Brain-Heart (Cardiovascular) Interactions in Stress and Anxiety Related Disorders

Implications for Increased Cardiovascular Disease Risk

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1. **Introduction**
   1. Overview of paper
      * clinical/preclinical evidence for mechanisms of brain-heart interaction in stress disorders
      * neurological, psychiatric, genetic influences on autonomic dysfunction, atherosclerosis, ischemia
      * stress disorders including clinical (PD, PTSD, GAD, SAD, MDD) and allostatic load have relationship with cardiovascular risk
   2. Epidemiology studies
      * observational studies show that psychosocial stress, arousal, depression precipitate SCD (Greene, Goldstein, & Moss, 1972; Mittleman et al., 1995; Rahe, Bennett, Romo, Siltanen, & Arthur, 1973)
   3. Neurophysiology
      1. Neurocardiac axis
         * description of anatomical pathways (medullary, supramedullary, intrathoracic extracardiac ganglia, intrinsic cardiac ganglia, spinal columns) (Armour, 2008; Oppenheimer, Gelb, Girvin, & Hachinski, 1992)
         * importance of sympathetic tone through stellate ganglion for increasing risk of VF (Harris, Otero, & Bocage, 1971; Kliks, Burgess, & Abildskov, 1975; Schwartz, Verrier, & Lown, 1977), and that of vagal activity as protective (Brack, Coote, & Ng, 2011; Brack, Patel, Coote, & Ng, 2007; Coote, 2013; Kolman, Verrier, & Lown, 1975; Ng, Brack, & Coote, 2001; Rabinowitz, Verrier, & Lown, 1976)
      2. Arrhythmia studies
         * brain stimulation by chemical/electrical stimuli lead to VF (Goodman Levy, 1914; Lown, Verrier, & Rabinowitz, 1977); threshold lowered with ischemia (Kolman et al., 1975); dysrhythmia mediated potentially through catecholamines (Davis & Natelson, 1993)
         * psychological stress can also lead to fibrillation (Lown, Verrier, & Corbalan, 1973)

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