

CHILDREN WITH CHROMOSOME 22Q11.2 DELETION SYNDROME (22q11.2DS) HAVE SMALLER PUTAMEN THAN TYPICALLY DEVELOPING (TD) CHILDREN

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OBJECTIVE: The putamen is part of the striatum in the brain and is involved in observational learning and motor processes (Cincotta & Seger 2008), but its role in cognitive processes is under investigation especially in relation to mental illness such as schizophrenia. Smaller putamen volume is also associated with poorer prognosis in patients with schizophrenia (Buchsbaum et al., 2008). Given the ultra-high risk of schizophrenia in people with 22q11.2DS (Basset et al., 2008) we examined putamen volumes in children with this complex neurodevelopmental disorder.

METHODS: We measured putamen morphometry in 15 boys and girls (aged 8-16) with 22q11.2DS in comparison to 15 typically developing age-matched peers. T1-weighted images collected by MRI were manually traced and analyzed in Mango (v4.0.1) for bilateral putamen volume by 1 mm³ voxel count.

RESULTS: Combining left and right putamen volumes, children with 22q11.2DS did not differ from TD [$t(28) = 1.76, p > 0.05$]. However, contrasting one brain hemisphere at a time indicated smaller right [22q11.2DS: $M = 4896.40 \text{ mm}^3$ vs. TD: $M = 5088.40 \text{ mm}^3$; $t(28) = 3.08, p < 0.001$, Bonferroni corrected] and left [22q11.2DS: $M = 3930.80 \text{ mm}^3$ vs. TD: $M = 4896.07 \text{ mm}^3$; $t(28) = 3.07, p < 0.001$, Bonferroni corrected] putamen in children with 22q11.2DS as a group. Furthermore, within the 22q11.2DS group, the left and right putamen showed no volumetric difference ($M = 3930.80$ vs. $M = 4025.07$), [$t(14) = 1.68, p > 0.05$].

CONCLUSIONS: Children with 22q11.2DS have smaller left and right putamen on average compared to age-matched TD children. While this may indicate general brain atrophy in this population, it may also provide insight into risk of schizophrenia in this population. Further study relating putamen volume and prodromal indicators of schizophrenia is warranted in children with 22q11.2DS.

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