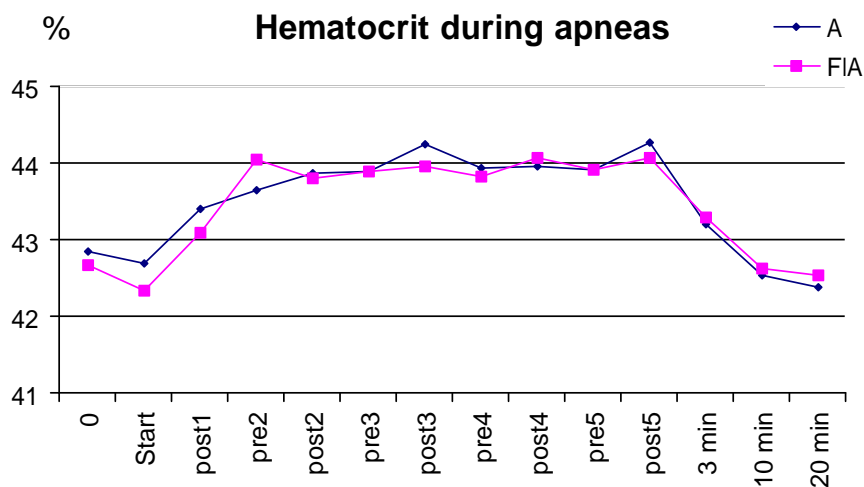


DOES FACIAL CHILLING AUGMENT THE HEMATOCRIT INCREASE SEEN AT HUMAN APNEIC DIVING?

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It has been shown that an increase in Hct and Hb accompanies apneic diving (Hurford *et al.*, 1990) or apnea with face immersion in humans (Schagatay *et al.*, submitted). This increase appears to be caused by spleen contraction, as it is not observed in splenectomized subjects (Schagatay *et al.*, submitted). It is known from the cardiovascular diving response that facial chilling increases the reductions of heart rate and skin blood flow during apnea. We focused in the present study on the neural input triggering the hematological response. Eight subjects, trained apneic divers or subjects with good breath holding ability (>2 min), volunteered for the study. The subjects rested in the prone position for 30 min before performing apneas. The subjects performed two series of five apneas of a fixed near maximal individual duration, one series in air (A) and one with facial immersion in 10°C water (FIA). Apneas of each series were spaced by 2 min resting intervals. The two series were separated by at least 20 min of rest and their order weighted. Venous blood samples were collected from a catheter inserted in the arm before tests. Hct and Hb were analysed directly with standard methods. We found a transient increase of the Hct in both apnea series. During A, Hct increased from 42.7% before apneas to 44.3% after the fifth apnea ($p < 0.05$), and had returned to baseline after 10 min (Figure). During FIA, Hct increased from 42.3 to 44.1% ($p < 0.05$; Figure). The response pattern was the same irrespective of the cold stimulus (NS; Figure). This pattern was repeated by the Hb values. We conclude that, unlike the cardiovascular diving response, the hematological response is triggered by the apnea stimulus only, thus not fortified by facial chilling.



Hurford, W.E., Hong, S.K., Park, Y.S., Ahn, D.W., Shiraki, K., Mohri, M. & Zapol, W.M. (1990) Splenic contraction during breath-hold diving in the Korean ama. *J. Appl. Physiol.* 69:932-936.

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