



Somatosensory temporal discrimination in adolescents with Tourette Syndrome: a pilot study

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Introduction

Temporal discrimination is the ability to determine that two sequential sensory stimuli are separated in time. For any individual, the somatosensory temporal discrimination threshold (STDT) is the minimum interval at which paired sequential stimuli are perceived as being asynchronous; this can be assessed, with high test-retest and inter-rater reliability, using a simple psychophysical test¹. Temporal discrimination is disordered in a number of basal ganglia diseases reported in adulthood. In Tourette syndrome (TS) an altered dopamine release in the mesocortical and/or meso-striatal and an altered connectivity between prefrontal cortex and sub-cortical structures was reported as well². Thus, based on these assumptions, our aim was to investigate whether the somatosensory temporal discrimination threshold (STDT), or automatic time processing, is additionally altered in TS pediatric patients.

Materials and methods

We enrolled 11 TS subjects and 11 age-matched healthy controls (age range 12-18 years old, mean 14 years old; M: F=4:1). TS participants were selected with tic severity scoring from moderate to severe at the Yale Global Tic Severity Scale at the time of enrollment and any cognitive impairment at the Wechsler scales. Five patients were TS-only while 6 presented a TS-plus phenotype with further comorbidities (1 ASD; 2 ADHD; 3 OCD). The STDT was tested three times on the index finger of both hands, with a stimulus duration of 0.2 msec, and an intensity of 1 mA above the somatosensory threshold.

Results

The TS group did not significantly differ from the control group (CG) in the STDT scoring (TS mean 93 msec; range 33,3-120 msec vs CG mean 76 msec; range 53,3- 93 msec) but towards the TS group a different trend of performance was observed among the TS-only (mean 70 msec; range 33,3 - 83,3 msec) and TS-plus subjects (mean 100 msec; range 86,7 -120 msec) (Chart 1).

Conclusions

Although these preliminary findings seem to contradict the hypothesis of an altered somatosensory temporal discrimination threshold in Tourette pediatric patients, of relevance seems to be the different trend among TS-plus and TS-only subjects in STDT performance. Indeed, in TS-plus the STDT was more compromised, as reported also in the comorbid conditions only (i.e., ADHD/OCD), linked with the dysfunctional connectivity between basal ganglia and prefrontal cortex and altered dopaminergic transmissions. Instead, the improvement of time processing in children with TS-only was previously reported in literature and hypothesized consistent with an enhancement in the 'cognitively controlled' timing system, probably facilitated by the constant mechanism of the effortful tic suppression.¹

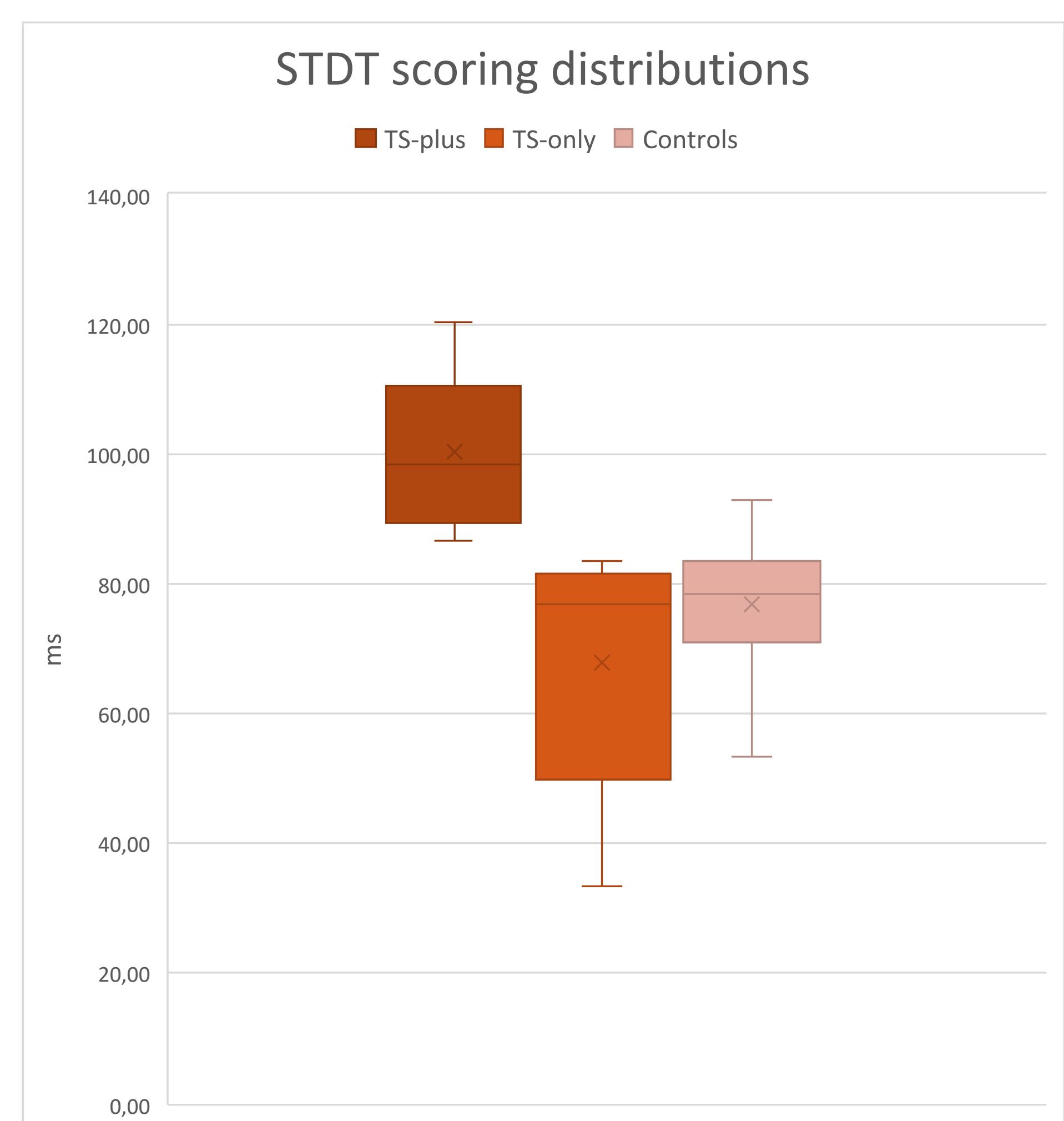


Chart 1. STDT scoring distribution among TS-plus subjects, TS-only subjects and controls.

References

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