

Bringing ADHD into focus with non- pharmaceutical treatment

Dr Shin-Siung Jung





BRINGING ADHD INTO FOCUS WITH NON-PHARMACEUTICAL TREATMENT

Dr Shin-Siung Jung, of the Everspring foundation in Taiwan, has pioneered the use of sensory-motor integration training in children with attention-deficit/hyperactivity disorder (ADHD), as a non-pharmaceutical alternative treatment. The training comprises a series of exercises involving prone extension postures, which cause the activation of the neocortical association pathway in the prefrontal lobes. The results to date indicate that this treatment approach is highly effective in reducing the symptoms of ADHD.

Attention-deficit/hyperactivity disorder

Attention-deficit/hyperactivity disorder (ADHD) is a psychiatric disorder, which is first diagnosed in childhood. It is characterised by an array of symptoms including problems with motor skills, hyperactivity, inattention, difficulties focusing on and completing tasks (particularly those which are perceived as not enjoyable, such as school work), impulsive behaviour, disruptive behaviour and difficulties in forming relationships. Not every sufferer will display all of these symptoms, and in order to be diagnosed, symptoms must be present for at least six months, must be significantly greater than what would be expected for children of a similar age and must be fully manifested before or at the age of 12 years. The social and academic consequences of ADHD can be significant, and the condition can also create a variety of problems for teachers and parents of affected children, who may demonstrate disruptive behaviours in the classroom and at home.

These problems and their consequences can even manifest into adulthood. A study of adult men who had been diagnosed with ADHD as children found that they tended to have poorer outcomes in terms of social, economic and educational considerations, compared with adult men who were not previously diagnosed with ADHD.

The causes of ADHD are still not fully understood. It appears to be a combination of genetic and environmental factors. It is also believed that brain trauma can play a role, in certain cases, as can foetal exposure to alcohol or tobacco smoke during pregnancy.

Current treatments for ADHD

ADHD is typically treated using a combination of lifestyle changes, drug therapy and counselling, either alone or together. As the disorder presents itself differently in different patients, there isn't

a 'one size fits all' solution to reducing the number and severity of its symptoms. Behavioural therapies form the basis of many counselling interventions and family therapy is also sometimes employed to train parents and guardians in the best way to deal and interact with a child experiencing ADHD. Commonly used drugs include stimulants such as Ritalin and Adderall to increase focus and attention span, and antidepressants such as Atomoxetine, a selective serotonin reuptake inhibitor. Drug therapy typically produces an improvement in symptoms, such as enabling increased academic performance, for the majority of treated patients in the short term, but whether it is effective in the long term is unclear. In addition, the use of stimulant drugs carries the risk of addiction or dependency. Finally, lifestyle changes, such as undertaking an exercise regimen, have been shown to improve symptoms in children with ADHD. Regular physical exercise, such as aerobic cardiovascular exercise has been shown to

improve focus and reduce some of the motor deficits present in ADHD. In addition, regular exercise as a therapy for ADHD has the added benefit of not producing adverse side-effects, while improving overall physical fitness, and so is a promising complementary therapy.

Sensory-motor integration training – rationale and application

Sensory-motor integration training is another promising therapeutic approach for children with ADHD. This training is based on the work of Dr Anna Jean Ayres of Southern California University, who posited that the integration and processing of sensory signals derived from the body (such as touch or movement) can greatly affect phenomena and abilities such as behaviour, emotional responses, learning and motor activity. Dr Ayres studied how the brain integrates visual, tactile, auditory, vestibular and kinaesthetic inputs in the brain stem. This information, which arrives in huge amounts, is processed in the brain stem and impulses are sent to the body and limbs and also to higher cortical centres for further processing. If this integration and processing is not efficient or is dysfunctional, this can result in sensory over-sensitivity or poor motor skills and can underlie learning difficulties and poor social abilities. Sensory integration theory is used as a means of assessing and designing treatments for people, who, within this frame of reference, are considered to have a dysfunction in sensory processing and/or sensory integration. An underlying principle of sensory integration training is that such sensory difficulties affect people with autism type disorders and some individuals with learning difficulties, and that sensory-motor integration training can be utilised to target and improve sensory integration and processing. Such techniques have been shown to address a variety of symptoms experienced by such individuals.

Dr Shin-Siung Jung tells Scientia how he first learnt how to apply the technique and how he brought it to Taiwan: 'In 1983 I visited Dr Ayres' clinic in Southern California. On coming back to Taiwan, I applied to Dr Mau Dien-Wun, Chief of Education of the Bureau of Taipei Metropolis, to establish a Sensory Integration Therapy room in a school, to be used for physical therapy by Physical Therapists from hospitals of the Taipei Metropolis. The Physical Therapists used the room for about one year with one training session per week on Saturday afternoons, without obvious or great effects.'

'These accidental findings alerted me to the utility of this technique for ADHD'



Soon after, Dr Jung discovered that the technique could be extremely effective in treating children with ADHD. 'Some parents of children with ADHD, who demonstrated the classic symptoms of hyperactivity and poor physical coordination, asked if their children could use the room,' he explains. 'In the room the children had discovered that they liked to play in a prone extension posture on scooter boards (a movable board with wheels) using a dodge-ball, during their midday resting interval. I was in charge of how to use the room and after discussion with the parents, I decided that under parental supervision, those children would be allowed to play dodge ball in the room, in the manner described above. The children played in the prone extension posture in two groups passing the ball between group members, from 8.00am to 8.40am before their school classes, from Monday through to Friday. Within two weeks of performing these exercises for 40 minutes daily before lectures, the supervising parents told me that these students became quieter, displayed more concentration in class, and wrote their home work with better handwriting. They also reported reduced levels of shouting and

social withdrawal. Their teachers reported the same findings. These accidental findings alerted me to the utility of this technique for ADHD.'

Dr Jung's results to date

Spurred by these promising, albeit preliminary results, Dr Jung and his team have applied the technique in larger, scientifically rigorous studies to more accurately determine the effectiveness of sensory-motor integration training in children with ADHD. In the latest study, a total of 94 grade school students with ADHD, who ranged from 7.5 to 10.1 years when they began treatment, were assessed before and after three months of sensory-motor integration training. The children undertook a variety of exercises while lying prone on a plywood scooter board mounted on four wheels. The exercises included pushing a ball against a wall, passing a ball to an adult in a sitting position and 'walking' on their hands. The duration of the exercises increased consistently during the treatment period, to build up the strength and ability of the children gradually. The children



were assessed using a battery of tests. The test results derived from observations and records made by their parents and teachers, which measured a variety of ADHD metrics such as academic performance, social interactions and motor function.

The results indicate that the exercise regimen significantly improved ADHD symptoms in the children who took part in the trial, with the exception of children who experienced temper tantrums as a result of cold or influenza during the testing period. Children who took part in more exercise sessions per week had greater test scores compared with those who undertook less exercise. Children demonstrated an improvement of 80% or over on nine items on the Teacher Rating Scale – a test assessed by the teachers of the children. These nine behaviours were ‘attack behaviour’, ‘clumsy movements’, ‘very clumsy at manual labour in school’, ‘difficulty with dictation or listening and writing’, ‘impulsive and irritable’, ‘creates chaos during class’, ‘easily distracted and poor concentration’, ‘reacts strongly to the touch of others’, and ‘frequently forgets to bring books or reports to classes’. When all the items in the Teacher Rating Scale were taken into account the mean total improvement was a whopping 72% ± 18%.

‘These students became quieter, displayed more concentration in lectures, and wrote their homework with better handwriting’

The team has also previously shown that the sensory-motor integration training has measurable effects on the brains of children with ADHD. Impressively, in a study they undertook in 2006, it was shown that the prefrontal lobes of students with ADHD demonstrated very limited activation when compared with healthy controls, but that after 3 months of sensory-motor integration training the scans of ADHD students were much closer in appearance to those of the healthy controls.

Subheading: Future outlook

The results generated by the research group to date have been extremely promising. However, Dr Jung would like to conduct a larger double blinded cross-over study, to more accurately assess the effectiveness of the sensory-motor integration training treatment approach in ADHD, and also to examine in more detail the mechanism underlying its effect on the symptoms of ADHD.

Dr Jung would also like to examine the possibility of using sensory-motor integration training to treat language and speech disorders in children. Language disorders occur when children have trouble understanding or using words in context. This can lead to difficulties in expressing or communicating ideas, problems with understanding or following instructions and difficulty in learning new concepts. The team have already observed some improvement in children with dysarthria who have been treated with sensory-motor integration training, and who haven’t received speech therapy. Dysarthria is typically characterised by motor deficits in the muscles that control speech, making audible and intelligible speech a challenge. Now, Dr Jung would like to assess if the technique can be used to treat children who have trouble understanding the meaning of words. ‘We have a new language disorder checklist, and are waiting to accumulate new data. We also plan to examine vestibular dysfunction causing language disorder.’ Dr Jung explains.

Hopefully in the near future, sensory-motor integration training will become a mainstream treatment option recommended by healthcare professionals. Presenting parents with the option to choose a healthy and drug-free treatment for their kids suffering with ADHD or language disorders, represents a huge leap forward for the future management of these conditions.

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Meet the researcher

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Dr Shin-Siung Jung received his MD from Kaohsiung Medical University in Taiwan. He then went on to work at the National Taiwan University Hospital Neuropsychiatry Child Mental Health Center. Later he moved to the United States, where he took a post at Houston Texas Medical Center, and worked in the Department of Neurology, Baylor College of Medicine for three years. Upon returning to Taiwan he worked at St. Mary’s Hospital of Lodung, as Chief physician of Neurology. He has also since held positions at National Taiwan University Hospital, and Taiwan Adventist Hospital.

In 1989, he founded the Everspring Foundation, which specialises in treating learning disabilities and ADHD in children through the use of sensory-motor integration. Dr Jung has published a total of 30 papers and 5 books.

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Dr Mau Dien-Wun, Chief of Education Bureau of Taipei Metropolis. Later being promoted to Chief Principal of Taipei University, and Chief Trustee of Everspring Foundation.

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In 1989, Dr Shin-Siung Jung donated 1000000 New Taiwan Dollar for the establishment of Everspring Foundation and selected Dr Mau Dien-Wun to be Chief Trustee for 25 years. Later Dr Jung donated 500000 to 200000 each years, as general expenditure of Foundation.

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