Infections due to various pathogens can lead to overweight and obesity: Adenovirus 36 and obesity

Ingrid Schusterova [1,2], Alzbeta Tohatyova [1] and Jan Kiraly [3]
[1]P.J.Safarik University, Slovakia
[2]Eastern Heart Institute, Slovakia
[3]Veterinary University, Slovakia

Introduction: Ad36 is the first human adenovirus reported that causes obesity in experimentally infected animals and shows association with obesity in humans. More human studies, all over the world, are related to the relationship between Ad36 infection and obesity, and till now have not been explanatory, studies show contradictory results.

Aim: The aim of our study is to assess the association between Ad36 infection and obesity in high-school students from Eastern Slovakia.

Methods: Two hundred and twenty-four randomly selected students (17.72 ± 1.20 years of age, 120 female) from 7 high-schools in Kosice were included in the study. Subjects with secondary causes of obesity were excluded and none were taking medications or had a history of cardiovascular disease. In 224 healthy students, anthropometric parameters, fasting plasma glucose and insulin were measured. Ad36 antibody was detected by ELISA test.

Results: Serum leptin levels were significantly lower in presence of Ad36 seropositivity ($p<0.05$, $U=3886.00$). UA levels were significantly higher in Adv36 seropositive adolescents (318.79 ± 71.51) compared to seronegative (298.45 ± 63.05) ($p<0.05$). No significant differences were found between lean and overweight/obese adolescents in prevalence of Adv36 seropositivity (chí-kv: 0.60, $p=0.43$). Body weight were significantly higher in Adv36 seropositive lean subjects compared to Adv36 seronegative lean study group ($p<0.05$, $U=2221.50$).

Conclusion: The current study suggests that Adv36 seropositivity seems to be directly associated with decreased of leptin levels and development of unhealthy obesity and cardiovascular (CV) risk, which may be amplified by UA. Our study shows a possible association between Ad36 infection and the risk of development of obesity in normal weight children and adolescents. Further studies in different age groups of children and adults are required to elucidate this biological mechanism of such complex relationship.

e: petra@dodo.sk