HEART RATE AND BLOOD PRESSURE IN THE CONTEXT OF A NUTRITIONAL AND PSYCHOLOGICAL ANALYSIS: A CASE STUDY

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Background: The cardiovascular response to body-mind interactions can be monitored through rhythmic variation of blood pressure and pulse. This circadian variable is described primarily through its amplitude (A) and acrophase (F). The disturbance of circadian variability helps predict, among others, the occurrence of cardiovascular diseases. Circadian Hyper Amplitude Tension (CHAT) is a psychosomatic disorder related to an inappropriate lifestyle (incl. unbalanced diet, stress-inducing environment/development) and/or genetic factors. Blood pressure and heart rate are phenotypes characterized by rhythmic fluctuations in time, themselves under influence of environmental / developmental (incl. psychosocial) and genetic conditions. These cardio-/cerebro-vascular fluctuations result from otherwise largely distributed internal biological rhythms regulated via complex and intertwined neuro-hormonal systems.

Objective: To identify a potential time-structure relationship between blood pressure / heart rate rhythmic fluctuations and nutritional / psychosocial conditions in a 43-year old woman exposed to new nutritional (omega-3 fatty acids supplementation) and psychosocial (divorce) factors.

Material and Methods: The study involved the use of a modern non-invasive device (ambulatory blood pressure monitor or ABPM, A&D Ltd, Tokyo, Japan) for the continuous (24/7) monitoring of heart functions and rhythms between October 2009 and March 2010, at 30-minute intervals. As a result, 16 time-structure profiles (Sphygmochron?) were obtained from Halberg Chronobiological Center (Minneapolis, MN, USA), each of them containing detailed analysis and interpretation of stacked data spanning 7-14 days. The study also involved a diary for daily registering of nutritional (Omega-3 fatty acids) / psychosocial (PANAS) events and their emotional and cognitive components.

Results: Both SBP and DBP steadily decreased during the time of the study. Three periods of elevated variability in SBP (diagnosed as CHAT) and one period of abnormally low DBP were recorded during the 6-month study at time of negative affects (NA).

Conclusion: A comparative analysis of diary records (Omega-3 fatty acids & PANAS) and cardiovascular responses (Sphygmochron) showed that a person who is professionally and socially active in middle age can actively reduce her SBP/DBP with omega-3 fatty acids intervention, but can also display disturbances in blood pressure variability predicted by the stress-strain hypothesis, whereby states of strain and relaxation are generated by the person?s predetermined standards and objectives.