

Hair provides proof of the link between chronic stress and heart attack

September 3 2010

Researchers at The University of Western Ontario have provided the first direct evidence using a biological marker, to show chronic stress plays an important role in heart attacks. Stressors such as job, marital and financial problems have been linked to the increased risk for developing cardiovascular disease including heart attack. But there hasn't been a biological marker to measure chronic stress. Drs. Gideon Koren and Stan Van Uum developed a method to measure cortisol levels in hair providing an accurate assessment of stress levels in the months prior to an acute event such as a heart attack. The research is published on-line in the journal *Stress*.

Cortisol is considered to be a stress hormone. Its secretion is increased during times of stress. Traditionally it's been measured in serum, urine and [saliva](#), but that only shows stress at the time of measurement, not over longer periods of time. Cortisol is also captured in the hair shaft.

"Intuitively we know stress is not good for you, but it's not easy to measure," explains Dr. Koren, who holds the Ivey Chair in Molecular Toxicology at Western's Schulich School of Medicine & Dentistry. "We know that on average, hair grows one centimetre (cm) a month, and so if we take a hair sample six cm long, we can determine stress levels for six months by measuring the cortisol level in the hair."

In the study, hair samples three cm long were collected from 56 male adults who were admitted to the Meir Medical Centre in Kfar-Saba, Israel suffering heart attacks. A control group, made up of 56 male

patients who were hospitalized for reasons other than a [heart attack](#), was also asked for hair samples. Higher hair [cortisol levels](#) corresponding to the previous three months were found in the heart attack patients compared to the control group.

The prevalence of diabetes, hypertension, smoking and family history of coronary artery disease did not differ significantly between the two groups, although the heart attack group had more cholesterol problems. After accounting for the known risk factors, hair cortisol content emerged as the strongest predictor of heart attack.

"Stress is a serious part of modern life affecting many areas of health and life," says Dr. Koren. "This study has implications for research and for practice, as stress can be managed with lifestyle changes and psychotherapy."

Provided by University of Western Ontario

Citation: Hair provides proof of the link between chronic stress and heart attack (2010, September 3) retrieved 4 May 2024 from <https://medicalxpress.com/news/2010-09-hair-proof-link-chronic-stress.html>

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