Clinical Digest

Mental Health

Job Stress and Dementia?

Job stress can do more than lead to burnout—it may raise the risk of later dementia and Alzheimer disease (AD), according to researchers from the Karolinska Institutet and Stockholm University, Stockholm, Sweden.

The researchers collected occupational data for 913 patients in the Kungsholmen Project, a longitudinal study of aging and dementia in Stockholm. To assess psychosocial stress at work, the researchers categorized job control and job demands as: (1) high job strain, with high demands and low control; (2) low job strain, with low demands and high control; (3) active job strain, combining high demands and control; and (4) passive job strain, combining low demands and control. They examined the association of vascular disease with job strain and dementia separately.

Over a median 5.4 years of follow-up, 260 participants developed dementia; 197 were diagnosed with AD. They tended to be older, female, and had depressive symptoms. They also were less educated with low job demands and low job control. They did not differ, though, in vascular disease and support at work.

High job strain (high demands, low control) and passive job strain (low demands, low control) both doubled the risk of dementia, even after the researchers adjusted for depressive symptoms and vascular disease. The findings support the hypothesis that job stress increases the risk of dementia through stress rather than vascular mechanisms. Acute stress increases cortisol secretion, which may damage the hippocampus, the first brain center affected by stress hormones.

The combination of low demands and low control can also be harmful through understimulation, the researchers suggest. Chronic adaptation to a boring job can reduce the individual's ability to solve problems and tackle challenges; lack of stimulation can reduce neural communication. When the researchers adjusted for work complexity, the risk effect of passive job strain was weakened, suggesting that even low-control jobs can boost brain activity if the job is complex.

Source: Wang H-X, Wahlberg M, Karp A, Winblad B, Fratiglioni L. *Alzheimers Dement.* 2012;8(2):114-120. doi:10.1016/j.jalz.2011.03.001.

Metabolic Diseases

Stress Hyperglycemia

Stress hyperglycemia (SH) is common but not well understood. Some studies have found it does and others have found that it does not increase mortality. But it may be that modest hyperglycemia is not harmful to critically ill patients with sepsis and might even have some protective benefits, say researchers from the Frankston Hospital, Frankston; Monash University, Churchill; and University of Melbourne, Melbourne, all in Australia.

They collected data on 297 patients admitted with sepsis over a 5-year period. Of those, 204 developed SH. The mean blood glucose level in patients with SH was 8.7 mmol/L, compared with 5.9 mmol/L in those without SH. The current study used average blood glucose levels throughout the intensive care unit (ICU) stay "because physiologic stress is an ongoing process during acute critical illness and is not just limited to the first 24 hours of the illness," the researchers point out.

Of 93 patients with blood glucose levels of 6.9 mmol/L or below, 25 (27%) died in the ICU and 19 (34%) died in the hospital. Of the 204 patients with levels above 6.9 mmol/L, 30 (15%) died in the ICU and 36 (29%) died in the hospital. The patients with higher levels had longer ICU and hospital stays. The higher death rate but shorter length of stay among the non-SH patients may reflect that they died earlier in their ICU stay—despite comparable comorbidities, vital signs, organ failures, and APACHE III and SAPS 2 scores at the time of admission.

Although SH seemed to offer some protection, the reason wasn't clear. They theorize that the level of hyperglycemia may be key: Modest hyperglycemia during stress may be beneficial by promoting cellular glucose uptake, while severe hyperglycemia is associated with complications, including organ dysfunction. Further, if the delivery of oxygen to the cells is impaired in septic shock, the delivery of glucose may also be impaired, and a higher glucose concentration gradient may be needed to shift glucose into the cells.

Findings from a substudy revealed that SH was also associated with reduced mortality for patients with cardiovascular comorbidities. Again the reason was unclear, but the researchers say although hyperglycemia increases mortality among patients with acute myocardial infarction, it may not be harmful in patients with hypertension, congestive cardiac failure, hypercholesterolemia, or stable coronary artery disease.

Source: Tiruvoipati R, Chiezey B, Lewis D, et al. *J Crit Care.* 2012;27(2):153-158. doi:10.1016/j.jcrc.2011.06.011.

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