Lumbar disc degeneration more likely in overweight and obese adults

January 30 2012

One of the largest studies to investigate lumbar spine disc degeneration found that adults who are overweight or obese were significantly more likely to have disc degeneration than those with a normal body mass index (BMI). Assessments using magnetic resonance imaging (MRI) show elevated BMI is associated with an increased number of levels of degenerated disks and greater severity of disc degeneration, including narrowing of the disc space. Details of this study now appear in *Arthritis & Rheumatism*, a journal published by Wiley-Blackwell on behalf of the American College of Rheumatology (ACR).

The World Health Organization (WHO) reports that obesity—one of the most preventable risk factors for a number of diseases—has more than doubled since 1980. According to WHO, in 2008 roughly 1.5 billion people aged 20 and older were overweight, with more than 200 million men and close to 300 million women considered obese. In the U.S., studies estimate one in three children is overweight or obese and excess weight could lead to more severe obesity in adulthood.

Moreover, previous research has linked higher BMI to low back pain, which is often debilitating and can limit function, impact psychological well being, diminish overall quality of life, and is associated with substantial socioeconomic and health-care costs. Experts suggest that disc degeneration is one cause of low back pain, and therefore, BMI could be involved in the development of degenerative disc disease. To expand the knowledge of this important health concern, a team of researchers led by Drs. Dino Samartzis and Kenneth M.C. Cheung at the

University of Hong Kong in Hong Kong investigated the association between elevated BMI and presence, extent, and severity of lumbar spine disc degeneration on MRI in adults.

The team recruited 2,599 participants aged 21 and older from Southern China between 2001 and 2009. Participants were from diverse social and economic backgrounds and were recruited regardless of whether they had lower back pain or not. The study group included 1,040 men and 1,559 women who had a mean age of 42 years. Researchers conducted radiographic and clinical assessments, and MRIs of the lumbar spine were obtained for all subjects.

Study findings reveal that 73% of participants displayed disc degeneration, with men (76%) having a significantly higher prevalence of degeneration than women (71%). Not surprisingly, increasing age was found to increase the prevalence of disc degeneration. BMI assessments of the study group show that 7% of subjects were underweight, 48% were in the normal weight range, 36% were overweight, and 9% were obese.

"Our research confirms that with elevated BMI there is a significant increase in the extent and global severity of disc degeneration. In fact, end-stage disc degeneration with narrowing of the disc space was more pronounced in obese individuals," said Dr. Samartzis. The authors suggest that with weight gain, physical loading on the disc and/or a chronic low-grade inflammation from the fat cells may play a role in disc degeneration. Dr. Samartzis further added that "Since overweight and obesity are worldwide concerns whose prevalence continues to rise, our study's findings have considerable public health implications. If these issues continue to plague society, they can further affect spine health leading to low back pain and its consequences."

The authors note that disc degeneration is a complex process involving

structural and chemical changes of the disc. They recommend that future studies that investigate risk factors for disc degeneration should take into account the impact of overweight and obesity on the disease. Dr. Cheung concludes, "Deeper understanding of how elevated BMI contributes to disc degeneration and low back pain could aid in the development of novel interventions that can improve quality of life for those with these disabling conditions."

More information: "The Association of Lumbar Intervertebral Disc Degeneration on MRI in Overweight and Obese Adults: A Population-Based Study." Dino Samartzis, Jaro Karppinen, Danny Chan, Keith D.K. Luk and Kenneth M.C. Cheung. *Arthritis & Rheumatism*; Published Online: January 30, 2012 (DOI: 10.1002/art.33462).

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