



## Sleep Duration Associated With Variations In Levels Of Inflammatory Markers In Women

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A study in the July 1 issue of the journal *SLEEP* demonstrates that levels of inflammatory markers varied significantly with self-reported sleep duration in women but not men.

The study found that both interleukin-6 (IL-6) and high-sensitivity C-reactive protein (hs-CRP) levels varied with sleep duration in women following multiple adjustments for a number of confounding factors. Compared with women who reported sleeping seven hours on an average weekday, IL-6 levels were significantly lower in women who reported sleeping eight hours. Levels of hs-CRP were significantly higher in women who reported sleeping 5 hours or less. In contrast, adjusted results show no significant variations in inflammatory markers with sleep duration in men.

The study reports that hs-CRP, a nonspecific marker of acute-phase inflammatory response, is predictive of future cardiovascular morbidity, and the relationship of IL-6 to coronary heart disease is similar to that of CRP.

According to lead author Michelle A Miller, PhD, associate professor (reader) of biochemical medicine at the University of Warwick Medical School in the U.K., short-term sleep deprivation studies have shown that inflammatory markers are elevated in sleep-deprived individuals, suggesting that inflammatory mechanisms may play a role in the cardiovascular risk associated with sleep deprivation.

"Our study may provide some insight into a potential mechanism for the observation in previous studies which indicates an increased risk of death from cardiovascular disease in individuals who have less than five hours sleep per night and increased risk of non-cardiovascular death in long sleepers," said Miller.

Results indicate that participants of both sexes sleeping five hours or less had a poorer health status and lifestyle profile. This was particularly evident in males. Men sleeping five hours or less were more likely to be in the lowest employment grade, to be unmarried, to have a higher body mass index and waist circumference, to have lower mental and physical health scores, to smoke and have a higher diastolic blood pressure. Women were more likely to be unmarried, have lower physical health scores, to smoke and have higher systolic blood pressure. Men and women sleeping nine hours or more were also more likely to have decreased physical health scores.

The study involved more than 4,600 White participants from the University College London based Whitehall II cohort study; 73 percent were men. Participants between the ages of 35 and 55 years were recruited between 1985 and 1988 from 20 London-based civil service departments. Data for this study is from the phase 3 follow-up (1991-1993). Sleep duration was determined by subjective questionnaires, and general health was assessed during a screening examination.

According to the authors, these findings add to the growing body of evidence which suggests that there is a non-linear relationship between cardiovascular risk factors and duration of sleep. Furthermore, they support the idea that short sleep is associated with an increase in cardiovascular risk and that the association between sleep duration and cardiovascular risk is markedly different in men and women. Further prospective studies are required to ascertain causality but the results also are consistent with the idea that sleeping seven or eight hours per night appears to be optimal for health.

The study: "Gender Differences in the Cross-Sectional Relationships Between Sleep Duration and Markers of Inflammation: Whitehall II Study"

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