Human adenovirus Ad-36 promotes weight gain in male rhesus and marmoset monkeys.

Abstract

Although obesity has multiple etiologies, an overlooked possibility is an infectious origin. We previously identified two viruses, SMAM-1, an avian adenovirus (Ad), and Ad-36, a human adenovirus, that produce a syndrome of visceral obesity, with paradoxically decreased serum cholesterol and triglycerides in chickens and mice. In the two studies presented in this paper, we used nonhuman primates to investigate the adiposity-promoting potential of Ad-36. In study 1, we observed spontaneously occurring Ad-36 antibodies in 15 male rhesus monkeys, and a significant longitudinal association of positive antibody status with weight gain and plasma cholesterol lowering during the 18 mo after viral antibody appearance. In study 2, which was a randomized controlled experiment, three male marmosets inoculated with Ad-36 had a threefold body weight gain, a greater fat gain and lower serum cholesterol relative to baseline (P <0.05) than three uninfected controls at 28 wk postinoculation. These studies illustrate that the adiposity-promoting effect of Ad-36 occurs in two nonhuman primate species and demonstrates the usefulness of nonhuman primates for further evaluation of Ad-36-induced adiposity.