

**Halliwill JR, Minson CT. Cardiovagal regulation during combined hypoxic and orthostatic stress: fainters vs. nonfainters. J Appl Physiol 2005; 98:1050-56.**

Hypoxia has been shown to reduce orthostatic tolerance in some individuals. But it is not clear how the physiological response to hypoxia affects the body's ability to respond to other stresses that occur in conjunction with hypoxia. This study attempted to identify individual differences in the effect of acute hypoxia on the arterial baroreflex.

16 healthy subjects (8 women and 8 men) participated in the study on two separate days. On day 1, orthostatic tolerance was assessed with a 20 min, 60° head up tilt during both normoxia and hypoxia (breathing air and 12% O<sub>2</sub> respectively). On day 2, baroreflex control of heart rate was assessed, in supine position, using the modified Oxford Technique during both normoxia and hypoxia.

5 of the 16 subjects developed presyncopal signs or symptoms during tilted posture under hypoxia necessitating termination of the procedure. These 'fainters' had comparable hemodynamic responses to 'nonfainters' during combined hypoxic and orthostatic stress. Furthermore, baroreflex control of heart rate did not change with hypoxia in either group. There was a strong tendency for arterial saturation to fall more in the fainters than the nonfainters. Despite more pronounced desaturation, the increase in ventilation was comparable in the two groups (was not greater in the fainters). These findings were interpreted as suggestive of blunted chemoreflex control of ventilation in 'fainters'. Forearm vascular resistance significantly reduced in the 'fainters'.

It was concluded that hypoxic syncope is due to the superimposed vasodilator effects (largely occurring in the splanchnic circulation) of hypoxia on cardiovascular system and not from a hypoxia induced maladjustment in cardiovagal control of heart rate.

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**Boyo JE, Patterson JC, Thompson BT, Psychological test profiles of USAF pilots before Training vs. Type Aircraft flown. Aviat Space Environ Med 2005;76:463-68.**

The USAF flies a wide range of aircraft types to support a variety of missions, each of which places its own unique demands on the pilot that fly them. Matching pilots to the aircraft type they are best suited to fly is the goal of any flight training program.

Pilot selection in USAF for fighter (FP), bomber (BP) or airlift/tanker (AP) tracks after basic flight training is presently based on current needs of the USAF, individual pilot skills, aptitude and personal desires. This study was conducted to see whether significant psychological differences exist between FP, BP and AP using current baseline Medical Flight Screening (MFS) neuropsychological testing. If differences were found, could they be used to predict into which type of aircraft a pilot ultimately flies, in particular a fighter pilot.

Multidimensional Aptitude Battery (MAB), a broad based intelligence test and the NEO Personality Inventory-Revised (NEO-PI-R) test scores were used for 2105 pilots, before assignment to a particular aircraft. The relationship between the test results on these batteries and eventual aircraft types flown were analyzed.

The mean scores on IQ and component sections of MAB obtained by the FP were significantly higher than the AP & BP group. The (NEO-PI-R) personality test revealed FP scoring higher on conscientiousness and lower on agreeableness compared to scores obtained by AP.

Despite differences in MAB and NEO-PI-R scores, the results were not predictive about which aircraft an individual should be assigned due to wide overlap in scores. The author concluded that Full Scale IQ (FSIQ), a component of MAB test can be used as a useful adjunct, along with flight training grades and personal desires in determining a student pilot's potential for success in the multitasking environment of the fighter pilot.

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