

# Potential association of obesity with *IL6 G-174C* polymorphism and TTV infections

Research Article

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Received 08 June 2012; Accepted 04 March 2013

**Abstract:** Polymorphisms in *IL6*, *ACE* and *AT1R* genes are associated with obesity. Torque Teno virus (TTV) seems to be able to interfere with production of some proinflammatory cytokines associated with obesity and related phenotypes. The aim of this study was to test the potential association between obesity, TTV infection and the *IL6 G-174C* (*rs1800795*), *ACE I/D* (*rs4646994*), *AT1R A1166C* (*rs5186*) polymorphisms. The polymorphisms and the presence of TTV were detected in blood samples from 150 obese and 150 normal-weight, healthy subjects using PCR based methods. *IL6 -174 CC* genotype was more frequent in all obese patients ( $P=0.02$ ) and in patients without TTV infections ( $P=0.03$ ) than in controls. Obese women had more frequent TTV infections compared with normal-weight women ( $P=0.046$ ). Obese subjects, regardless of gender (women  $P=0.03$ , men  $P=0.04$ ), and healthy normal-weight men ( $P<0.01$ ) carriers of *AT1R C* allele had higher triglycerides levels compared with non-carriers. The frequency of TTV in the control group (70.67%) was similar to data reported in other populations. The present study indicated that *IL6 -174 CC* genotype and TTV infections in women could be associated with the common form of obesity.

**Keywords:** Obesity • *IL6* • *ACE* • *AT1R* • Polymorphisms • TTV

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## 1. Introduction

Obesity is the result of complex molecular networks and an obesogenic environment which predispose to an inflammatory state. Evidence for infectobesity, a relatively new pathophysiological mechanism for obesity [1], is supported by the phagocytic and microbicidal activity of the preadipocytes [2] and the association of disease with seasonality of birth (Winter - Spring), infections in early life [3,4], or exposure to some viral infections [5].

Torque Teno virus (TTV or TT virus) has a small single-stranded circular DNA [6]. It is ubiquitously distributed in the body and biological products of

infected subjects [7]. The disease-inducing potential of TTV is still questioned although active infection may increase the severity of some inflammatory diseases. There are no reports regarding association between human obesity and TTV in literature.

Interleukin 6 (IL6) is produced by adipose tissue among other cell types (e.g. hepatocyte, lymphocyte, endothelial cells). Genetic polymorphisms and plasma levels of IL6 have complex [8] and contradictory [9] relations with obesity [10-12], BMI (Body Mass Index) [13-15] and inflammation [16].

The renin angiotensin system (RAS) components have been detected in human preadipocytes [17] and

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