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Dehydration May Be a Novel Risk Factor of Insulin Resistance and Poor Body Fat Distribution

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Objectives: We aimed to identify the association of hydration status with insulin resistance (IR) and body fat distribution.

Methods:

A total of 14,721 adults who participated in the Korea National Health and Nutrition Examination Survey 2008-2010. We used urine specific gravity (USG) to indicate hydration status and HOMA-IR (homeostasis model assessment of IR) and regional adiposity as primary outcomes.

Results:

Increased USG was associated with higher odds for high IR, and the association was independent from cardiometabolic confounders and was nonlinear. Increased USG was also associated with increased HOMA-IR score, but the relationship was J-shaped. For this relationship, the threshold value of USG was 1.030 using Akaike's information criterion. Moreover, increased USG was independently associated with increased trunk fat, decreased leg fat, and increased trunk-to-leg-fat ratio. The positive relationship between USG and high IR was not affected by age and sex. However, hyperglycemia and the number of metabolic syndrome components significantly modified the effect of increased USG on the odds for high IR.

Conclusions:

Dehydration was associated with increased IR. This association might be indirectly influenced by the negative effect of dehydration on body fat distribution. Further studies are necessary to confirm our findings.