

Vasovagal Syncope As A Manifestation Of An Evolutionary Selected Trait

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Abstract

Some observations suggest that typical (emotional or orthostatic) vasovagal syncope (VVS) is not a disease, but rather a manifestation of a non-pathological trait. We conducted an extensive bibliographic research on the vasovagal reactions in animals, including humans, in order to investigate the possible factors that may explain the origin and evolution of VVS. We found two processes which appear relevant for the investigation of VVS evolution: fear/threat bradycardia (alarm bradycardia) in animals, mainly during tonic immobility and vasovagal reflex during hemorrhagic shock (thoracic hypovolemia) both in animals and humans. The available data suggest that VVS in humans, alarm bradycardia in animals and the vasovagal reflex during hemorrhagic shock share the same physiological mechanisms and that is indicative of a common evolutionary root. However, during the vasovagal reflex loss of consciousness occurs in humans, but it is absent (or extremely rare) in animals. That can be explained as a by-product due to the erect position and the large brain evolved in our species. If the vasovagal reflex persisted for millions of years along the vertebrates evolutionary history, we can reasonably assume that it has a function and it is not harmful. It could be neutral or beneficial, but the available data suggest it is beneficial; likely, it evolved as an advantageous response to stressful and possibly dangerous heart conditions. Emotional or orthostatic vasovagal reflex is preceded by enhanced sympathetic activity, which is harmful and possibly dangerous. The transient inhibition of the sympathetic system, together with activation of the vagal tone, characterizes VVS. The consequent slowing of the heart rate induced by the vasovagal reflex may constitute a beneficial break of the cardiac pump, thereby reducing myocardial oxygen consumption. We suggest that typical VVS should be regarded as a selected response, which probably evolved in the ancient past as a defense mechanism of the organism within some ancestral group(s) of vertebrates.