Mitochondrial Haplogroup T Is Associated with Obesity in Austrian Juveniles and Adults.

Abstract:
Recent publications have reported contradictory data regarding mitochondrial DNA (mtDNA) variation and its association with body mass index. The aim of the present study was to compare the frequencies of mtDNA haplogroups as well as control region (CR) polymorphisms of obese juveniles (n = 248) and obese adults (n = 1003) versus normal weight controls (njuvenile = 266, nadults = 595) in a well-defined, ethnically homogenous, age-matched comparative cohort of Austrian Caucasians. Using SNP analysis and DNA sequencing, we identified the nine major European mitochondrial haplogroups and CR polymorphisms. Of these, only the T haplogroup frequency was increased in the juvenile obese cohort versus the control subjects [11.7% in obese vs. 6.4% in controls], although statistical significance was lost after adjustment for sex and age. Similar data were observed in a local adult cohort, in which haplogroup T was found at a significantly higher frequency in the overweight and obese subjects than in the normal weight group [9.7% vs. 6.2%, p = 0.012, adjusted for sex and age]. When all obese subjects were considered together, the difference in the frequency of haplogroup T was even more clearly seen [10.1% vs. 6.3%, p = 0.002, OR (95% CI) 1.71]
(1.2-2.4), adjusted for sex and age]. The frequencies of the T haplogroup-linked CR polymorphisms C16294T and the C16296T were found to be elevated in both the juvenile and the adult obese cohort compared to the controls. Nevertheless, no mtDNA haplogroup or CR polymorphism was robustly associated with any of several investigated metabolic and cardiovascular parameters (e.g., blood pressure, blood glucose concentration, triglycerides, cholesterol) in all obese subjects. By investigation of this large ethnically and geographically homogenous cohort of Middle European Caucasians, only mtDNA haplogroup T was identified as an obesity risk factor.

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