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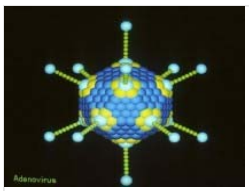

Computer graphic of an Adenovirus
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A common cold virus may contribute to obesity

By Donna Marykwas, Science News Examiner
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A new epidemiological study published in *Pediatrics*, the official journal of the American Academy of Pediatrics, adds to a body of emerging evidence that there is a statistically significant correlation between exposure to adenovirus and incidence and degree of obesity.

Adenoviruses are DNA viruses that can cause upper respiratory tract infections (the common cold) and enteritis (inflammation of the small intestine.) There are over 50 different types of human adenovirus. Adenovirus serotype 36 (AD36) is the only human adenovirus believed to be associated with human obesity.

This study tested 124 children ranging in age from 8.3 - 18.0 years old, 54% being obese. Exposure to AD36 was determined based on the presence of virus-neutralizing antibodies in the patients' blood sera.

Of the 124 children, 19 tested positive for the presence of antibodies to this virus. Most (78%) of the AD36-positive children were obese. Evidence of exposure to this virus was 3 times more frequent among the total obese population compared to the frequency of AD36-positivity in the non-obese children. Furthermore, the obese children in this study that were AD36-positive weighed on average 35.5 pounds more than the obese children that tested negative for this virus.

Epidemiologists look at populations to identify patterns that characterize and distinguish healthy or sick people with respect to a particular disease or clinical syndrome. Epidemiology is largely an observational science rather than an experimental science.

However, previously published experiments performed on animal models (chickens, rodents and nonhuman primates) demonstrated that infection with AD36 induced obesity, the accumulation of body fat, even though the animals ate no more food nor exercised less than the non-obese animals not infected with the virus. (See references 9 - 12 cited in the new study.)

Other studies on adult human stem cells suggest a possible mechanism for this adenovirus-induced obesity. Infected stem cells showed increased differentiation into adipose cells and stored more lipid fats

than non-infected cells. Glucose sugar metabolism and enhanced insulin sensitivity were also suggested (See references 19 - 22 cited in the new study.)

While the new study and main subject of this report is an epidemiological study, it is one of a growing number of studies (described in the article's discussion) that support a relationship between obesity and the presence of virus-specific neutralizing antibodies. The data are statistically significant. However, further studies are necessary to determine if the consequences of adenovirus 36 exposure are the cause of obesity in the child patients tested and other obese children or if childhood obesity renders these children more susceptible to infection.

Most cases of the common cold are caused by other viral species, Rhinoviruses and Coronaviruses. So parents, please don't panic if your child develops a cold. It is inevitable considering the existence of literally hundreds of serotypes of cold-causing viruses.

Childhood obesity is on the rise. Many people are quick to assume that parents of obese children are to blame in allowing their children to overeat and not exercise. Maybe this is true in some cases, but this may not be the only possibility.

REFERENCE

Charles Gabbert, Michael Donohue, John Arnold and Jeffrey B. Schwimmer. 2010. Adenovirus 36 and obesity in children and adolescents. Pediatrics. Published online (www.pediatrics.org) September 20, 2010.

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