Cognitive Deficits Described in People With Tourette Syndrome

Dr Rabia Khan ST5 in Psychiatry of Intellectual Disability

ABSTRACT

Introduction: TS is a neurodevelopmental disorder starting before the age of 18 years characterised by the presence of at least one vocal and multiple motor tics lasting for a year and not explained by medications or another medical condition. TS is thought to occur due to striatal dysfunction in the brain subsequently affecting the frontostriatal pathways (6) possibly leading to disinhibition and executive function deficits (1).

Method: Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist was followed to analyse 4 studies from 2014 – 2019. Results: While some studies show no difference in cognitive functioning in patients with TS others show some associated decline. The discrepancies seem to be associated with methodological differences such as sample size and varied neuropsychological assessment tools used to explore various cognitive sub processes.

Conclusion: Cognitive deficits in TS is still a less understood topic that will need further research using larger samples and valid neuropsychological assessment tools. Neuroimaging studies to compound the neuropsychological testing can yield more conclusive results.

BACKGROUND

The neurological basis of TS is not clearly understood. It is generally agreed that a wider dysfunction in basal ganglia, frontostriatal circuitry and cortical-striatal-thalamic-cortical (CSTC) circuitry can lead to this disorder (2,5). Thereby prompting the exploration of cognitive deficits in TS (2).

Executive regulation and control are extensively related to cognitive processes, which are part of the Executive Function system. Executive function is a complex cognitive processing mechanism that requires coordination of several sub processes to achieve a certain goal (5).

Executive function includes abilities of goal formation, planning, set shifting, response inhibition, carrying out goal directed plans, and effective performance (5).

A wide majority (88%) of children with TS have comorbidities that can contribute in adversely affecting cognitive and behavioural outcomes of TS. ADHD is the most commonly associated comorbid disorder - 60% (4) and OCD 28% - 63% (2).

AIM

The aim of the study is to evaluate recent evidence regarding cognitive deficits in people with Tourette Syndrome.

METHOD

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist. Two databases PsychINFO and EMBASE from 2014 – present (last 5 years) were used for a comprehensive search strategy using Cheshire and Wirral NHS Foundation Trust Healthcare and Management Databases. The key words were ‘Tourette’s’ OR ‘(TS)’ OR ‘(TS)’ and ‘(cognitive)’ AND ‘(deficit)’ OR ‘(disorder)’ OR ‘(function)’. Records were limited to those in English language.

RESULTS

Studies showed disparity in results due to differences in sample sizes, ages of the participants, co-morbidities and varied psychological assessment tools that explored different cognitive sub processes.

The studies considered the prevalence of other co-morbid conditions like ADHD, OCD and impulse control disorders and tried to minimise their confounding effects via their adopted methodology and statistical analysis. Nonetheless, the symptoms were highly inter-correlated and their cumulative effect on the results could not be entirely refuted (1).

The severity of tics in individuals was associated with impairment of response inhibition and attentional set shifting in particular. However, it remained unclear if this was a ramification of TS implicated by functional impairment or associated symptoms videlict tic suppression or release (2).

Broader cognitive functioning was intact in TS. Deficits were noted in specific cognitive domains linked with attention, processing speed and working memory (2).

DISCUSSION

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CONCLUSION

• The relationship between TS and cognitive deficits is complex and an area still to be cognized with.

• While some studies show no difference in cognitive functioning in patients with TS others show some associated decline and in one study evaluated for this article even an enhancement of the procedural learning was discussed (3).

• An interesting aspect was the notion where TS with and without comorbid ADHD were represented as two distinct types, because possible deficits in executive functioning were primarily explained by comorbid ADHD and not inherently associated with TS (1).

• Neuroimaging studies to compound the neuropsychological testing can yield more conclusive results.

REFERENCES:

1) Oppenweer et al. 2019 Netherland
2) Edby and Cavanna 2017 DOI: 10.1177/1944998217724538
3) Takacs et al. 2017 DOI.org/10.1016/j.ridd.2016.12.007
4) Yaniv et al. 2016 Israel
5) Yaniv et al. 2018 Israel
6) Yaniv et al. 2017 Israel

For additional information please contact: rabia.khan10@nhs.net

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