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Title: Neurocognitive impairment in children with obesity and sleep disordered breathing

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Body: Aims: To compare neurobehavioral disorders in children with Sleep-Disordered Breathing (SDB), with SDB and obesity and in normal controls. Methods: We studied 36 children with SDB (Group 1: M/F 21/15; mean age 8.29 ± 2.04 years, body mass index, BMI, percentile $62,61 \pm 29,65$), 38 children with SDB and obesity (Group 2: M/F 27/11; mean age 8.73 ± 1.69 years, BMI percentile $116,52 \pm 15,95$) and 58 non obese control (Group 3: M/F 29/29; mean age 8.89 ± 1.62 years). Groups 1 and 2 underwent clinical evaluation, overnight polysomnography, Attention Deficit/Hyperactivity (ADHD) rating scale and neurocognitive assessment based on Wechsler Intelligence Scale for Children (WISC-R). Group 3 underwent clinical interview and neurocognitive assessment. Results. Verbal Intelligence Quotient (VIQ), Performance Intelligence Quotient (PIQ) and Full-Scale Intelligence Quotient (FSIQ) were lower in groups 1 e 2 than in controls (VIQ $98,11 \pm 12,68$ vs $91,78 \pm 16,11$ vs $109,63 \pm 12,04$; PIQ: 100.63 ± 14.98 vs 93.92 ± 14.89 vs 117.27 ± 11.96 ; FSIQ: 96.75 ± 13.51 vs 91.81 ± 13.97 vs 114.93 ± 11.05 , respectively) ($p < 0.05$). A positive correlation between PIQ and age of onset of SDB ($r = 0,335$, $p = 0,04$) was found in group 1. A positive correlation between VIQ and age of onset of SDB ($r = 0,335$, $p = 0,05$) and a negative correlation between VIQ and duration of SDB ($r = -0,362$, $p = 0,02$) PIQ and BMI percentile ($r = -0,341$, $p = 0,03$), FSIQ and Apnea/Hypopnea index ($r = -0,321$, $p = 0,05$) were found in group 2. ADHD scores correlated negatively with IQ scores in all subjects. Group 1 had the highest hyperactivity score. Conclusions. Children with obesity and SDB showed the highest cognitive impairment while children with only SDB the highest hyperactivity score.