

## Study says back pain may be in your genes

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What do you learn by looking at the spines of hundreds of Finnish twins? If you are the international team of researchers behind the Twin Spine Study, you find compelling proof that back pain problems may be more a matter of genetics than physical strain.

The findings of the Twin Spine Study, an ongoing research program started in 1991, have led to a dramatic paradigm shift in the way disc degeneration is understood. Last month a paper presenting an overview of the Twin Spine Study's multidisciplinary investigation into the root causes of disc degeneration received a Kappa Delta Award from the American Academy of Orthopaedic Surgeons, arguably the most prestigious annual award in musculoskeletal research.

"In the past, the factors most commonly suspected of accelerating degenerative changes in the discs were various occupational physical loading conditions, such as handling of heavy materials, postural loading and vehicular vibration," said lead researcher Michele Crites-Battié of the University of Alberta's Faculty of Rehabilitation Medicine.

Drawing on information from 600 participants in the population-based Finnish Twin Cohort—147 pairs of identical and 153 pairs of fraternal male twins—the Twin Spine Study has turned the dominant "injury model" approach to disc degeneration on its head.

Researchers from Canada, Finland, the United States and the United Kingdom compared identical twin siblings who differed greatly in their exposure to a suspected risk factor for back problems; for example, one



of the twins had a sedentary job while the other had heavy occupational physical demands, or one routinely engaged in occupational driving while the other did not. The studies yielded startling results, suggesting that genetics play a much larger role in disc degeneration than previously thought.

Despite extraordinary differences between identical twin siblings in occupational and leisure-time physical loading conditions throughout adulthood, surprisingly little effect on disc degeneration was observed. The findings indicated that while physical loading—handling heavy loads, bending, twisting and static work in awkward postures—appears to influence disc degeneration, the effects are very modest. During the course of the exposure-discordant twin studies, said Crites-Battié, the observation that struck anyone who viewed the twin sibling images sideby-side was the strong resemblance in disc degeneration, not only in the degree of degeneration, but also in the types of findings and spinal levels involved.

The Twin Spine Study is far from over: having found evidence that genetics may play an overlooked role in disc degeneration, the team of North American and European is now working to identify the specific genes and biological mechanisms influencing disc degeneration and back pain problems; understanding how degeneration progresses over time; and differentiating normal, inconsequential changes from degenerative changes that lead to pain.

"This advance in the understanding of disc degeneration provides a foundation from which to develop new hypotheses and more fruitful research that may help shed light on one of the most common and costly musculoskeletal conditions facing the developed countries of the world," said Crites-Battié.

Source: University of Alberta



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