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BMI Concordance in an Emirati population: a study of 200 twin pairs

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Background and Aims

We previously reported BMI heritability in the UAE to be 39.9%; indicating a high (60.1%) contribution of environmental factors to obesity. This study aims to determine and compare co-twin monozygotic (MZ) and dizygotic (DZ) BMI concordances.

Materials and Methods

200 twin pairs were identified (ICLDC patient database) and split into two groups (children and adolescents: ≤ 18 years and adults: > 18 years). Opposite gender twin sets were considered DZ. Same gender twin sets zygosity was defined according to height differences between co-twins (≥ 5 cm = DZ). BMI concordance was defined as a difference of < 3 kg/m². Concordance rates were calculated via pairwise concordance formulae then used to calculate the likelihood ratio (χ^2) i.e. the significance of the difference between MZ and DZ concordance rates (critical value of 3.84 was based on 1 degree of freedom at a 0.05 statistical significance level).

Results

For the 96 children and adolescent twin sets: (mean age 10.9 ± 4.1 years, BMI 18.9 ± 6.4 kg/m²), (1) 64 pairs were concordant (MZ: 27 pairs and DZ: 37 pairs), (2) 32 pairs were discordant (MZ: 8 pairs and DZ: 24 pairs), (3) calculated pairwise concordance was MZ: 0.77 and DZ 0.61 and (4) χ^2 for BMI concordance between MZ and DZ was 1.22. For the 104 adult twin sets: (mean age 46.8 ± 16.8 years, BMI 28.4 ± 6.7 kg/m²), (1) 53 pairs were concordant (MZ: 28 pairs and DZ: 25 pairs), (2) 51 pairs were discordant (MZ: 40 pairs and DZ: 11 pairs), (3) calculated pairwise concordance was MZ: 0.41 and DZ: 0.69 and (4) χ^2 for BMI concordance between MZ and DZ was 3.34.

Conclusion

Following null hypothesis χ^2 model analysis, no association between zygosity and BMI concordance was indicated suggesting that environmental factors have a larger impact on BMI than genetics in this population.