

Virus Might Contribute to Obesity

Source: <http://sci.tech-archive.net/Archive/sci.med.diseases.lyme/2005-04/msg00885.html>

- *From:* "georgia" <jwissmille@xxxxxxx>
 - *Date:* 13 Apr 2005 12:58:37 -0700
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Friday July 28, 2000 10:17 AM ET
Virus Might Contribute to Obesity

By Amy Norton

NEW YORK (Reuters Health) – Poor eating habits, sedentary lifestyles, and genes have all been implicated as contributors to obesity. Now researchers have evidence that suggests another possibility—that a virus may trigger fat accumulation in some people.

In experiments with chickens and mice, researchers found that a virus known as human adenovirus-36 (Ad-36) caused the animals to gain excessive amounts of fat. In contrast, chickens infected with a bird adenovirus called CELO did not pack on excess fat.

While these results do not point to Ad-36 as a cause of human obesity, they do suggest that one or more viruses may be behind some people's weight woes, Dr. Nikhil V. Dhurandhar told Reuters Health.

In general, adenoviruses cause colds, diarrhea and eye infections, but little is known about how Ad-36 is spread or the types of infections it might cause. The researchers settled on Ad-36 because it does not cross-react with other adenoviruses, meaning it likely has "unique qualities," Dhurandhar said. And, he said, no one has else has studied it.

Dhurandhar, of Wayne State University in Detroit, Michigan and his colleagues report their findings in the August issue of the International Journal of Obesity.

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The idea that a virus may trigger obesity is not new to the animal world. Four viruses have been shown to cause fat accumulation in animals, Dhurandhar noted. "This," he said, "is the first time a human virus has been associated with obesity."

Dhurandhar came across his first circumstantial evidence of a viral cause for human obesity in his native India. He and his colleagues discovered that a chicken adenovirus isolated in Bombay caused chickens to accumulate fat. Surprisingly, the virus also lowered the animals' cholesterol levels. Dhurandhar's team next looked for evidence of infection with the chicken virus in a group of 52 obese people. The researchers found that 10 showed signs of infection. More importantly, these people were the most obese, yet had lower cholesterol than those who were not infected with the chicken adenovirus.

Because the US would not allow Dhurandhar to import the Bombay chicken virus for study, he and his colleagues decided to investigate whether a human virus might be involved in fat accumulation.

In four separate experiments, Dhurandhar's team found that the animals infected with Ad-36 packed on fat, but showed "paradoxically low" cholesterol levels. Why this happened is unclear. Damage to the areas of the brain that control calorie use is a possibility, but Dhurandhar and his colleagues found no evidence of that in these experiments.

Much more study is needed to determine whether obesity is indeed an infectious disease. It may be that in some cases, Ad-36 or another virus interacts with obesity-linked genes or poor diet. Or, Dhurandhar said, it's possible that a virus alone leads to obesity in some people. "We see it in animals," he noted.

What's important, according to Dhurandhar, is that scientists recognize the possibility that infectious organisms could play a role—just as they are thought to do in ulcers and heart disease.

"Even if just 10% of obesity cases have a viral contribution," he said, "we should go after it."

SOURCE: International Journal of Obesity 2000;24:989-996.

New human virus tied to obesity
Ben Harder

>>From San Diego, at Nutrition Week

Researchers have identified the second member of a class of human viruses that may increase people's susceptibility to obesity. Previous studies have shown that people and lab animals infected with a virus known as human adenovirus-36, or Ad-36, are more likely to be obese than are uninfected individuals. A new study finds that a closely related adenovirus from people causes excess fat to accumulate in chickens infected with the virus.

Richard L. Atkinson of the University of Wisconsin-Madison and his colleagues sprayed human adenoviruses Ad-2, Ad-31, and Ad-37 into the nasal passages of young chicks to test for the effects they had seen with Ad-36.

Four weeks later, chicks infected with Ad-37 had an average of 6 grams of fat stored around internal organs, compared with about 2 g for chicks infected with Ad-2 or Ad-31 or chicks free of adenoviruses. All chicks received similar diets, and overall body weights weren't significantly different among the groups. Atkinson says that physiological measurements hint at multiple mechanisms, still unknown, underlying the viruses' role in fat accumulation.

References:

Atkinson, R.L., et al. 2002. Evaluation of human viruses as an etiology of obesity in chickens (Abstract 133). Nutrition Week. Feb. 23-27. San Diego.

Further Readings:

For information about Nutrition Week, see
<http://www.nutritionweek.com/>.

Sources:

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>>From Science News, Vol. 161, No. 11, March 16, 2002, p. 173.

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