Abstract

The aim of our study was to examine olfactory functions (odor detection thresholds, odor identification and odor preference) and to explore their relationship with psychopathology in children with autism spectrum disorders (ASD). Thirty-five patients with Asperger's syndrome and high functioning autism (mean age 10,8 ± 3,6 years; 31 boys) were compared with 35 healthy control subjects (mean age 10,4 ± 2,4 years; 28 boys). There were no significant differences between groups with regard to mean age (p = 0,598) and gender proportion (p = 0,324). Olfactory testing (threshold and identification) used the Sniffin' Sticks test. Odor pleasantness was assessed on a 5-point scale using the Identification part of the Sniffin' Sticks test. The severity of autistic psychopathology was measured by the Childhood Autism Rating Scale (CARS).

Participants with ASD, in comparison with healthy controls, were significantly impaired relative to odor detection thresholds (6,3 ± 3,1 vs. 7,9 ± 2,0; p = 0,025). Autistic participants were significantly better in correctly identifying the odor of an orange (94 vs. 63%; p < 0,05) and significantly worse at correctly identifying the odor of cloves (40 vs. 74%; p < 0,05). With regard to identification of fourteen other substances, there were no significant differences. There was no significant diference between autistic and control subjects on the total score of olfactory identification (10,7 ± 2,55 vs. 10,6 ± 2,76; p = 0,799). Odor identification ability (as expressed by this total score) correlated significantly with age in the control group (p = 0,049), but not in the autism group (p = 0,103). Patients with ASD, compared to healthy controls, perceived the smell of cinnamon and pineapple as significantly less pleasant (p < 0.05); at the trend level, the same was true of cloves (p < 0,1). In absolute values, orange was perceived as the most pleasant odor among autistic participants (mean score 1,66) and banana (mean score 1,63) for controls. Clove was perceived as the most unpleasant smell for the autistic group (mean score 3,89) and turpentine for the control group (mean score 4,03).

We found no significant correlations of the severity of autistic psychopatology (as expressed by the total CARS score) with odor detection thresholds (r = 0,127; p = 0,469), odor identification (r = 0,04; p= 0,981) or odor pleasantness (r = -0,173; p = 0,319). There was also no significant relationship of the CARS item No.9 („Taste, smell, and touch response and use") with odor detection theresholds (r = 0,103; p = 0,555), odor identification (r = 0,247; p = 0,152) or odor pleasantness (r = -0,058; p = 0,741).

We found impaired odor detection and almost normal odor identification in children with ASD. Autistic subjects assessed all the odors, overall, as less pleasant than control subjects, however, the difference was not significant (p = 0,123). Finally, we did not find any significant relationship between the severity of autistic symptomatology and olfactory functions.