

# ***Current Status and Outlook of the Study on the Treatment of Mental Developmental Disorders by Tou Jin Acupuncture***

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**Abstract:** Intellectual Developmental Disorder (IDD) is a neurodevelopmental disorder, which usually causes great physical and psychological harm and economic pressure to children and their families. This paper focuses on reviewing the literature on the treatment of IDD with head-jin acupuncture (Jiao's head acupuncture + Jin's three acupuncture) over the past 10 years at home and abroad, analysing and summarising the important role of head-jin acupuncture in the treatment of IDD and its exact efficacy; and the combination of head-jin acupuncture with other traditional Chinese medicine therapies enriches the means and methods of its treatment, and also provides a new way of thinking for the treatment in the future, which is of broader significance. It also provides us with new ideas for future treatment and has a broader development prospect.

## **1. Introduction**

Intellectual Developmental Disorder (IDD), also known as mental retardation, mental retardation, intellectual disability, is two kinds of deficits that begin in the developmental period with cognitive impairments in the three major domains of thinking, society, and practice, and social adaptive disorders, which can be diagnosed only if the intelligence quotient (IQ) and social adaptive ability (SAB) are jointly deficient [1]. IDD is highly heterogeneous in its clinical manifestations, with cognitive, verbal, affective-volitional, and social adaptive deficits lagging significantly behind children of the same age in terms of maturation and functioning, and may be accompanied by or secondary to psychiatric or somatic disorders. It can be manifested as an isolated symptom or in conjunction with congenital malformations or other neurological conditions such as epilepsy, sensory disorders and autism spectrum disorder (ASD). Studies have shown [2] that the causes are complex, varied and heterogeneous, with 1-3% of the population having varying degrees of mental retardation. According to AAIDD and WHO, the prevalence of IDD in children is 1% to 2%. According to this rate, there are more than 13 million children with IDD in China, which is a heavy burden for families and society [3].

Modern medicine believes that the etiology of IDD is complex and varied, which is mainly divided into biomedical factors and psychosocial and cultural factors, and its treatment is also mainly divided into etiological treatment and symptomatic treatment. In this paper, we have compiled the clinical research literature on the treatment of intellectual developmental disorders with head-jin acupuncture (Jiao's head acupuncture + Jin's three acupuncture) published at home and abroad in the past 10 years, which shows that the clinical application of Chinese medicine therapy based on head-jin acupuncture is effective, and it is now summarised as follows.

## 2. Etiology and pathogenesis of IDD

There is no concept of "intellectual development disorder" in the name of Chinese medicine, and it is mostly categorised as "five delays" and "five softness", both of which have been described in the literature of the past dynasties. Ancient medical practitioners have a certain understanding of paediatric intellectual developmental disorders very early. As early as in the book "Cranial Chimney Classic", there is a record of "late walking". In the book "Origin and Condition of All Diseases", there is "no growth of teeth", "unable to walk for several years", "no growth of hair", and "unable to speak at the age of four or five". On this basis, later medical doctors also put forward their own insights. Qian Yi described the "five delays" in the book "Straight Tips on Paediatric Drugs" as "growing up does not work, walking is soft, teeth do not grow for a long time, the birth is not solid, the hair does not grow for a long time, and the birth is not black!". Yuan Dynasty physician Zeng Shirong in the "live young heart book" recorded "head and hands and feet body soft, is the name of the five soft" head and hands and feet body soft, is the name of the five soft. The Qing Dynasty Chen Fuzheng wrote "young young integrated" in the "soft head, soft body, soft mouth, soft muscles, soft hands and feet" that is, "five soft", which are the description of the "five soft" [4].

According to Chinese medicine, the causes of this disease can be divided into two aspects: congenital insufficiency and acquired malnutrition. (1) Innate factors: "Zhang's medical passages - baby door" pointed out that the cause of the disease "are all foetal weakness, good from the parents of insufficient essence and blood, kidney qi weakness, can not be glorified and nourished and so on", blamed on the innate factors [5]. Parents' essence and blood deficiency, or improper regulation during pregnancy, mental, living, diet, medication and other factors affecting the fetus, damage to the fetus Yuan Zhengqi, or high age to get a child, or abortion does not become a fetus, the innate essence is not enough, the medulla and brain are not full, the organs and qi is weak, the muscles and bones are not nourished into the five delayed, the five soft; (2) Acquired factors: the main factors include difficult labor, birth injury, so that intracranial hemorrhage, or the birth of the placenta in the process of premature detachment, the birth of a baby after (2) Acquired factors: mainly include difficult labour, birth injury, intracranial haemorrhage during delivery, placental abruption during birth, postnatal improper care, asphyxiation, poisoning, damage to the brain marrow, blockage of the brain; or warm-heat disease, phlegm fire, phlegm and turbid obstruction, obscuring the clear orifices, the heart and brain, the gods are out of control, and limb activity is dysfunctional; or insufficient milk and food, feeding disorders, resulting in spleen and stomach deficiencies, weakness of the qi and blood, and the lack of the essence and marrow, which results in growth and development disorders.

## 3. Mechanism of action of cephalic acupuncture in the treatment of IDD

Head jin acupuncture is used as the preferred method of acupuncture for the treatment of cerebral origin diseases. Studies have shown that cephalic needling is mainly used to treat cerebral disorders by increasing cerebral blood flow and improving cerebral microcirculation; promoting the expression of neurotrophic factors; reducing immune-inflammatory responses; and exerting effector neural pathways[6]. The common clinical symptoms of children with IDD are delayed language development

and impaired verbal-emotional communication, and most modern neurology has attributed the problem of language development to damage to the language centre, which is mainly divided into the motor speech centre (Broca's area) and the sensory speech centre (Wernhertz area). It is mainly divided into motor speech centre (Broca's area) and sensory speech centre (Wernicke's area), and the projection area division of Jiao's head acupuncture in the first area of speech corresponds to the location of Broca's area, which achieves the topological overlap between cortical function location and traditional meridian theory. Huang Longsheng found that there is a complex quantitative and effective relationship between Jin's three needles for the activation of the OT system, including the influence of related neuroenergetic synapses such as oxytocinergic synapses and GABAergic synapses of amygdala neurons, and the modulation of Arc Synaptic Plasticity Regulatory Genes and Per Sleep Rhythm Factor [7]. It can be seen that the OT level can be regulated by Jin San-needle acupuncture, which can treat the level of social interaction and cognitive behavioural deficits in children with IDD, and also reduce the possibility of withdrawal, resistance and even aggression that may occur in the children's social interaction behaviours.

## 4. Application of Head Jin Needle in IDD Treatment

### 4.1 Jiao's Head Acupuncture

According to Chinese medicine, "the head is the meeting of all yangs", "the head is the capital of essence" and "the brain is the capital of the spirit", which emphasises the position of the brain as the centre of the body's mental activities and is in charge of thinking and consciousness. "Jiao's head acupuncture" was firstly proposed by Professor Jiao Shunfa of Shanxi Province in 1971 based on the theoretical basis of cerebral cortex function positioning [8], and it is a kind of head acupuncture therapy using acupuncture as a means to treat various diseases, which is often applied to cerebral disorders in clinical practice. Jiao's head acupuncture is based on the physiology and anatomy of the brain and nerves as the theoretical basis, according to the functional positioning of the cerebral cortex on the scalp to the projection of the projected area to divide its stimulation zone, through the nerve, meridian conduction induction stimulation, can achieve the whole body to adjust the internal organs of the body and qi and blood in order to prevent and treat diseases.

Fan Wei et al. [8] observed the clinical efficacy of Scalp Acupuncture combined with Zhi-Jiu Acupuncture in the early treatment of children with intellectual disabilities. According to the order of consultation, the children were divided into a treatment group of 50 cases and a control group of 64 cases. The treatment group received Scalp Acupuncture combined with Zhi-Jiu Acupuncture plus motor rehabilitation therapy, while the control group received motor rehabilitation therapy alone. The results showed that after treatment, the DQ values of the five functional areas of gross motor, fine motor, language ability, adaptive ability, and social ability, as well as the total DQ value, in both groups of children were significantly higher than pre-treatment. Tang Leping [9] observed the effect of Jiao's head acupuncture with Liu's paediatric tuina on the intellectual development of children with mild mental retardation. 80 children with mild mental retardation were randomly divided into 40 cases in the treatment group and 40 cases in the control group, and Liu's paediatric tuina was used together with Jiao's head acupuncture on the basis of basic treatment in the treatment group, while the control group used ordinary tuina together with Jiao's head acupuncture on the basis of basic treatment, and the children in the treatment group were better than those in the control group in terms of the DQ and the total DQ. The children in the treatment group showed significant improvement in DQ, adaptability, gross motor, fine motor, language, and personal-social areas compared with the children in the control group. In conclusion, Jiao's head acupuncture treatment for children with IDD mainly selects Jiao's language areas 1, 2 and 3 neuroreflex regions, and is supplemented by acupuncture and acupoints of the internal organs and meridians and tuina therapy according to the differences in the accompanying

symptoms of the children, as well as rehabilitation training.

## 4.2 Jin's Three Acupuncture

Jin's three needles, founded by Professor Jin Rui, is a complete set of academic theory system of acupuncture treatment, which is used to treat a variety of diseases in clinical practice, and has a very good efficacy in the treatment of psychoemotional diseases. The main acupuncture points for the treatment of children with IDD are: Zhi San Acupuncture, Si Shen Acupuncture, Temporal Acupuncture and Brain Acupuncture. Zhi San Needle consists of Shen Ting and Ben Shen, and there are three needles on the left and right, both of which contain the meaning of "Shen", indicating that "Shen" is the source of emotion and intelligence, and it is located in the front part of the head, the cephalic cortex on the surface of the frontal lobe of the brain, which is mainly responsible for emotion and intelligence, and therefore it can be used for treating diseases of emotion and intelligence disorders. Therefore, it can be used to treat emotional and intellectual disorders. The Four Divine Needles are located 0.5 inches outside the Four Divine Cong Points, which project a wider area of the brain, and are centred on Baihui, which strengthens the effect of raising Yang Qi. Brain three needles are located at the back of the head, all containing the word "brain", and are used to treat a variety of cerebral diseases. The Hand Intelligence Acupuncture, located in the Heart Meridian and Pericardium Meridian, has the effect of nourishing Yin and clearing fire, tranquilising the heart and calming the mind, and is used to treat mental retardation combined with hyperactivity and inattention. The combination of the above three needles can enhance the function of opening the orifices and awakening the mind, and benefit the intellect and brain.

Wang Xiaobei [10] selected 64 cases of children with IDD with liver and kidney insufficiency and divided them into a treatment group and a control group according to the random number table method, with 32 cases in each group. The control group was given comprehensive treatment of neurorehabilitation, and the treatment group was treated with Jin San-needle combined with Yi Zhi-Fill-Medullary Tui-Na method for three courses of treatment. The results showed that Jin San-needle combined with Yi Zhi-Fill-Medullary Tui-Na method not only significantly improved the intellectual level, motor ability, and daily life ability of IDD children, but also adjusted the levels of serum NSE and monoamine neurotransmitters. Zhou Taocheng [11] and others randomly divided 60 children with IDD into a control group and an observation group. The control group was treated with conventional cognitive-perceptual dysfunction training and transcranial magnetic therapy, while the observation group was treated with Jin San-needle therapy on the basis of the control group, and found that Jin San-needle therapy combined with transcranial magnetic therapy could further improve the IQ of the children, and reduce the concentrations of serum NSE and TNF- $\alpha$ , and improve cognitive function. It can also reduce the concentration of serum NSE and TNF- $\alpha$  and improve cognitive function. Tong Guanglei [12] observed the effects of Jin's three-needle acupuncture combined with "Tongdu zhongshen" acupuncture on the developmental level and daily life ability of children with mental retardation. 60 cases of children with mental retardation were randomly divided into the observation group and the control group, and the control group was given 30 min of rehabilitation training and routine acupuncture, both of them were treated for 30 minutes once a day, six times a week, for a total treatment of three months. The observation group was given Jin three needles combined with "Tongdu zhongshen" acupuncture on the basis of the control group, in which the four divine needles, wisdom three needles, brain three needles and temporal three needles were left in the Jin three needles for 1 h, and the hand and foot wisdom needles were left in the Jin three needles for 30 min; the results of the study showed that the improvement of the DQ and ADL scores of the observation group was better than that of the control group. Huang Xiurong [13] et al. explored the effect of jin san-needle cephalic point needle retention combined with cognitive-perceptual disorder

training on the cognitive level of children with mental retardation, and found that jin san-needle cephalic point needle retention post-training can significantly improve the children's language comprehension, expression, and hand-eye coordination, attention, logical reasoning, and visual-perceptual ability, as compared with the ordinary acupuncture post-training. Liu Yutang [14] observed 30 cases of language disorders in children with mental retardation (IDD) treated with Jin San-needle as the main treatment with language training. 58 cases were randomly divided into treatment and control groups using randomised single-blind control, 30 cases in the treatment group were treated with Jin San-needle as the main treatment with language training, and 28 cases in the control group were given language training. The speech function of IDD children in the treatment group was significantly improved, and the overall clinical efficacy was better than that of the control group, indicating that the clinical efficacy of Jin's three-needle-based speech training in the treatment of language disorders in children with mental retardation is accurate. Wei Bo [15] and others selected 40 cases of microcephaly with mental retardation as the main manifestation, and measured the intelligence quotient (IQ) and social adaptability (IDQ) of each child before and after the treatment, and adopted a two-course treatment of Jin San Needle combined with acupoint injection, and found that the children's IQ and IDQ levels were significantly improved after the acupuncture treatment. In the treatment of intellectual developmental disorders, Jin San-acupuncture with corresponding therapeutic means can not only improve the symptoms of the children, but also effectively regulate the serum level and the corresponding neurotransmitters, and promote the neurodevelopment of the brain.

#### 4.3 Jiao's head acupuncture combined with Jin's three needles

Li Weifeng [16] observed the therapeutic effect of Jiao's head acupuncture combined with Jin's three acupuncture points in the treatment of paediatric cerebral palsy combined with mental retardation. 164 cases of paediatric cerebral palsy combined with mental retardation were selected, and were divided into observation group and control group according to the method of randomised numerical table, the control group was treated with conventional treatment, and the treatment group was treated with Jiao's head acupuncture combined with Jin's three acupuncture points on the basis of the control group, and the treatment was found to be more significant compared with the conventional treatment. After 6 months of effective treatment, it was found that the children in the observation group showed more significant improvement in gross motor function and intelligence level compared with the conventional treatment. Qi Fang [17] randomly divided 100 cases of paediatric cerebral palsy combined with mental retardation into 50 cases of treatment group and 50 cases of control group according to the order of hospitalisation. The treatment group was treated with Jiao's head acupuncture combined with Jin's three acupuncture points and the control group was not treated with acupuncture points, and it was found that Jin's head acupuncture combined with Jiao's head acupuncture points could improve the children's intelligence level and verbal communication ability.

### 5. Discussion and outlook

Intellectual developmental disorder (IDD) is a chronic and intractable disease, due to the complexity of its etiology and the lack of specific drugs in western medicine, early detection, diagnosis and treatment are particularly important, but difficult to achieve. The above literature and clinical studies have shown that the treatment of IDD with Cephalosporin needles is based on the principle of dredging the meridians and channels, opening the aperture and benefiting the intellect, and has the advantages of low side effects and high safety, which not only improves the symptoms of delayed language development and low cognitive level of the children, but also effectively promotes the neurodevelopment of the children's brain. Through reviewing the literature, the author found that the combination of acupuncture with transcranial magnetic stimulation, massage therapy, language



training, cognitive perceptual impairment training and other treatment modalities, and most of the studies focused on the synergistic effect of acupuncture and rehabilitation training, which proved that acupuncture can promote the clinical efficacy of the rehabilitation training, to help the children with IDD to improve the ability of daily life, and to reduce the burden of the children's families.

Despite the results achieved in the effectiveness of cephalic jin acupuncture in treating IDD, there are still some problems or deficiencies in clinical research: (1) lack of high-quality clinical studies, lack of rigorous research protocols, lack of sample size estimation in most studies, irregularities in the establishment of control groups, inconsistent standards of analysis of efficacy evaluation indexes, poor credibility of the data, low number of reported cases, lack of animal models, and low level of evidence-based medicine. It is recommended to develop relevant standards for acupuncture treatment of intellectual developmental disorders, and to carry out large-sample, multi-centre randomised controlled clinical trials to further clarify the effectiveness of acupuncture in the treatment of intellectual developmental disorders. (2) The acupuncture prescription for intellectual developmental disorders is fixed and single, and follow-up studies are recommended to standardise the criteria for acupuncture points for the different Chinese medicine types of intellectual developmental disorders, as well as the principles of acupuncture points, therapeutic operations and treatment protocols, and to establish a standardised treatment protocol for the treatment of intellectual developmental disorders with acupuncture. Jin acupuncture treatment of intellectual developmental disorders clinical guidelines. (3) intellectual developmental disorders treatment cycle is long, should be life-based, family-centred, set up an effective intellectual training mode and rehabilitation, and today's rehabilitation, special education, and standardised professional Chinese medicine integrated treatment research is relatively small, did not form a systematic and effective treatment method or system. (4) the efficacy of the assessment of a single, non-objective, should be combined with Age, etiology, other brain functions and modern rehabilitation evaluation should be combined to formulate a more comprehensive efficacy assessment standard; (5) There are ancient Chinese medical texts on the treatment of related diseases, which can be used to apply the essence of Chinese medicine's diagnosis and treatment to prepare tonics and proprietary Chinese medicines with recognised therapeutic effects, whereas at present, the Chinese medicinal preparations used in the clinic are mainly self-designed formulas or in-hospital preparations, and there is a lack of quasi-nominal Chinese medicinal preparations approved by the state with good therapeutic effects.

The current status of treatment is still far from our expectations and those of our families, and we need to increase the depth and breadth of research on TCM treatment of intellectual developmental disorders in the future. The author believes that the combination of Tou Jin acupuncture with other TCM therapies and modern rehabilitation education will be the main research idea and direction of the same industry in China in the next period of time, and we should continue to carry out in-depth observation, exploration and research to further enhance the clinical efficacy of TCM treatment of this disease, and I believe that there will be a broad prospect for development.

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## References

[1] Zou M, Sun H, Qiu Zhuoying, et al. A study on the terminology, diagnosis and classification of intellectual disability

- based on ICD-11 and ICF[J]. *Chinese Rehabilitation Theory and Practice*, 2019,25(01):1-5.
- [2] Patel D R, Cabral M D, Ho A, et al. A clinical primer on intellectual disability[J]. *Transl Pediatr*, 2020,9(Suppl 1):S23-S35.DOI:10.21037/tp.2020.02.02.
- [3] Jiang YF, Zhou WH, Luo FH. Research progress and insights of intellectual developmental disorders[J]. *Chinese Journal of Evidence-Based Paediatrics*, 2012,7(04):241-244.
- [4] Dai Yating. A retrospective study on the clinical efficacy of acupuncture and rehabilitation in the treatment of children with cerebral palsy and mental retardation[D]. *Hunan University of Traditional Chinese Medicine*, 2023.10.27138/d.cnki.ghuzc.2023.000096.
- [5] Wu YJ, Yan YJ, Xu RQ. Report of a case of paediatric cerebral developmental delay treated with six-flavour dihuang soup[J]. *China Combined Chinese and Western Medicine Paediatrics*, 2013,5(06):574-575.
- [6] ZHU Lu-Wen, LI Jia-Shuai, TANG Qiang, et al. Progress of clinical research on head acupuncture for the treatment of brain diseases[J]. *World Journal of Integrative Chinese and Western Medicine*, 2019,14(11):1616-1618.DOI:10.13935/j.cnki.sjzx.191133.
- [7] Huang, L.-S. Study on the efficacy and mechanism of Jin San-needle modulation of OT/OXTR to improve social behaviour in autism [D]. *Guangzhou University of Traditional Chinese Medicine*, 2023.10.27044/d.cnki.ggzuz.2023.000320.
- [8] Fan W, Wang R, Deng L, et al. Clinical efficacy study of Jiao's head acupuncture with Zhi Jiu acupuncture for early treatment of children with mental retardation[J]. *Chinese Journal of Child Health*, 2017,25(07):740-742.
- [9] Tang LP. Therapeutic effect of Liu's paediatric massage with Jiao's head acupuncture in the treatment of children with cerebral palsy accompanied by mild mental retardation[D]. *Hunan University of Traditional Chinese Medicine*, 2016.
- [10] Wang SB, Zhang L. Clinical observation on 32 cases of children with mental retardation with liver and kidney insufficiency certificate treated by Jin San acupuncture combined with Yi Zhi and marrow filling massage[J]. *Journal of Traditional Chinese Medicine and Paediatrics*, 2024,20(03):77-82.DOI:10.16840/j.issn1673-4297.2024.03.19.
- [11] Zhou Taocheng, Tong Guanglei, Cai Yunfei, et al. Therapeutic effect of transcranial magnetism combined with Jin-San acupuncture in the treatment of children with mental retardation[J]. *Liaoning Journal of Chinese Medicine*, 2022,49(01):158-161. DOI:10.13192/j.issn.1000-1719.2022.01.045.
- [12] Zhou Taocheng, Tong Guanglei, Liang Dong, et al. Clinical and mechanistic study on the treatment of mental retardation in children by "Tongdu zhongshen" acupuncture combined with Jin Sanqin[J]. *Chinese Acupuncture and Moxibustion*, 2021,41(07):751-755.DOI:10.13703/j.0255-2930.20201101-0003.
- [13] Huang Xurong, Yuan Qing, Luo Qiuyan, et al. Clinical efficacy observation on the treatment of paediatric mental retardation with Jin San acupuncture head point retention combined with cognitive perceptual disorder training[J]. *Chinese Acupuncture and Moxibustion*, 2015,35(07):651-656.DOI:10.13703/j.0255-2930.2015.07.004.
- [14] Liu YT. Thirty cases of language disorders in children with mental retardation treated with Jin San-needle based on language training[C]//: *Twenty-ninth National Academic Conference of Chinese Medicine Paediatrics and Training Course on "Prevention and Treatment of Pediatric Infectious Diseases with Traditional Chinese Medicine"*, Zhangjiajie, Hunan, China, 2012.
- [15] Wei Bo, Zhang Yi-Min, Zhang Yu-Qing, et al. Effects of "Jin San Jiu" combined with acupoint injection on IQ and ADQ in children with microcephaly[J]. *Chinese Journal of Integrative Medicine*, 2013,33(07):996-997.
- [16] Li Weifeng, Zhang Kewei. Treatment of 82 cases of paediatric cerebral palsy combined with mental retardation by Jiao's head acupuncture combined with Jin's three acupuncture points[J]. *Hunan Journal of Traditional Chinese Medicine*, 2020,36(04):87-88.DOI:10.16808/j.cnki.issn1003-7705.2020.04.034.
- [17] Qi F. Clinical study on the treatment of paediatric cerebral palsy combined with mental retardation by Jiao's head acupuncture combined with Jin's three-needle acupuncture point taking and distribution of needles[J]. *Clinical Research on Traditional Chinese Medicine*, 2015,7(26):45-46.