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Differences in Inflammatory Response to Endotoxin in Older Adults by Sex

Inflammation has been implicated in autoimmune diseases such as cancer, Alzheimer's Disease, and Lupus, with significantly greater prevalence in women than men. As part of Dr. Michael Irwin's Sleep Health Aging Research in Depression (SHARE D), the inflammatory response due to an endotoxin was studied in older adults. Eighty three healthy adults (60 to 80 years) were stratified by sex and randomized to receive either low dose endotoxin (0.8 N per kg body weight) or placebo (same volume of 0.9 percent saline). After injection, blood was drawn hourly for the next 10 hours to assess levels of inflammatory cytokines. We hypothesized that females would show a greater response to the endotoxin than males. In the study, women had a significantly higher peak and a quicker return to baseline levels of both IL 6 and TNF alpha compared to men. The results of this study indicate that sex of the individual affects severity of inflammatory response to endotoxin in older adults, with evidence of a greater inflammatory response in women. This contradicts results of a similar study that found no significant sex difference in inflammatory markers for younger adults treated with endotoxin, suggesting that the higher incidence of inflammatory diseases in women does not stem from levels of reproductive hormones, but rather from sex differences in the immune inflammatory response. Looking into inflammation inducing stressors in a woman's life may provide greater insight as to why women are more susceptible to inflammatory diseases.