Introduction

Tourette Syndrome (TS) is characterized by multiple motor and vocal tics and high comorbidity rates with other neuropsychiatric disorders. Obsessive Compulsive Disorder (OCD), Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), Major Depressive Disorder (MDD) and Anxiety Disorders (AXD) are among the most prevalent TS comorbidities. To date, studies on TS brain structure and function have been limited in size with efforts often fragmented. On the other hand, genetic studies are starting to uncover robust genetic loci for TS. Leveraging an international network of collaborators, ENIGMA-TS will offer the largest cross-disorder GWAS meta-analysis for TS-OCD, ASD, ADHD and AXD. We take advantage of access to data, resources and standardized pipelines from the ENIGMA (Enhancing Neuroimaging Genetics Through Meta-analysis) consortium. Our first goal for joint analysis includes a study of cortical and subcortical neuroanatomical signatures for more than 1,000 patients with TS and equal number of controls.

Results and conclusions

With 90% of TS patients presenting with additional neuropsychiatric comorbidities, understanding the molecular, pathological and neuroanatomical underpinnings of TS should also extend to investigating relationships to other comorbid disorders. We have performed the largest GWAS for TS (Tsetsos et al. 2021), as well as the largest cross-disorder GWAS meta-analysis for TS, ADHD, ASD, and OCD (Yang et al. 2021). Our work already highlights the power of collaborative efforts and transdisciplinary approaches and points to the existence of different TS subtypes. ENIGMA-TS will offer large-scale, high-powered studies that will lead to important insights towards understanding brain structure and function and genetic effects in TS as well as biomarkers that could help inform improved clinical practice.

Methods

ENIGMA-TS brings together investigators from around the world with a goal to perform large-scale studies of brain structure and function in TS. Previously collected TS neuroimaging data (structural, diffusion tensor imaging, and resting-state functional MRI) will be analyzed jointly and integrated with genomic data as well as equivalently large and already existing studies of highly comorbid OCD, ADHD, ASD, as well MDD, and AXD. We take advantage of access to data, resources and standardized pipelines from the ENIGMA (Enhancing Neuroimaging Genetics Through Meta-analysis) consortium. Our first goal for joint analysis includes a study of cortical and subcortical neuroanatomical signatures for more than 1,000 patients with TS and equal number of controls.

With 90% of TS patients presenting with additional neuropsychiatric comorbidities, understanding the molecular, pathological and neuroanatomical underpinnings of TS should also extend to investigating relationships to other comorbid disorders. We have performed the largest GWAS for TS (Tsetsos et al. 2021), as well as the largest cross-disorder GWAS meta-analysis for TS, ADHD, ASD, and OCD (Yang et al. 2021). Our work already highlights the power of collaborative efforts and transdisciplinary approaches and points to the existence of different TS subtypes. ENIGMA-TS will offer large-scale, high-powered studies that will lead to important insights towards understanding brain structure and function and genetic effects in TS as well as biomarkers that could help inform improved clinical practice.

Results and conclusions

With 90% of TS patients presenting with additional neuropsychiatric comorbidities, understanding the molecular, pathological and neuroanatomical underpinnings of TS should also extend to investigating relationships to other comorbid disorders. We have performed the largest GWAS for TS (Tsetsos et al. 2021), as well as the largest cross-disorder GWAS meta-analysis for TS, ADHD, ASD, and OCD (Yang et al. 2021). Our work already highlights the power of collaborative efforts and transdisciplinary approaches and points to the existence of different TS subtypes. ENIGMA-TS will offer large-scale, high-powered studies that will lead to important insights towards understanding brain structure and function and genetic effects in TS as well as biomarkers that could help inform improved clinical practice.

With 90% of TS patients presenting with additional neuropsychiatric comorbidities, understanding the molecular, pathological and neuroanatomical underpinnings of TS should also extend to investigating relationships to other comorbid disorders. We have performed the largest GWAS for TS (Tsetsos et al. 2021), as well as the largest cross-disorder GWAS meta-analysis for TS, ADHD, ASD, and OCD (Yang et al. 2021). Our work already highlights the power of collaborative efforts and transdisciplinary approaches and points to the existence of different TS subtypes. ENIGMA-TS will offer large-scale, high-powered studies that will lead to important insights towards understanding brain structure and function and genetic effects in TS as well as biomarkers that could help inform improved clinical practice.