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Human adenovirus 36 and weight gain in a rat model

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Background: Obesity is defined as an excessive fat accumulation in adipose tissue that may associated with increased chronic disease. The global prevalence of obesity has steadily increased over the past three decades and predicted 51% of the world's population will be obese by 2030. Obesity is a multifactorial disease results from complex interactions among genetic, metabolic, behavioral, as well as environmental factors. Recent evidence have shown a positive correlation between obesity and viral infections with a particular emphasis to the human adenovirus-36 (Ad-36) that has a direct effect on adipose tissue. Ad-36 may be associated with obesity in animals and humans, although results were not consistent across all studies. The present study was conducted to examine the relationship between adenovirus-36 infection and obesity in a rat model.

Material/methods: Eight-week-old male Wistar rats were used for the experiment. Their weight were 170-240 gram (g). After one-week acclimatization period, rats were randomly divided into two groups, infected group (48 Rats) and control group (12 Rats). The rats in infection group were infected with human adenovirus Ad-36 that was obtained from American Type Culture Collection (ATCC). The rats were given free access to a normal chow diet and water and were weighed weekly.

Results: At the beginning of study, the mean and standard deviation (SD) of body weight was 192.8 ± 16.3 g and 195.3 ± 9.0 g, in infected and control groups, respectively. At the time of infection, the mean body weights were 229.0 ± 25.9 g and 232.3 ± 16.6 g for the infected and the control groups, respectively. At 12 weeks post-infection, the mean body weight of the infected rats (304.0 ± 39.0 g)

was higher than the control group (301.0 ± 36.5 g). In addition, the mean change in body weight were greater in infected group than control group (75.8 ± 27.9 g vs. 70.8 ± 24.5 g); however, no significant differences were found between two groups.

Conclusions: In summary, we did not find a statistically significant association between weight gain and Ad-36 infection in rat model. It seems that longer follow-up duration is needed to develop significant weight gain in Ad-36 infected rats.