Obesity may dampen taste sensitivity in children and adolescents

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Young subjects with obesity were found to have a lower ability to identify the correct taste qualities and rated sweetness lower in intensity compared to their peers with normal-weight. These are the results of a cross-sectional study executed by German researchers from the Universitätsmedizin in Berlin and the University of Dresden.

Taste is perceived by the taste buds on the tongue and can be categorised into five basic qualities: sweet, salty, bitter, sour, and umami (a savoury or meaty taste). Early-life exposure to, and acceptance of, the different taste qualities is thought to play an essential role in shaping our eating behaviours.

It has been found previously that the sensitivity for taste differs between individuals with low versus high body mass index (BMI). However, this has predominantly been investigated for bitter taste and data are partly inconsistent and insufficient when it comes to children and adolescents. Taste blindness for bitter has on the one hand been associated with more pleasant ratings for the bitter taste as found in some vegetables. But on the other hand this lower perception of bitter has been associated with a higher BMI. Regarding the latter it has been hypothesised that this lower perception of bitter goes along with lower sensitivities for sweet taste and a fatty texture, and that more of a certain food is needed to reach the same taste sensation. Little is known about the other taste qualities and data in children and adolescents are scarce. The aim was therefore to study the sensitivity to all five taste qualities in young individuals to see whether it relates to bodyweight.

The article reports on two experiments that were performed in a cross-sectional design. In both experiments subjects with obesity (n=99) were compared with their peers with normal-weight (n=94), all in the age range of 6 to 18 years. In the first trial the five different tastes were presented, in the form of taste strips impregnated with taste solutions, in four increasing concentrations. At each level of concentration, the order of taste quality was randomised and the subjects had to identify the correct quality. In the second trial the subjects were asked to rank the different concentrations for sweet that were again randomly presented.

The results for trial 1 showed that both the taste qualities sweet and salty were identified correctly most often and that the participants confounded salty repeatedly with sour and umami. Both girls and older individuals had higher scores, whereas ethnicity (the largest proportion originating from Turkey) had no effect. Subjects with obesity had a significantly lower total score in identifying the correct taste quality compared to their peers with normal-weight with respective scores of 12.6±3.0 versus 14.1±3.0 (out of a maximum of 20 points). Significant lower individual scores were found for salty, bitter and umami.

In trial 2, both study groups rated higher concentrations of sweet higher on the sweetness scale but subjects with obesity rated all concentrations lower on intensity compared to the control group.

The authors explain that the reasons for these differences in taste sensitivity are poorly understood and
most likely multifactorial, including genetic, hormonal and learning factors. Putting their results into context, the authors speculate that the lower sensitivity for savoury (salty and umami) could be important for children’s weight status as children with obesity eat significantly more savoury snacks. The data is however inconsistent and especially regarding young people, scarce. The lower rating of sweetness was found in previous research and these results also show that taste sensitivity differs between subjects with and without obesity. That women are better tasters than men was also found in earlier research. Increasing age was in the current study associated with increased scores for the normal-weight, but not for the subjects with obesity. According to the authors, increased taste sensitivity with increasing age is the normal development, and the absence of this in individuals with obesity is confirming that the taste system is affected.

The authors conclude their results confirm previous findings that children with and without obesity and adolescents differ in their taste perception. However, long-term studies are needed to better understand how these differences are brought about. Nonetheless, taste perception appears more susceptible than originally thought and further insight could potentially help develop strategies for obesity prevention.

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