



Original Article

## Zhoubo plus uncaria tincture in the treatment of cerebral concussion sequelae

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**Abstract.** [Purpose] This study investigated the clinical efficacy of the compound gouteng tincture combined with Zhoubo (GT-ZB) in treating the sequelae of cerebral concussion (CC) in children. [Subjects and Methods] Sixty children with CC-sequelae were randomly divided into a treatment group and a control group, with 30 cases in each group. The treatment group was treated using GT-ZB, and the control group was treated using the standard method of venoruton, dibazol, and Vitamin B6. The efficacies of the two treatments were compared. [Results] Compared with the control group, the clinical symptoms and signs in the treatment group were significantly mitigated. [Conclusion] GT-ZB demonstrated efficacy in treating the sequelae of CC in children, and it is worthy of further studies and possible clinical recommendations.

**Key words:** Sequela of cerebral concussion in children, Zhoubo, Acupuncture point

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### INTRODUCTION

Brain concussions in children are common and although there is sometimes a brief loss of consciousness or memory loss, in general there are no serious neurological sequelae, and maintenance of normal brain stem function. The sequelae of cerebral concussion (the transient brain dysfunction caused by external forces, is the lightest of kind brain damage) are short; usually, 1 to 12 months. Many Chinese medicine treatment methods include all kinds of decoction and acupuncture, and for many children, these are not easily accepted<sup>1-5)</sup>, while Western medicine treatment cycles are long and may include intravenous drips and considerable pain<sup>6-10)</sup>. Most children are afraid of pain and will not easily drink medicine. However, tissue repair and regeneration abilities in children are high, leading to the elimination of symptoms and relief of mental confusion as well as the worry of their parents. Taking one cycle of the compound gouteng tincture combined with Zhoubo [collaborative application of traditional Chinese medicine (uncaria and other herbal tincture) and a warm and low frequency therapeutic instrument] for comprehensive treatment can not only improve clinical efficacy but also shorten the course of the disease, achieving painless treatment symptom relief, and a more powerful therapeutic effect due to the effects of traditional Chinese medicine. The cure rate with this medicine was 96.7% with an average duration of 15 days compared with the control group ( $\chi^2=10.55$ ,  $p<0.01$ ). There were significant differences between the two groups, with the treatment group showing a strong curative effect over a shorter clinical course. The purpose of this study was to find a better clinical treatment method, but the evidence of this study offers a good method for the treatment of infantile cerebral concussion sequelae and is worthy of further clinical research and recommendation.

### SUBJECTS AND METHODS

All 60 subjects were admitted to and treated in the Department of Pediatrics at our Hospital within the past five years.

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They included 42 boys and 18 girls. Thirty-one patients were aged between 2–4 years, 10 were between 4–7 years, and 19 cases were between 7–13 years. The oldest was 13 years of age, and the youngest was 2. The shortest disease duration was two weeks while the longest was 12 weeks. This study was conducted in accordance with the principles of the Declaration of Helsinki. This study was conducted with approval from the Ethics Committee of Xuzhou Cancer Hospital. Written informed consent was obtained from all the participants' guardians.

Skull routine scanning showed no fracture, and lumbar puncture manometry showed normal brain pressure and no red blood cells in the cerebrospinal fluid. Electroencephalograph (EEG) only exhibited low–high-amplitude fast waves accompanied by an occasional diffuse  $\delta$  wave and  $\theta$  wave, which recovered within 1 to 2 days. Some patients had scattered slow waves which returned to normal within 1 to 2 weeks. The brainstem auditory tests exhibited the prolongation of the I–IV wave intervals or of V wave latency, amplitude reduction, or wave disappearance, but negative results were obtained in both computed tomography (CT) plain and enhanced scanning.

After head trauma, patients exhibited clinical symptoms such as headache, dizziness, vomiting, hyper-convulsion, irritability, inattention, various degrees of amnesia, apathy, unexpected emotional responses, sluggish appearance, or anxiety. Auxiliary examinations such as imaging showed normal results.

The treatment group received electro-acupuncture with Zhoubo electrodes stimulating the related acupuncture points plus compound gouteng tincture (GT). Two negative Zhoubo electrodes were placed on the temples and the positive electrode was placed on the neck, and then normally operated with the blood circulation function for 15 min, once per day for 10 days as a treatment course. Then, the compound GT tincture was infiltrated using one drug (250 g of *Uncaria rhynchophylla*, *Salvia miltiorrhiza*, *Ligusticum sinense*, and *Polygala tenuifolia*, respectively, soaked in 75% alcoholic solution for three months) with the negative electrode placed on the forehead and the positive electrode (compound GT tincture) placed on the neck for 30 min of normal operation, once per day for 10 days as a treatment course. Patients in the control group received conventional treatment with Western medicines, namely venoruton, dibazol, and vitamin B6.

## RESULTS

Therapeutic effects were assessed as follows. Cure: the clinical symptoms and signs disappeared, intelligence (perception, memory, thinking, and imagination) returned to normal, and EEG returned to normal. Ineffective: clinical symptoms and signs did not change; EEG exhibited low–high-amplitude fast waves accompanied with occasional diffuse  $\delta$  wave and  $\theta$  waves. Among the 30 cases in the treatment group, 29 cases were considered cured according to these definitions, and one case was considered ineffective. The cure rate was 96.7%, and the average treatment duration was 15 days. Among the 30 cases in the control group, 19 cases were considered cured while 11 cases were considered ineffective. The cure rate was 63.3%, and the average treatment duration was 35 days. The comparison of the treatment efficacy between the two groups showed significant differences according to the  $\chi^2$  test ( $\chi^2=10.55$ ,  $p<0.01$ ); and the comparison of the treatment duration between the two groups showed significant differences according to the t-test ( $t=18.56$ ,  $p<0.01$ ), indicating that the treatment group exhibited better efficacy and shorter treatment duration times.

A boy, 10 years old and a primary school student, was first treated on March 10, 2004. His symptoms were described by his parents: the boy was knocked to the ground two months earlier when a door collapsed, injuring his waist, leaving him in a state of unconsciousness with one  $3 \times 3$  cm hematoma on the left side of his head. The patient was hospitalized and treated in the County People's Hospital. Skull plain scanning showed no fracture, normal brain pressure was detected by lumbar puncture manometry, and no red blood cells were present in the cerebrospinal fluid. EEG only exhibited low–high-amplitude fast waves accompanied by occasional diffuse  $\delta$  and  $\theta$  waves. Plain and enhanced CT scans were negative. The patient was diagnosed with cerebral concussion (CC) sequelae. After treatment for one week, the patient was discharged. However, following discharge, the patient was often irritable and easily became angry, had problems sleeping at night and experienced occasional headaches during the day, which went away after a few seconds. The patient also exhibited dizziness, swelling, and poor memory. The treatment efficacy of conventional Western medicine was not obvious, and the symptoms occurred frequently over the next-half month, seriously affecting his life and studies. The patient was then referred to our department for treatment, and clinical observation revealed the following symptoms: distressed expression, sluggish appearance, slightly red tongue with a small amount of petechiae, sharp edge, and an irregular but powerful pulse. These symptoms belong to stagnations of the Qi, blood, and collaterals. The patient was treated with gouteng tincture combined with Zhoubo (GT-ZB), and he was subsequently able to express that he had a headache twice but did not feel dizzy or fullness in the head after the headache his memory had also recovered. After one course of treatment, the patient achieved a complete cure and did not suffer a recurrence for 5 years.

A girl, 5 years old, was first treated on April 7, 2006. Her symptoms were detailed by her father: She had fallen off a 1-m-high tank accidentally a month earlier, had one  $4 \times 3$  cm hematoma on her forehead, and cried continuously. After receiving emergency treatment, the hematoma disappeared seven days later; but the patient irregularly held her head and cried with symptoms such as irritability (mainly at night), hyperhidrosis on the head, and an irregular eating habit. All examinations performed showed no organic damage. The patient was diagnosed with CC sequelae. Treatment by conventional Western medicine proved ineffective, so the patient was referred to our department for further treatment. Clinical observation revealed the following symptoms: mental malaise, occasional crying, irritability (mostly at night), and difficulty concentrating, her fin-

gertips appeared dark red and purple, and pushing the fingers felt stagnant and rough; her tongue was red and had petechiae. This patient was administered GT-ZB treatment, and after treatment, she reported that she still had a headache, but her crying was reduced. Her hyperhidrosis stopped, and her sleeping returned normal; however, her spirit remained poor. The patient's pulse exhibited symptoms of damaged spirit. The patient then underwent another 5-day treatment with GT-ZB. She achieved a complete cure, and has had no recurrence for at least five years.

## DISCUSSION

The main purpose of this retrospective study was to find an effective method to treat CC, and the results, which demonstrate relief of patients' pain and shortening of an extensive treatment course, were consistent with this purpose<sup>11–13</sup>.

The pathogenesis of CC sequelae is recognized in Western medicine as connective tissue and nerve tissue damage leading to vascular spasm and occlusion as well as neurological disorders; therefore, comprehensive treatment including antispasmodic drugs, vasodilators, and nerve function regulators is normally used to let body tissues self-repair. However, in traditional Chinese medicine, *Uncaria rhynchophylla* is sweet and slightly cold, and its components enter the liver meridian and pericardium meridian; therefore, it has bioactive effects such as clearing heat, pacifying the liver, and general antispasmodic effects. In recent years, *Uncaria rhynchophylla* has become more and more extensively clinically used for its effects of pacifying the liver in the treatment of hypertension. It does not produce sleepiness as a side effect. Seven days after the administration of *Uncaria rhynchophylla* decoction, blood pressure of hypertensive patients begins to drop, with the best results appearing after ten days. With the blood pressure reduced, such symptoms as headache, dizziness, palpitation, shortness of breath, or insomnia also gradually reduce or in some instances disappear altogether. *Salvia miltiorrhiza* bunge is bitter and slightly cold, and its components enter the heart meridian and liver meridian. It can promote blood flow, regulate menstruation, remove blood stasis, relieve pain, cool blood, eliminate carbuncle, nourish the blood, and calm the nerves, thereby treating nerve stasis and soul occlusion. *Ligusticum chuanxiong* hort is pungent and warm. Its components enter the liver meridian, gallbladder meridian, and pericardium meridian. The main functions and indications of *Ligusticum chuanxiong* hort are to promote Qi, activate blood, dispel wind, and relieve pain. *Polygala tenuifolia* willd is warm, bitter, and pungent, and it can calm the nerves, increase intelligence, expel phlegm, and reduce swelling. Therefore, it can be used to treat "Heart-Yang Kidney-Yin Incoordination" induced insomnia and dreaminess, forgetfulness, palpitation, and trance. The Dazhui acupoint plus compound gouteng tincture precisely targets the combination of concussion and its syndrome. As an important acupoint on the human head, the temples are on both sides of the forehead in front of the ears, above the elongation of external canthus, and at the pitting of the two eyebrows. They are also divided into the Great Yang (left side) and Great Yin (right side). The main indications for Zoubo massage of the temples include headache and eyestrain, for which the effects of Zoubo massage can be significant. Zoubo-massaging of the temples can also stimulate the brain, boost the mind, relieve pain, and refresh the brain, thus keeping a subject's attention continuously focused. The Dazhui acupoint determines locations in the lower neck end and at the pitting of the seventh cervical spinous process. The main indication for Zoubo-massaging of the Dazhui is a stiff neck. Low-frequency Zoubo treatment can inhibit the transmission of pain along the neck sensory nerve fibers; therefore, it can also significantly reduce insomnia and dreaminess, forgetfulness, or trance<sup>14–20</sup>.

According to the clinical results of this study, the combined treatment of traditional Chinese medicine and Western medicine showed much better efficacy than Western medicine alone in treating CC sequelae and manifested the "optimal combination of traditional Chinese medicine and Western medicine." The Zoubo instrument (Japan), traditional Chinese medicine complex, and acupoint massage were organ-combined, thus generating significant positive effects; therefore, the efficacies between the treatment group and the control group were different. The treatment group not only had a higher cure rate but also a shorter treatment course. Furthermore, the ZB-CT treatment was safe, comfortable, and had few side effects, so it was worthy of further study and clinical recommendations<sup>21–26</sup>. Our plans were to carry out animal experiments to further demonstrate its scientific theory and clinical feasibility<sup>27</sup>.

The theoretical significance of this study is found in organ-combining acupuncture and traditional Chinese medicine at a localized body site, which resulted in greater comfort and enhanced clinical effects<sup>28, 29</sup>.

## REFERENCES

- 1) Alt Murphy M, Resteghini C, Feys P, et al.: An overview of systematic reviews on upper extremity outcome measures after stroke. *BMC Neurol*, 2015, 15: 29. [[Medline](#)] [[CrossRef](#)]
- 2) Bacigaluppi M, Pluchino S, Martino G, et al.: Neural stem/precursor cells for the treatment of ischemic stroke. *J Neurol Sci*, 2008, 265: 73–77. [[Medline](#)] [[CrossRef](#)]
- 3) Besios T, Nikolaos A, Vassilios G, et al.: Comparative reliability of the PEDI, GMFM and TUG tests for children with cerebral palsy. *J Phys Ther Sci*, 2013, 25: 73–76. [[CrossRef](#)]
- 4) Cooke J, Zacko JC: Post-concussion Syndrome, Persistent Symptomatic Concussion, Related Sequelae, and Treatment of Mild Closed Head Injury. In: Slobounov SM, Sebastianelli WJ (ed) *Concussions in Athletics*. Springer New York, 2014, pp 393–406.
- 5) Jun HJ, Kim KJ, Chun IA, et al.: The relationship between stroke patients' socio-economic conditions and their quality of life: the 2010 Korean community

health survey. *J Phys Ther Sci*, 2015, 27: 781–784. [[Medline](#)] [[CrossRef](#)]

- 6) Huang Q, Li D, Yokotsuka N, et al.: The intervention effects of different treatment for chronic low back pain as assessed by the cross-sectional area of the multifidus muscle. *J Phys Ther Sci*, 2013, 25: 811–813. [[Medline](#)] [[CrossRef](#)]
- 7) Kang H, Jung J, Yu J: Effects of hippotherapy on the sitting balance of children with cerebral palsy: a randomized control trial. *J Phys Ther Sci*, 2012, 24: 833–836. [[CrossRef](#)]
- 8) Yu J, Kang H, Jung J: Effects of modified constraint-induced movement therapy on hand dexterity, grip strength and activities of daily living of children with cerebral palsy: a randomized control trial. *J Phys Ther Sci*, 2012, 24: 1029–1031. [[CrossRef](#)]
- 9) Park SW, Lee HS, Kim JH: The effectiveness of intensive mobilization techniques combined with capsular distension for adhesive capsulitis of the shoulder. *J Phys Ther Sci*, 2014, 26: 1767–1770. [[Medline](#)] [[CrossRef](#)]
- 10) Tatsumi T: Relationship between adaptation after returning to competition and psycho-behavioral attitudes during injury rehabilitation. *J Phys Ther Sci*, 2014, 26: 1813–1823. [[Medline](#)] [[CrossRef](#)]
- 11) Kurata S: Extracellular and intracellular pathogen recognition by *Drosophila* PGRP-LE and PGRP-LC. *Int Immunol*, 2010, 22: 143–148. [[Medline](#)] [[CrossRef](#)]
- 12) Lee YK, Kim JS, Lim SC: Effects of atractylodis rhizoma pharmacopuncture on an acute gastric mucosal lesion induced by compound 48/80 in rats. *J Pharmacopuncture*, 2012, 15: 12–17. [[Medline](#)] [[CrossRef](#)]
- 13) Luther N, Niogi S, Kutner K, et al.: 143 Diffusion tensor and susceptibility-weighted imaging in concussion assessment of national football league players. *Neurosurgery*, 2012, 71: 558–559. [[CrossRef](#)]
- 14) Makdissi M, Darby D, Maruff P, et al.: Natural history of concussion in sport: markers of severity and implications for management. *Am J Sports Med*, 2010, 38: 464–471. [[Medline](#)] [[CrossRef](#)]
- 15) McCauley SR, Wilde EA, Barnes A, et al.: Patterns of early emotional and neuropsychological sequelae after mild traumatic brain injury. *J Neurotrauma*, 2014, 31: 914–925. [[Medline](#)] [[CrossRef](#)]
- 16) Moriarity JM, Pietrzak RH, Kutcher JS, et al.: Unrecognised ringside concussive injury in amateur boxers. *Br J Sports Med*, 2012, 46: 1011–1015. [[Medline](#)] [[CrossRef](#)]
- 17) Olsson KA, Lloyd OT, Lebrocque RM, et al.: Predictors of child post-concussion symptoms at 6 and 18 months following mild traumatic brain injury. *Brain Inj*, 2013, 27: 145–157. [[Medline](#)] [[CrossRef](#)]
- 18) Pocoski J, Benjamin K, Michaels LA, et al.: An overview of current trends and gaps in patient-reported outcome measures used in haemophilia. *Eur J Haematol*, 2014, 93: 1–8. [[Medline](#)] [[CrossRef](#)]
- 19) Rieger BP, Lewandowski LJ, Callahan JM, et al.: A prospective study of symptoms and neurocognitive outcomes in youth with concussion vs orthopaedic injuries. *Brain Inj*, 2013, 27: 169–178. [[Medline](#)] [[CrossRef](#)]
- 20) Rogove J: Anxiety, disorders and evidence-based practice: the role of broadband self-report measures of personality in diagnosis, case conceptualization, and treatment planning. Springer N Y, 2013, 24: 163–188.
- 21) Schmidt AT, Li X, Hanten GR, et al.: A longitudinal investigation of sleep quality in adolescents and young adults after mild traumatic brain injury. *Cogn Behav Neurol*, 2015, 28: 53–62. [[Medline](#)] [[CrossRef](#)]
- 22) Shuttleworth-Edwards AB, Whitefield-Alexander VJ: Cerebral damage in diving: taking the cue from sports concussion medicine. *S Afr J Sports Med*, 2012, 24: 28–29.
- 23) Slobounov S, Gay M, Johnson B, et al.: Concussion in athletics: ongoing clinical and brain imaging research controversies. *Brain Imaging Behav*, 2012, 6: 224–243. [[Medline](#)] [[CrossRef](#)]
- 24) Struchen MA: Social Communication Interventions. In: Sherer M, Sander AM (ed.), *Handbook on the Neuropsychology of Traumatic Brain Injury*. New York: Springer New York, 2014, pp 213–231.
- 25) Tobón GJ, Youinou P, Saraux A: The environment, geo-epidemiology, and autoimmune disease: rheumatoid arthritis. *J Autoimmun*, 2010, 35: 10–14. [[Medline](#)] [[CrossRef](#)]
- 26) Velstra IM, Ballert CS, Cieza A: A systematic literature review of outcome measures for upper extremity function using the international classification of functioning, disability, and health as reference. *PM R*, 2011, 3: 846–860. [[Medline](#)] [[CrossRef](#)]
- 27) Ward L, Stebbings S, Sherman KJ, et al.: Establishing key components of yoga interventions for musculoskeletal conditions: a Delphi survey. *BMC Complement Altern Med*, 2014, 14: 196. [[Medline](#)] [[CrossRef](#)]
- 28) Jang SH, Yong HK: Cortical activation changes associated with motor recovery in mild hemiparetic patients with corona radiata infarct. *J Phys Ther Sci*, 2010, 22: 141–147. [[CrossRef](#)]
- 29) Han JT, Lee JH: Effects of kinesiology taping on repositioning error of the knee joint after quadriceps muscle fatigue. *J Phys Ther Sci*, 2014, 26: 921–923. [[Medline](#)] [[CrossRef](#)]