Twin study lends new insights into link between back pain and depression

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Genetic factors help to explain the commonly found association between low back pain and depression, suggests a large study of twins in the March issue of *PAIN*, the official publication of the International Association for the Study of Pain.

Genetic factors affecting both conditions may be involved in the association between back pain and depression, according to the report by Marina B. Pinheiro, MSc, and colleagues of The University of Sydney, Australia, and Murcia Twin Registry, Spain.

Twin Data Used to Explore Link between Back Pain and Depression

The researchers analyzed data from an established database (Murcia Twin Registry) of nearly 2,150 Spanish twins. Twin studies provide a unique opportunity to elucidate the association between health conditions, by eliminating the genetic and environmental factors contributing to them.

Questionnaire responses were analyzed to determine whether participants with symptoms of depression had higher prevalence of back pain. A series of statistical analyses were then performed to clarify the contributions of genetic factors and early shared environment to the depression-back pain link.

The results showed a significant association between symptoms of depression and low back pain. On initial analysis considering the participants as individuals, rather than twins—and therefore not accounting for genetic and familial factors—the odds of having back pain were about 1.6 higher for those with symptoms of depression and anxiety.

On analysis of twin pairs—which controls for genetic and familial factors that could influence the relationship between depression and back pain—the relationship remained significant, with a 1.7 increase in odds. The association was even stronger—more than a 2.3 increase in odds of low back pain associated with depression and anxiety—on analysis of dizygotic (non-identical) twins, who share half their genes.

Genetic Factors Are 'Main Confounder' of Depression/Back Pain Link

On further analysis of monozygotic twins—who are genetically identical—the association between symptoms of depression and low back pain disappeared. This suggested that the strong association found in non-identical twins resulted from the "confounding" effects of common genetic factors influencing both conditions. For example, genes affecting levels of neurotransmitters such as serotonin and norepinephrine might affect the risk of both conditions.

Previous studies have shown a "consistent relationship" between back pain and depression—a combination that may complicate diagnosis and treatment. However, the nature of the association remains unclear. The new study is the first to examine the relationship between depression and low back pain using twin data to control for genetic and familial factors.

The finding that the association disappears after fully adjusting for genetics and familial confounders in identical twins suggests that

"genetics is the main confounder" of the relationship between depression and back pain. Thus the commonly found association between these health conditions is probably not a true relationship, as there are other factors influencing it.

However, "It still remains unclear whether common genetic factors predispose people to develop both low back pain and depression," Pinheiro and coauthors write. Further studies in which participants are followed up over time—preferably twins—are needed to confirm the findings. The authors also suggest that the link between anxiety and back pain warrants further study.

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