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**The roles of orthostatic hypotension, orthostatic tachycardia, and subnormal erythrocyte volume in the pathogenesis of the chronic fatigue syndrome.**

Streeten DH, Thomas D, Bell DS.

Department of Medicine, State University of New York Health Science Center, Syracuse 13210, USA.

**BACKGROUND:** Orthostatic hypotension during upright tilt is an important physical disorder in patients with chronic fatigue syndrome. We have tested its occurrence during prolonged standing, whether it is correctable, and whether reduced circulating erythrocyte volume is present. **METHODS:** Fifteen patients were randomly selected from a large population of patients with chronic fatigue syndrome, studied, and observed for several years (by DSB). Blood pressure (BP) and heart rate (HR) measured with Dinamap every minute for 30 minutes supine and 60 minutes standing were compared with these findings in 15 healthy age- and gender-matched control subjects and later during lower body compression with military antishock trousers (MAST). Plasma catecholamines and circulating erythrocyte and plasma volumes were also measured by isotopic dilution methods. **RESULTS:** Abnormal findings in the patients included excessive orthostatic reductions in systolic ( $P < 0.001$ ) and diastolic BP ( $P < 0.001$ ) and excessive orthostatic tachycardia ( $P < 0.01$ ), together with presyncopal symptoms in 11 of the 15 patients and in none of the control subjects after standing for 60 min. Lower body compression with the MAST restored all orthostatic measurements to normal and overcame presyncopal symptoms within 10 min. Circulating erythrocyte but not plasma volumes were subnormal in the 12 women ( $P < 0.01$ ) and plasma norepinephrine concentration rose excessively after standing for 10 min. **CONCLUSION:** Delayed orthostatic hypotension and/or tachycardia caused by excessive gravitational venous pooling, which is correctable with external lower-body compression, together with subnormal circulating erythrocyte volume, are very frequent, although not invariably demonstrable, findings in moderate to severe chronic fatigue syndrome. When present, they may be involved in its pathogenesis.

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