Medical Xpress

Genetic factors in smoking also increase risk of chronic bronchitis

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Smoking is a known risk factor for respiratory diseases like chronic bronchitis, but genes also play a significant role in its development, according to researchers in Sweden, who studied more than 40,000 Swedish twins to determine the extent to which behavior, environment and genes each play a role ion the development of chronic bronchitis.

"[S]moking behavior has a known genetic component and smoking is a primary risk factor for chronic bronchitis," wrote Jenny Hallberg, of the Department of Public Health Sciences at Karolinska Institutet in Stockholm. Hereditability accounted for 40 percent of the risk for chronic bronchitis, but, interestingly, 14 percent of the genetic risk was also linked to a genetic predisposition to smoke, whether or not the individual actually smoked. Chronic bronchitis along with emphysema account for most cases of chronic obstructive pulmonary disease, or COPD.

The research was published in the first issue for March of the *American Journal of Respiratory and Critical Care Medicine*, published by the American Thoracic Society.

The researchers analyzed data from the Screening Across Lifespan Twin (SALT) study in Sweden, which surveyed all known living twins in Sweden born in 1958 or earlier. The survey included questions on zygosity—whether the twins shared 100 or 50 percent of their genetic material—smoking history and a checklist of common diseases. The interview asked specific screening questions designed to determine

whether the interviewee had chronic bronchitis.

The investigators used the survey data and statistical modeling to tease apart the genetic and environmental influences that comprise an individual's risk of developing chronic bronchitis: genetic factors, shared environmental factors (i.e., experienced by both twins) and non-shared environmental factors.

"[This] study on the population-based Swedish Twin Registry, showing a genetic effect for the development of chronic bronchitis that does not differ by sex is the first to our knowledge to quantify heritability of the disease," she said.

Because chronic bronchitis had previously been reported to be more prevalent in women than men, the results pointed to a number of intriguing possibilities. "It is possible that women are more prone to report symptoms," remarked Dr. Hallberg. "Or, more likely, this could be an effect of smoking being more harmful for women due to their smaller lungs from start (exposure to cigarette smoke relative to body size)."

Dr. Hallberg cautioned that the finding that the genetic factors that contribute to chronic bronchitis were largely independent of those that contribute to smoking should not be interpreted to mean that smoking has no effect on chronic bronchitis. "Although there was some genetic interplay, it is safe to say that smoking itself, and not the genes that predispose one to smoking, is a larger risk factor in developing chronic bronchitis of environmental exposures—- primarily smoking—- than genetic predisposition. This is true of both men and women," said Dr. Hallberg.

The investigators are currently working on a clinical follow-up study that is relating clinical measures of lung function to obstruction. "We believe

that it is important to also include testing of lung function to disentangle whether there are genetic differences by sex," said Dr. Hallberg. "There is also data in the literature that social factors have different importance for smoking behavior in men and women. We know much less regarding the genetic influences."

Source: American Thoracic Society