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Randomized control trial of using tongue acupuncture in autism spectrum disorder

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child

Abstract *Objective:* The therapeutic approach of traditional Chinese Medicine (TCM) in autism spectrum disorder (ASD) is a functional one. To study the efficacy, safety and functional brain change from the use of tongue acupuncture (TAC) on ASD children.

Methods: 21 autistic boys (3–16 years old) were randomly assigned to TAC group (TAC: $n = 12$; receiving daily TAC for 8 weeks) or control (C: $n = 9$; no acupuncture). Primary outcome measures included Autism Treatment Evaluation Checklist (ATEC), Reynell Language Developmental Scale, Symbolic Play Test (SPT), Functional Independence Measure for Children (WeeFIM), Clinical Global Impression (CGI) Scale and Cerebral FDG Metabolism by PET.

Results: There were significant improvement in speech domain of ATEC ($p = 0.030$), Self-care domain of WeeFIM ($p = 0.021$), cognition domain of WeeFIM ($p = 0.001$) and Total score domain of WeeFIM ($p = 0.001$) in TAC group compared to the C group. There were significant difference in positive clinical response between C and TAC group in language ($p = 0.0211$), functional ($p = 0.0011$), parental Impression criteria ($p = 0.0003$) and overall cerebral glucose metabolism ($p = 0.0451$) using ROC criteria. No significant association of PET Glucose Metabolism with Clinical response was found. None of the children developed any side-effects.

This randomized controlled trial was subsequently registered with the Clinical Trials.gov as the study had been completed in 2001 (July 20, 2006; identifier: NCT00355329).

Autism Spectrum Disorder (ASD) and Autism will be used interchangeably in this paper.

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Conclusion: A short course of TAC can improve specific functions in children with autism spectrum disorder, especially speech and cognition function. No statistical significant association of PET Glucose Metabolism with Clinical response. Larger scale with more sample size trial should be done for further investigation.

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder affecting language, communication, social interaction, and behavior.¹ Autism is a heterogeneous disorder, commonly used therapies are a combination of specialized and supportive educational programming, communication training, psychosocial and behavioral and developmental interventions,^{2–8} however no consensus can yet be made for the best treatment as there is great variability in the strength of evidence, ranging from an absence of evidence to anecdotal and no validation to varying extent.

In traditional Chinese acupuncture, nearly 400 acupoints on the body surface are interrelated to various functions. Acupuncture has been practiced in China for over 2 millennia. Specific acupoints in the tongue corresponding to various organs, and meridians were used for autism. The organ and meridian concept in the TCM model has been assumed as a fundamental basis to improve the behavior, cognition, and communicative ability in children with autism.

We have demonstrated clinical efficacy of acupuncturing the surface or base of the tongue in specific acupoints in improving various functional modalities in patients with chronic neurological disorders such as ASD, cerebral palsy, stroke, and drooling problems.^{9–15} In our experience, the TCM approach for autism is more holistic. Autism is postulated as part of the spectrum of lower intelligence. Thus, the approach to autism is considered as lower intelligence due to “Heart-meridian and Kidney-meridian *yin-yang* imbalance” resulting in a communication problem and “Liver-meridian *yin-yang* imbalance” leading to behavioral problems.

Objective

We attempted to use a different approach in looking at autism and to assess the efficacy of an innovative method in TCM for improving the functional status of these children. The objective was to study the efficacy of a short course of tongue acupuncture (TAC) in improving the overall functional status of autism. This randomized controlled trial has been subsequently registered with the ClinicalTrials.gov (July 20, 2006; identifier: NCT00355329) after completion of the study in 2001.

Ethical approval

This study was approved by the Ethics Committee of the Faculty of Medicine of the University of Hong Kong-Hong

Kong West Cluster. The parents were informed about the methodology, and written consent was obtained.

Methods

Subjects

A total of 27 autistic boys were consecutively recruited from the Autism Research Clinic (Duchess of Kent Children Assessment Centre of Duchess of Kent Children Hospital) during 1998–2001. The inclusion criteria included a previous diagnosis of autism using standard criteria of the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) by our first author (V.W.). Children with associated neurological disorders such as tuberous sclerosis, fragile X syndrome, and epilepsy were excluded. The age ranged between 3 and 16 years old.

All children were diagnosed as autism and had a comprehensive neurological and developmental evaluation by the first author (V.W.). All children were observed in an assessment setting, and a semi-structured diagnostic interview with the parents was made. Children were recruited only if they satisfied both criteria using the Autism Diagnostic Interview-Revised and with a score greater than 30 in the Childhood Autism Rating Scale (CARS).

Randomization and concealment allocation

27 Participants were randomized into two groups: Control group versus Tongue Acupuncture Treatment (TAC) group. Randomization was achieved by computer generation of C or TAC groups performed by independent statistician. They were randomly assigned to receive TAC. The conventional educational and behavioral model for autistic children was continued for both groups. Clinical assessor (V.W.) and Positron Emission Tomography (PET) scan assessor (D.W.C.Y.) were blinded to the randomization and allocation of groupings. Only the acupuncturist (J.G.S.) who performed TAC was not blinded.

Intervention

27 children attended our Tongue Acupuncture Research Clinic on an ambulatory basis. A total of 40 sessions (daily sessions) for a total course of 8 weeks were administered to TAC group. They were discharged immediately after the acupuncture session. All 27 children continued their conventional autism program.

In the TAC group, the patients received a total course of 40 sessions, with 5 daily sessions per week over 8 weeks,

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