INPLASY PROTOCOL

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The authors declare no conflict of interests.

Role of psychotherapy strategy for the management of patients with Tourette syndrome — A systematic review and Bayesian network meta-analysis

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Review question / Objective: Population: Participants were any age with TS diagnosed by proper medical diagnosis criteria, such as the Diagnostic and Statistical Manual, fourth edition or the text revision of fourth edition. The Chinese Classification of Mental Disorders (CCMD) whether measure with second revision version (CCMD-2R) or third version (CCMD-3). Interventions: Acceptable treatments included any structured and conceptualized psychological treatments such as ERP, HRT, CBIT. Any psychotherapy in combinatorial or multicomponent were excluded. Comparators: Studies were included if their comparison group were set as any placebo such as active psychotherapies, or a control condition, such as wait-list, treatment-as-usual, or Named control group (NCG) while the studies were excluded when their control group was conducted in any combination with any placebo. Outcome: As an indication for reporting the improve rate both happened in treatment and control group, the primary outcome was Yale Global Tic Severity Scale (YGTSS) which measured the mean overall change in tic symptom from baseline to endpoint. Study design: Only the parallel-group RCTs including cross-over, parallel-group and cluster trials which published without language restriction were selected.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 September 2020 and was last updated on 27 September 2020 (registration number INPLASY202090095).

INTRODUCTION

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Condition being studied: Based on several bibliographical databases, we performed an elaborate and systematic search to identify the qualified Randomized controlled trials(RCTs) in which any psychology therapies for the treatment of TS were compared with each other or alone, from the inception of each database up to 1st August 2020 without language restriction. The main outcome was in accordance with Yale global tic severity scale(YGTSS) for evaluating the efficacy of psychotherapies. Data were polled as Standard mean difference(SMD) under the framework of Bayesian random effect model.

METHODS

Participant or population: Participants were any age with TS diagnosed by proper medical diagnosis criteria, such as the Diagnostic and Statistical Manual, fourth edition or the text revision of fourth edition. The Chinese Classification of Mental Disorders (CCMD) whether measure with second revision version (CCMD-2R) or third version (CCMD-3).

Intervention: Acceptable treatments included any structured and conceptualized psychological treatments such as ERP, HRT, CBIT. Any psychotherapy in combinatorial or multicomponent were excluded.

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Study designs to be included: Only the parallel-group RCTs including cross-over, parallel-group and cluster trials which published without language restriction were selected.

Eligibility criteria: The relevant randomized controlled trials (RCTs) which investigating the efficacy association between psychotherapies and Tourette Syndrome.

Information sources: Without language and publication year restrictions, a comprehensive literature search was carried out for identifying the relevant randomized controlled trials (RCTs) which investigating the efficacy association between psychotherapies and Tourette Syndrome (TS) in the following electronic databases: Medline (via Pubmed), Embase, Cochrane, Web of science, CINAHL, PsycINFO (via ovid), Chinese National Knowledge Infrastructure, Wanfang Data, Chinese Scientific Journal database, the Chinese Biomedical Literature Database, Chinese clinical trial registry, Clinical trials(www.clinicaltrials.gov) from their inception to August 1st, 2020. Through the way that the Medical subject headings (MeSH) incorporated with free text terms by using the Boolean logical operators, an exhaustive search was implemented by considering the following terms: "Tourette Syndrome", "psychotherapy", "Comprehensive Behavioral Intervention" , "Exposure with response prevention", "Habit reversal training", "Behavioral

therapy", "Randomized controlled trial". Moreover, we conducted a serious of recursive searches as complementary retrieval from top journal, famous publisher or major international conference proceedings to minimize the loss of omission of suitable articles for meting our inclusion criterion. The bibliographies of relevant meta-analyses and reviews were additionally manual searched in consideration of omitting the potentially eligible articles.

Main outcome(s): As an indication for reporting the improve rate both happened in treatment and control group, the primary outcome was Yale Global Tic Severity Scale (YGTSS) which measured the mean overall change in tic symptom from baseline to endpoint.

Quality assessment / Risk of bias analysis: by two investigators independently, which included seven items (random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias) and each of the item was rated as unknown, low and high risk of bias, respectively. Any disagreement was addressed through joint discuss of the section to reach consensus.

Strategy of data synthesis: Because the existence of effect sizes relate to consecutive outcome, group (relevant) means and standard deviations (SDs) of personal studies were used to compute each comparison's standard mean differences (SMDs). The calculation of the flowing 95% Credibility Interval (CrI) and pooled SMDs were served respectively to measure estimated insurely and pooled effect sizes. Network transitivity being the most crucial supposition in NMA, its evaluation would have direct influence for us to analyze further. Three Markov chains in parallel were built firstly at random to imitate precise estimation of statistical patterns. Every chain produced 50000 iterations, and according to the burn-in cycle, the original 10000 iterations were abandoned for minimize the deviations of

initial effect as the chain achieved its distribution goal. The Brooks-Gelman-Rubin diagnostic was used to estimate the convergence of patterns by uniting trace plot and density plot to make visual observations of the historical trajectory. The surface under the cumulative ranking curve (SUCRA), an evaluated probability served as sorting the aimed psychosocial intervention, was used as an ordinary numerical statistic cumulative ranking probability diagrams to sum up each treatment. SUCRA of a higher values makes it more likely that the presented treatment is in the topmost level or quite valid, while 0 manifests the treatment is certainly the worst. In order to find out whether an inconsistent latent source will appear in our network, we took "node=splitting" technique, in which we made comparisons between the direct and indirect evidence from the whole network(that P-value higher than 0.05 means consistency generates).

Subgroup analysis: Not applicable.

Sensibility analysis: Not applicable.

Country(ies) involved: China.

Keywords: Psychotherapy strategy, Tourette syndrome, Bayesian network meta-analysis.

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