



Therapeutic Eurythmy—movement therapy for children with attention deficit hyperactivity disorder (ADHD): a pilot study

Magdalena Majorek^{a,*}, Tobias Tüchelmann^b, Peter Heusser^c

^aTalstrasse 381, Himmelried, 4204, Switzerland

^bFreiburg im Br., Germany

^cDepartment for Anthroposophic Medicine, Institute for Complementary Medicine KIKOM, University of Bern, Switzerland

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Summary This paper considers Therapeutic Eurythmy (TE) as a possible therapy for children with attention deficit hyperactivity disorder (ADHD).

ADHD manifests as a complex psychological disturbance in which deficit of attention such as forgetfulness or distraction is the main symptom. It would seem that a growing number of children seem to be affected by this syndrome and an increasing number of alternative approaches to treatment are being sought.

Therapeutic Eurythmy is a movement Therapy in the context of anthroposophical medicine. As a holistic therapy TE affects both physical and spiritual aspects of illness. TE entails the practice of movement exercises learned from a trained therapist.

In this exploratory study, the effects of TE on behavioural functioning were examined.

This paper addresses five single cases where the therapy induced positive changes to client's attention span, concentration, tempo of work and motor skills such as coordination, dexterity and social behaviour. Standard psychological tests parameters for movement, and for attention were used to assess aspects of performance.

A positive shift was observed with reference to concentration and development of movement skills. Results were less pronounced but showed positive improvements on working speed and social behaviour problems. Hyperactivity also diminished to some extent. Generally, children were considered to be more mature in their development after therapy. The results of these case studies suggest that TE may be helpful for children with ADHD. However, more systematic research is warranted.

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Introduction

Attention deficit hyperactivity disorder (ADHD)

ADHD belongs to an area of psychological disturbances in which the deficit of attention is the main

symptom. Remschmidt¹ and Sass² describe key characteristics of this syndrome to be lack of attention (forgetfulness, distraction), impulsiveness (rash, risky behaviour), and hyperactivity (restless activity); restlessness does not always occur.

From a psychological perspective, attention is a cognitive strategy,³ with effectiveness determined by the ability of an individual to suppress conflicting or disturbing activity, to plan and persevere in their goal (e.g. by self-instructional strategy).

*Corresponding author. Tel./fax: +41-61-741-15-71.

E-mail address: magdalena.majorek@tiscalinet.ch

(M. Majorek).

Additionally, an ability to focus on the task at hand and to pursue it even if not perceived as interesting is an important characteristic.

A disorder of attention can present as a disorder of concentration, as a performance disorder, or as an attention-deficit syndrome.

There are many theories about causes of the deficit. Lauth⁴ suggests it is a combination of biologically determined reactivity of the nervous system, inability to self-regulate and environmental disturbances. Children who cannot concentrate, are restless and evoke negative reactions of the environment can initiate perceptions of social rejection. Repeated experiences of failure at school combined with the vulnerability of the nervous system are thought to create a negative perception evoking compensatory behaviour, for example, aggressive clown behaviour or dreamy, lonely and depressive states. In order to reduce such symptoms, the creation and maintenance of a supportive and caring home environment would seem to be significant. Children must have a feeling of being accepted, and be able to develop trusting relationships and a belief that there are ways in which they can be helped. This situation can be rather difficult to achieve where parents exhibit problems similar to their children. ADHD problems appear not only limited to childhood and family dynamics may influence may cause the condition to persist.

Therapy

Conventional treatment of children with ADHD

There are many different therapy forms used for the children with ADHD. The most widespread one is the medicinal treatment using the drug Ritalin, which can be effective in certain cases as an immediate remedy.^{5,6} Ritalin^R (Methylphenidate) must be taken at least once a day before going to school, since it is effective in suppressing the symptoms for only a few hours. It is typically given in a dosage of 1 mg/kg body weight; however, very often a more individual dosage is necessary, depending on symptoms. For the same reason, it does not offer a permanent cure. The children usually have to take it until puberty. In addition it is notable that only 10–20% of children appear to react positively to Ritalin and side effects can manifest in the form of loss of appetite, sleeping problems, mood instability, headache, abdominal pain, dizziness, rebound hyperactivity after effect loss, triggering or aggravation of existing tics, transient growth inhibition.⁷ In Switzerland, Ritalin is the predominately given drug against ADHD. In a

few cases it is replaced or complemented by Tofranyl^R (Tryptizole), especially in cases of strong impulsivity and sleeping problems. However, over dosages are quickly reached and can lead to severe side effects, e.g. extra pyramidal motor problems. It is therefore important to look for other therapeutic measures to treat ADHD.

A review of the literature between 1963 and 1998, identified 23 different types of therapy associated with the treatment of ADHD.⁸ This indicates the complexity of the problem. The most popular non-medicinal therapies are occupational therapy,⁹ play therapy³², sensory integration,¹⁰ and kinesiology¹¹ and these have often been used in combination with the medicinal therapy. Diet modification and a restriction in consumption of foodstuffs containing phosphates can also help ameliorate ADHD symptoms.

Movement therapies

Despite growing acceptance of movement as therapy, there is still no scientifically based system of movement therapy. Movement therapy is based, like many pedagogical interventions, on sensory-motor activity.¹² In 1975, Eggert¹³ was able to demonstrate that psychomotor treatment could reduce perceptions of fear, frustration and aggression in children with selective ability disturbances.

More recently in 1998, the first congress on movement therapy in Germany¹⁴ has increased acceptance of the value of movement therapy in relation to ADHD. The latest treatment of ADHD propagates sport as an alternative to prescribing Ritalin.¹⁵ This approach advocates body training and walks in natural surroundings such as gardens or woods every day. It is claimed that this can enhance cognitive processes and free tensions in feelings.

Cognitive strategies therapies

More recently, interest has focused upon the processes that regulate human directional behaviour. By identifying and creating cognitive strategies, an individual can be helped to achieve their goals more easily. Barkley⁵ has suggested a self-regulation strategy which facilitates a component of will or free determination. Thus, the development of attention is promoted through the development of behavioural inhibition whereby disturbing impulses are suppressed.

The deficiencies in the development, structure, and function of prefrontal cortex and its connections with other brain regions, especially with the striatum, are assumed to be the reason why there is a lower behavioural inhibition in children with ADHD.^{5,16} Such a theory however, relies on

mechanisms that are acknowledged or perceived to be deficient in the child, and it leaves it little scope for monitoring the effectiveness of any strategies that are introduced.

In this respect, movement therapy offers a number of advantages. It promotes outer motor activity that is relatively easy to control by a child with ADHD, and the public character of the movement enables a relatively direct control over the adequacy of performance.

The central question is whether one can expect improvement in motor skills to lead to enhanced cognitive performance such as increased attention span?

There is however, a growing body of evidence that motor training results in development of specific cortical structures related to it.^{17–19} For instance, the training of a hand movement can result in cerebral changes. There is also evidence indicating a relationship between motor training and cognitive performance.^{20–22} Thus, movement therapy may have a beneficial effect on some forms of cognitive performance, possibly via transfer of morphological and/or functional neurological increments achieved via direct stimulation of relevant cortical centres in the course of self-generated motor activity.

Therapeutic Eurythmy

Therapeutic Eurythmy (TE) is a form of movement therapy that involves cognitive, emotional, and volitional elements and which may also have an impact on psychoneurologic interactions. Historically, TE was developed in 1921 by Rudolf Steiner³³, the founder of anthroposophy and anthroposophic medicine.

Anthroposophic medicine can be characterised as a holistic method, involving the soul and spiritual element of the human being in addition to conventional scientific treatment.²³ This approach expands the traditional division of the human being from soma and psyche to four discernible elements: physical body, life body, astral body (soul) and self (spirit). Health and disease are viewed as the result of a harmonious or disharmonious interaction of these elements in the respective systems of the organism.

The word Eurythmy (Greek) means harmonic, beautiful rhythm in movement. TE is a specific therapeutic transformation of the art movement called Eurythmy. This therapy highlights speech and musical activity in relation to movement. The basic elements of the therapy focuses upon the development and use of vowels and consonants in speech and tones and intervals in music. These are described as “visible singing or speech”.²⁴

Each time we speak or sing, we inwardly perform these movements, and by making them outwardly visible one arrives at a highly dynamic and aesthetically appealing interpretation of poems or a piece of music—Eurythmy as an art.

One can transform these movements by making them conscious and explicit actions promoting their therapeutically effectiveness. The practice relies upon a belief that there are inner laws of resonance by which rhythms of speech and music are linked to life processes. How these movements are executed is highly significant since equal value is afforded to the mechanics of the movements and their inner quality and the attention and emotion with which they are performed.

In a therapeutic situation, the child is taught to imitate patterns of movement shown by the therapist and how to repeat them several times a day until they are executed in a joyful, concentrated and precise way. When used with people with ADHD, the therapy aims to develop an individual’s ability to concentrate and be aware of feelings in a controlled, coordinated and skilful manner. In turn, this promotes psychosocial development.

Method

The subjects

Five children with ADHD—all boys aged between eight and a half to ten—participated in the pilot study. Two were hyperactive. The entry criteria were any form of ADHD, diagnosed by a paediatrician. All five children presented with learning difficulties and disturbed coordination of fine and large-scale motor coordination. All of the children received TE and were not allowed any other therapy during the study. One child was also taking Ritalin. That was the only medicament allowed.

Exclusion criteria were any recognised illnesses, which might have disturbed the therapeutic process. An informed consent of the parents for the study procedure was provided. Due to the purely exploratory nature of the study, no control group was used and each child acted as their own control.

Therapy procedure

The therapy consisted of a series of 30-min sessions in TE once a week in the therapy rooms of a paediatrician’s surgery. The therapist was a licensed Therapeutic Eurythmist.

After patient referral from the doctor, the therapist devised a set of specific therapeutic beginning exercises for each child. They were approved by the parents of each child prior to commencement of the therapy.

Each session consisted of repetition of some exercises from the previous session and the introduction of new additional exercises given in form of movements corresponding to the sounds of some of the letters of the alphabet or to dominant sounds in the poems chosen. Some coordination and skill exercises were also included. The number of sessions per child was between seven and 25, according to when the child started therapy and the available time space. A period of 9 months, including school holidays was available for introducing the therapy.

At least one parent took part in each session and they were requested to make notes about the exercises in order to direct the child in practicing them at home. The children were requested to perform their exercises every day for at least 5 min. Compliance was monitored according to parent's reports and it seems that unless the child was ill, they all practiced the exercises regularly.

Examples of exercises:

1. Coordination and skills
Throwing a ball or a rod to each other to a rhythmically spoken poem.
Moving a copper ball with the fingers of one or two hands.
Carrying out different patterns of jumping over rods.
2. Rhythms
Walking the rhythm, the tact, and the metre of a poem.
Clapping and/or walking different types of rhythms.
3. Sounds of the speech
Making specific patterns of movements with arms, hands, fingers, and legs to spoken letters in a sequence, e.g. BMDNRL.
Jumping or executing specific arm movements for the five vowels.

The process: diagnostic and instruments

In each instance, TE commenced after the paediatrician had made the initial diagnosis and after informed parental consent had been obtained. Diagnosis of ADHD was based on a neurological examination and a diagnostic interview with the

parents of the child, their teachers. In addition an independent psychologist administered a 50-min intelligence test, the Kaufman Assessment Battery for Children (K-ABC).²⁵ The test consists of four scales: two scales measure intellectual skills, one non-verbal skills and one general skills.

At the beginning and end of therapy children completed two standard psychological tests. Firstly, the Lincoln–Oserretzky–Skala (LOS FK-18).²⁶ This is a movement test used to assess the level of general motor development of the child focusing on 18 single tasks including maintenance of balance, tempo of movement, eye–hand coordination and eye–foot coordination. The norms in this test are provided separately for normal children, children with learning difficulties, and mentally handicapped children. The test takes 30 min to complete.

Secondly, the Attention and Burden test (d2)²⁷ was administered. This test measures tempo, carefulness and concentration in work and takes 15 min to complete.

A standard assessment tool—Conner's Rating Scales (CRS-R)—was completed by teachers before and after therapy. This addressed social behaviour problems, learning problems, psychosomatic difficulties, impulsivity, fear, hyperactivity-index.²⁸ It can also be completed in 15 min.

Analysis

The results of the d2-attention test, LOS FK 18-movement test and answers parents and teachers had given to Conner's-questionnaire were separately assessed for each child and compared with the age norms. To judge the effect, the scores achieved in the individual tests at the beginning and at the end of the therapy were compared and related to age norm-values drawn from the literature.

Results

Tests analysis

All data used in the following tables (except d2 test which uses SW or SV—standard values) are based on *T*-scores: converted test values according to the norms for age and gender of the child.

- Conner's parent/teacher questionnaire: *T*-scores are standard scores that are calculated from raw scores in such a way that each scale has the same mean (50) and standard deviation (10). The normality interval is between 50 and 70 *T*-points.²⁸ The maximum of the scale heights is 100 *T*-points

- LOS FK18: In order to enable objective assessment of the child's motor development. The raw tests results have to be compared with the average results of the age group. The raw data must be converted to standard values (T -values). They are used as norm-values, with a deviation of 10 T -values. The mean is 50 and the normality interval is between 40 and 60.²⁶ Maximum of the scale is 80.
- d2: The d2 test is presented in standard values ($SW = 100 + 10(x - x')/s$) where x is a raw value, x' medium and s standard deviation. The mean is 100 and the normality interval is between 95 and 105.²⁷ The maximum of the scale is 130.

LOS FK 18-motor test

The results of the test LOS FK 18 (Fig. 1) show a visible overall change for the better in all five children. All five had a similar level of development characteristics for children with learning difficulties at the beginning of the therapy. They were below normal levels of movement development (band of confidence for $T = 40 - 60$). They were unable to maintain balance, jump, coordinate right and left sides of the body when moving, or to execute fine finger movements. These functions improved following therapy.

All reached the normal range, and three children managed even to rise above the normal level of development of movement for children with learning problems. Because different areas of movement performance are not specified in the 18 tasks and there is no classification of items, it is only possible to show a general tendency of change.

d2-concentration test

The results of the d2 attention test show an increase of concentration (Fig. 2) in four out of five children. Especially interesting is the change in child 4, who was diagnosed as hyperactive and who

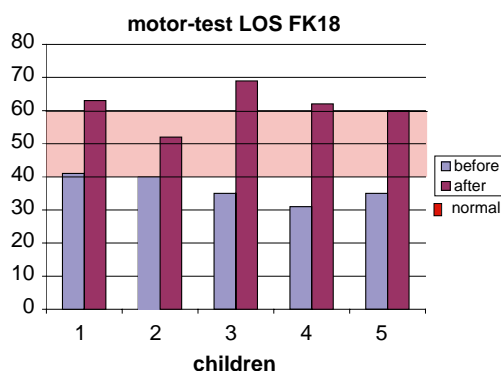


Figure 1 Motor-test LOSFK 18.

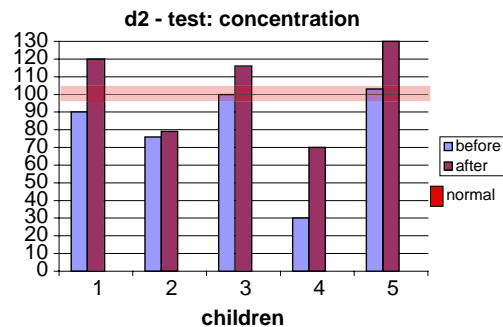


Figure 2 d2-test: concentration.

initially had the lowest level of concentration at the beginning of therapy. Over the course of therapy this child achieved proportionally the largest increase of concentration.

Child 2 showed a negligible improvement of concentration. This may in part be due to his severely impaired sight that prevented him from seeing the letters of the test clearly.

A marked improvement was noted with child 5, who stopped taking Ritalin approximately a month before the end of therapy.

d2-tempo of movement

The results in the tempo of working scale of the d2 attention test (Fig. 3) show that whilst change was not very pronounced some change occurred in each child and particularly with child 1, who received therapy for only a short period, but also in the cases of hyperactive child 4 and 5, who stopped taking Ritalin.

Conner's questionnaire

According to answers given by parents to Conner's questionnaire, a positive change in social behaviour (Fig. 4) for four out of the five children after therapy. The biggest change could be noticed in case of both hyperactive children: 3 and 4.

A positive change in social behaviour (Fig. 5) was also indicated by answers given by the teachers to Conner's questionnaire. No difference was noted for child 2; no data was available in the case of child 4.

Analysis of the Connor questionnaire also identified a drop in hyperactivity in case of four children (Fig. 6) with the biggest reduction occurring with child 5 who was initially taking Ritalin at the beginning of study and then stopped medication. Teachers also noted a marked reduction in hyperactivity. It is interesting to notice that the teacher of child 1 saw positive changes where the parents did not see any. No data was available for child 4.

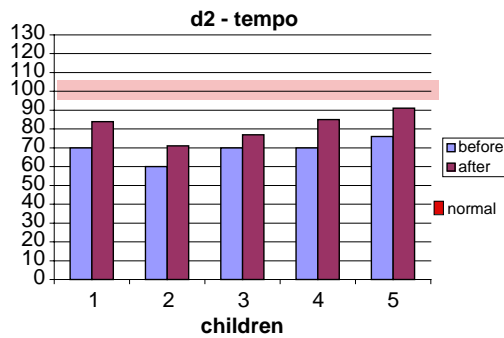


Figure 3 d2-test: tempo.

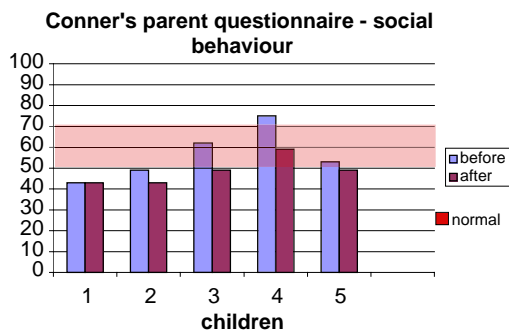


Figure 4 Conner's parent questionnaire—social behaviour.

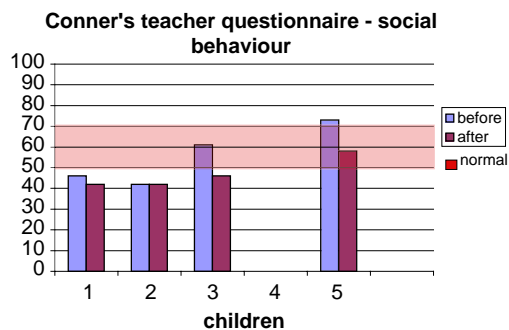


Figure 5 Conner's teacher questionnaire—social behaviour.

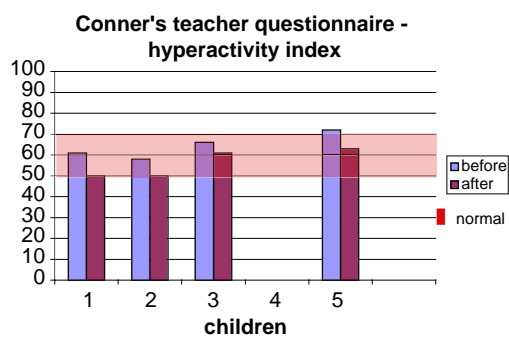


Figure 6 Conner's teacher questionnaire—hyperactivity index.

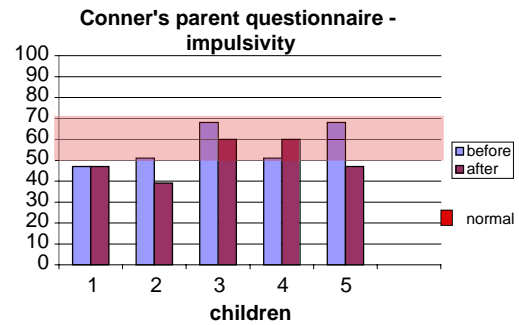


Figure 7 Conner's parent questionnaire—impulsivity.

The answers the parents gave to Conner's questionnaire concerning impulsivity (Fig. 7) were more differentiated. Although a positive change predominates, child 4 (hyperactive) showed an increase of impulsiveness.

Individual observations

The five boys, who received TE presented with problems associated with coordination, dexterity, deftness and balance. However with the exception of one boy who was taking Ritalin and was initially difficult to motivate, all were willing to practice their exercises. Parents' reports suggest that after 7min sessions all the children were easier to motivate to do their homework, there was an improvement in social behaviour and skills, and that the children became able (sometimes unexpectedly) to take their own initiative in organising their homework or leisure activities. According to the mothers' impressions, their children were more mature at the end of the therapy and had developed greater self-esteem.

Discussion

The results of this pilot study would suggest that individual children with ADHD benefit from TE.

Social behaviour problems were reduced and hyperactivity was reduced. In particular children developed their motor skills significantly. Whilst the Conner's Questionnaire indicated that learning difficulties remained the same, some parents perceived positive changes. Generally, parents as well the doctor considered the children to be more mature in their development after the therapy. It is significant to note that the only child who was taking Ritalin at the beginning of therapy stopped medication because the parents observed an improvement.

The results of this study strengthen the argument that movement and in particular the organised movement therapy of Therapeutic Eurythmy can positively influence mental processes relevant in ADHD.¹² This therapy can be described as a form of intervention which promotes the enhancement of some mental processes such as concentration and skilled movements. This occurs by activating self-regulation processes (the will) via self-initiated and self-controlled complex movement sequences³³.

However, it is important to note that only limited conclusions can be drawn from this very small study. It is presented as an exploratory pre- and post-study of a small group of five children receiving Therapeutic Eurythmy. No claims are made to generalise from this account. The number of treatment sessions should also be standardised in future studies. However there were observed improvements in coordination and behaviour that were assessed with differentiated standard instruments routinely used in the diagnosis and treatment of ADHD.²⁹

Larger and more systematic studies are warranted in order to substantiate the findings of this study.

One interesting questions, which could not be answered in this account is whether the effects of TE would be sustainable over longer periods of time, or whether improvements are short lived as in the case of medication such as Ritalin.⁷ If there is a long-term effect it would be interesting to explore whether behavioural changes are in some way linked to change in neuronal functions or structures as a result of stimulated, controlled, focussed movements of the limbs.¹⁷ This would open up an interesting debate concerning the effectiveness of a therapeutic or behavioural rather than symptomatically oriented ADHD treatment. In regard to this paper, it is suggested that Therapeutic Eurythmy benefits children suffering from ADHD.

TE attempts to consider patients as unique individuals; thus specific therapeutic care is developed for each individual. This also presents a methodological problem when trying to research such an approach. It is hoped that the use of pre and post measuring goes some way towards monitoring changes associated with individuals receiving the therapy. However, clearly there are a number of additional variables that would need to be standardised in future studies of this therapy and the condition of ADHD.^{23,30} In the study, individual TE exercise programmes were developed according to the doctor's diagnosis and the individual's special needs. In future studies longitudinal follow-up would be beneficial and designed such as

to allow for individual monitoring content of treatment and duration of treatment phases.

In Switzerland, a 1-year training in TE follows the basic 4-year training in artistic Eurythmy. This forms the basis upon which a therapist can establish independent practice and liaise with the patient's GP.³¹ There are many Eurythmy schools and TE training centres all over the world, e.g. in Germany, Netherlands, Great Britain, and the United States of America. In Switzerland more than one hundred practitioners work together with GPs (most of them representing the anthroposophical medicine). The treatment is as a rule paid for by the medical insurance of the patient, providing that he or she pays an additional premium to cover the expenses of extended medical benefits.

The potential benefits of enhancing mental processes such as attention, movement skills and social behaviour through TE as suggested in this pilot study should be explored further.

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