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A clinical study of homoeopathic medicine in the treatment of specific learning disorders in school children within the age group of seven to eleven years

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Abstract
Specific Learning Disorder is a neuro developmental disorder with biological origin, that is the basis for abnormalities at a cognitive level that are associated with the behavioural signs of the disorder. The essential treatment of Specific Learning Disorder is remedial education, which should begin early when the child is in primary school.
At present, there is no universally standardized screening procedure to guide referrals from schools. In India the teacher certification programmes are deficient in special education. Each child with a learning disability will have his or her own profile of learning abilities but in our social settings such students are not getting much attention.
In Homoeopathy very few studies were done on this subject therefore a prospective study was undertaken with an objective to ascertain the effectiveness of Homoeopathic medicine in the treatment of Specific Learning Disorders.
The Design of study is quazi experimental design done on all diagnosed cases of seven to eleven years of age group children of both sex in OPD of Govt. Homoeopathic Medical College Trivandrum and Govt. schools of Trivandrum educational sub-district.
Homoeopathic medicines are selected on the basis of Homoeopathic principles. The improvements were assessed by comparing before and after score of DST-JINDIA.
To know whether the study is significant statistically, paired t test was used to compare the score before and after treatment.
The results from the study suggest that homoeopathic medicines selected on the basis of Homoeopathic fundamental principles were effective in the treatment of Specific Learning Disorders, also considerable changes were observed in the behaviour of the children. Statistical significance of p value<0.01confirm the effectiveness of the treatment.

Keywords: Specific learning disorders, dyslexia screening test, diagnostic and statistical manual of mental disorders, homoeopathy

Introduction
Specific Learning Disorder can interfere in the ability of a child to acquire and apply reading, writing, and math skills.
Diagnostic And Statistical Manual of Mental Disorders (DSM) published by the American Psychiatric Association uses the term "Specific Learning Disorder. "According to the current version DSM 5, Specific Learning Disorder is a neuro developmental disorder with a biological origin, that is the basis for abnormalities at a cognitive level that are associated with the behavioural signs of the disorder. The important feature of Specific Learning Disorder is difficulties in learning academic skills with onset during the years of formal schooling. Key academic skills include reading skills, reading comprehension, written expression and spelling, and mathematical reasoning [1].
A significant achievement in the historical backdrop of Learning Disability was the Washington Summit on Learning Disabilities in 1994. At the summit, the prevalence of Learning Disability was cited as 15% of the population. Among the learning disabilities, deficits in basic reading skills were the most prevalent [2].
The multilingual social setting in India, where children regularly learn to study through a medium other than their mother tongue is a complexity that makes diagnosis extremely difficult and, estimation of prevalence becomes impossible.

The prevalence study on Learning Disability conducted by the L.T.M.G. Hospital, Sion, Mumbai uncovers that of the total number of 2,225 children visiting hospital for accreditation of any kind of disability, 640 were diagnosed as having a Specific Learning Disability and these children belong to lower, middle socioeconomic strata of society. Referral was due to their poor school performance [2].

In 1997 Sree Chithira Thirunal Institute of Medical Sciences and Technology conducted a study and displayed about 10% of the childhood population exhibit developmental language disorders of one type and another 8-10% of the school population show learning disability of one form or the other [2].

For 50 years, research has been done on the cause of learning disabilities various possible causes have been postulate over years with varying degrees of support. Genetic factors and brain insult in the antenatal, natal and postnatal periods are possible etiologies [2].

Children with Specific Learning Disorder might expect them to exhibit structural or functional differences in neurobiological learning circuits. The dysfunctions of cortico-striatal systems can explain difficulties in learning language. These have a greater impact on aspects of language that involve learning complex rules that are probabilistic and sequential, such as phono tactics and morpho-syntax, but would also affect the ease with which learned motor skills become habitual [3].

At a cognitive level core deficits in phonology, especially on tasks that express the ability to understand the sound structure of words (phonological awareness) and those that involve no word repetition (motor control and phonological memory) and also deficits in syntax, morphology, and the lexicon [4].

It is impossible to mention one mechanism that predisposes learning disabilities. Many factors are implicated in the predisposition to learning disorders, including low birth weight, premature birth, maternal alcoholism and smoking, cerebral palsy, inadequate development of brain lateralization, early and protracted poor nutrition, and even thyroid disorders [5].

The Specific Learning Disorders are categorized according to the specific skill area where individual having problem

- Reading disability (dyslexia)
- Problems in arithmetic and mathematics (dyscalculia)
- Problems with written expression and handwriting (dysgraphia)
- Spelling difficulties (dysorthographia)
- Problems regarding recalling names, symbols and vocabulary (dysnomia)

These different categories of Specific Learning Disorders are not mutually exclusive and any individual may experience issues in more than one of the above regions [6].

People with learning disabilities are of average or above average intelligence, seem to be a very bright and intelligent person, yet may be unable to demonstrate the skill level expected from someone of a similar age. This is why learning disabilities are referred to as “hidden disabilities” [7].

It is essential to identify learning disabilities and related problems as early as possible. Neural circuitry is continually constructed and reconstructed in response to experience. Genetic predispositions will also influence on the architecture of the dyslexic brain, therefore, it is crucial that individuals at risk for dyslexia receive effective treatment [6].

Specific Learning Disorders is a cost-intensive disability, and remedial education is the most costly component. To reduces the huge economic burden of Specific Learning Disorders, the primary school students should be screened early and afflicted students should be offered appropriate, affordable remedial education within schools [8].

Early intervention presupposes early identification. In the current situation, unavailability of universally standardized screening procedure to guide referrals from schools is major factor to identify such children.

The key academic skills such as reading, writing and mathematics form the foundation upon student’s performance at school are assessed. A learning problem may give rise to the feeling of anxiety sometimes inadequacy and shame which may leading to behavioral disturbances in children of school age. Any negative feedback from school is likely to have an impact on the emotional, social and family functioning of a child [2].

Interventions should aim to developing basic skills of reading, writing and arithmetic. In addition ensuring that children are allowed to “think” for themselves, to develop higher cognitive functioning is vital [2].

A definite diagnosis of Specific Learning Disorders cannot be made until the child is about 7-8 years old, some children are “normal late developers” and they outgrow their learning problems. However, academic difficulties of children in the age group of 5-7 years should also be assessed, and if they reflects signs of Specific Learning Disorders should be considered as at risk of developing LD, and with no time remedial education must started [9].

Psychometric testing will confirm the diagnosis and help in planning the intervention. The psychometric testing is mainly testing for cognitive and academic abilities. After assessment of IQ, tests which help to analyses academic abilities need to be administered.

Dyslexia Screening Test (DST)- DST-JINDIA” intended for the younger age group of 6:6 – 11:5 years. It is intended for use by school professionals, special educators, health professional psychologists. The Indian edition of DST-J provides norms standardized to the Indian population of interest [10].

A study conducted under the Extra-Mural Research Scheme of Department of AYUSH, Ministry of Health to verify Use of homoeopathic remedies in the management of learning disabilities showed statistically significant change in the indicators of dyslexia and dysgraphia.

Each child with a learning disability will have his or her own profile of learning abilities and learning disabilities. There is no stereotyped individual, each must be assessed and understood individually so when implement an interventional strategy should consider the uniqueness of each child.

The reason for the success of homoeopathic medicine lies in the fact that they offer something which today's physician is unable to provide. The reason is the greater degree of individualization of the treatment, attention being paid to the human and psychological elements, which are becoming increasingly neglected in this era of ultra-high-tech medicine [12].

Individualization teaches us to treat the individual with the

disease and not his diseased parts alone. Homoeopathy recognizes the individuality of each patient through entire examination by considering the characteristic symptom which differentiate the case from others [13].

Materials and Methods

The study was done on all diagnosed cases of seven to eleven years of age group children of both sex registered in OPD of Govt. Homoeopathic Medical College Trivandrum and Govt. schools of Trivandrum educational sub-district from October 2018 to march 2020.

Cases satisfying the inclusion, exclusion and diagnostic criteria were selected for the study. The cases were diagnosed by a Clinical psychologist. The study protocol was approved by the ethical committee. Written informed consent was received from the parents stating the willingness to participate in the study

- **Study design:** Quazi experimental design
- **Sampling:** purposive sampling
- **Sample size:** 30 cases
- **Inclusion criteria**
  - Age between 7-11 years of both sex
  - IQ average and above
  - Dyslexia screening test, s DST-JINDIA score above 0.6
- **Exclusion criteria**
  - Those who are taking supportive interventions like remedial education with the help of a special educator, occupational therapist.
- **Diagnostic criteria**
  - The cases were diagnosed by a Clinical psychologist and scoring done by using Dyslexia Screening Test DST-JINDIA [10].
- **Technique:** Individualized homoeopathic medicines

Methods

The study was conducted to elucidate the effect of Homoeopathic medicine in the treatment of Specific Learning Disorders in school children within seven to eleven years of age. Cases were diagnosed by clinical psychologist through IQ, Learning disability assessment scale, case taking was done using case taking proforma, after administration of homoeopathic medicine, cases were reviewed at an interval of 2 weeks. Selection of homoeopathic medicine, potency, dose and repetition of medicine for each case was based on homoeopathic principles. At a time, single medicine was administered in minimum dose and suitable potency according to the nature of the case. As long as the patient was improved on the given dose, no interference was made further.

When the progressive improvement was found to be ceased, another dose of same medicine was repeated. When it seemed that the previous potency was not enough to bring a sufficient improvement, next higher potency of the same medicine was administered.

Whenever the totality of symptoms seemed to be changed, a fresh examination was made and anew medicine was selected. Along with homoeopathic medicine small exercises advised to improve concentration, and helped to study phonetics and some tips were given to boost self-confidence.

Outcome measurement

The learning disability assessment tool DST-JINDIA Consist of 11 sub-tests. It developed for each age and each test, so that child's performance on each test can be easily allocated a standardized score with three risk indicators.at risk quotient above 0.6 indicates mild risk for disability and above 0.9 indicates high risk for disability.

Plan of analysis

The final analysis of the study was done by means of appropriate statistical methods and the confirmation was done using the test of significance. Since there were pre and post treatment scores, the test of significance used was Paired t test.

Results

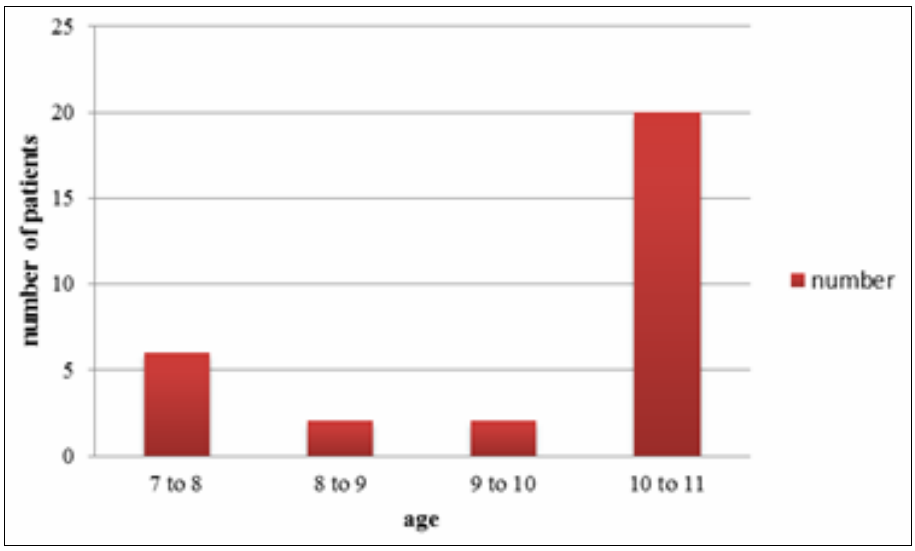

Fig 1: Distribution of cases according to age

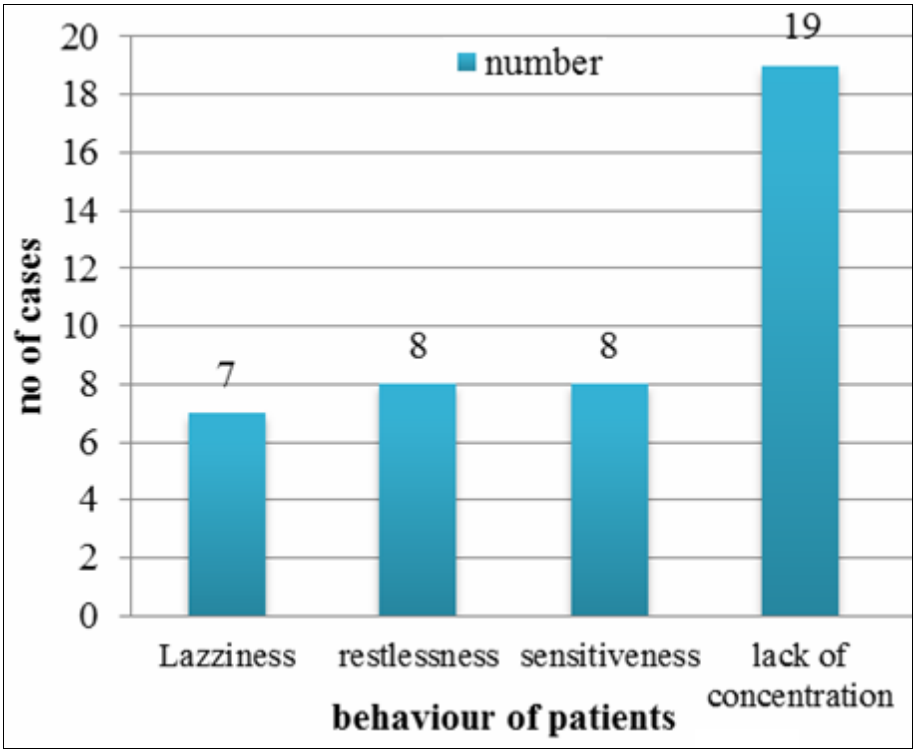

Fig 2: Distribution of cases according to exhibited behavior of patients

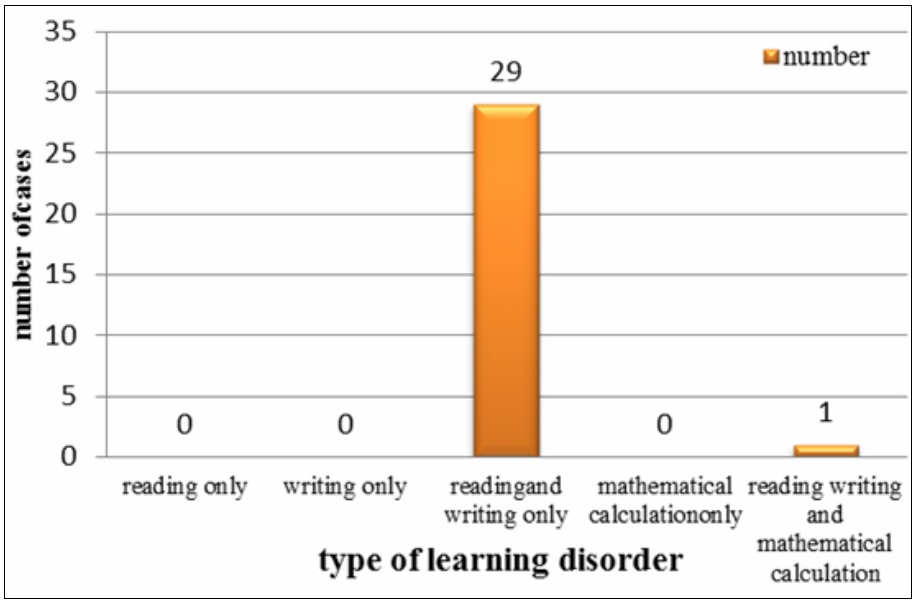

Fig 3: Distribution of cases according to type of specific learning disorder

Statistical analysis of dyslexia screening test score

To analyses the pre and post treatment changes in the total symptom score Paired t test is used.

Let x be the total score before treatment and y be the total score after treatment. Null Hypothesis H0: There is no difference before and after treatment

Alternate Hypothesis H1: There is significant difference before and after treatment.

$$\sum d = 6.639 \quad \sum d^2 = 3.552 \quad n = 30 \quad |d| = \frac{\sum d}{n} = 0.221$$

$$SD = \sqrt{\frac{\sum d^2 - [(\sum d)^2/n]}{(n-1)}} = = 0.26$$

$$\text{Paired } t = \frac{|d|}{SD \text{ of } d/\sqrt{n}} = \frac{0.221}{0.268/\sqrt{30}} = 4.516$$

From the table the paired t value at n-1 degree of freedom i.e. t 29 at 5% (0.05) level of significance is 2.045 and at 1% (0.01) level of significance is 2.756.then null hypothesis rejected.

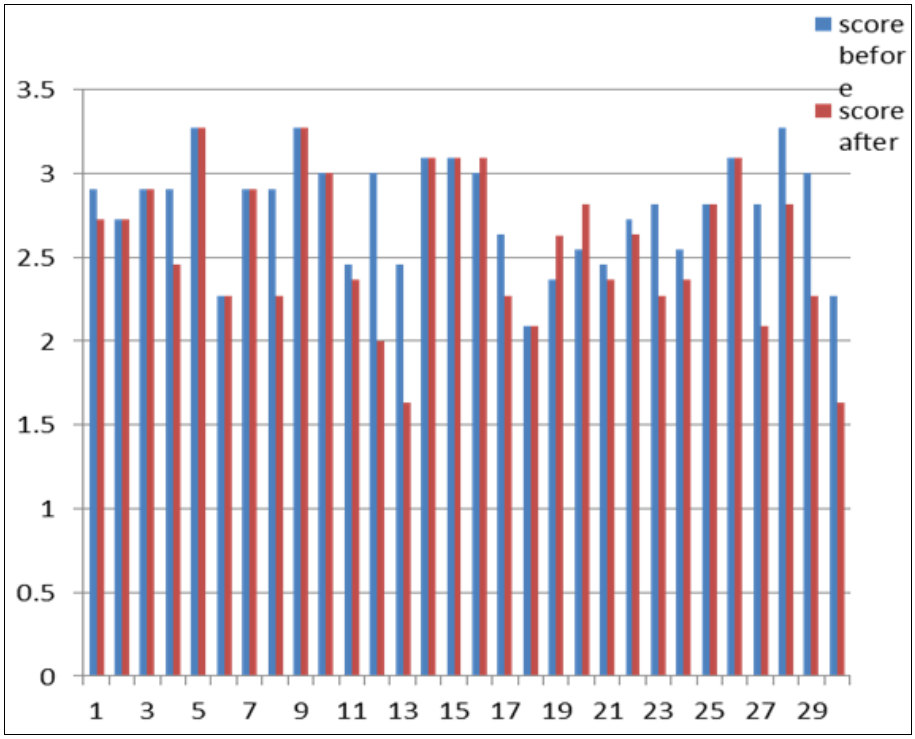

Fig 4: Comparison of total DST score before and after treatment

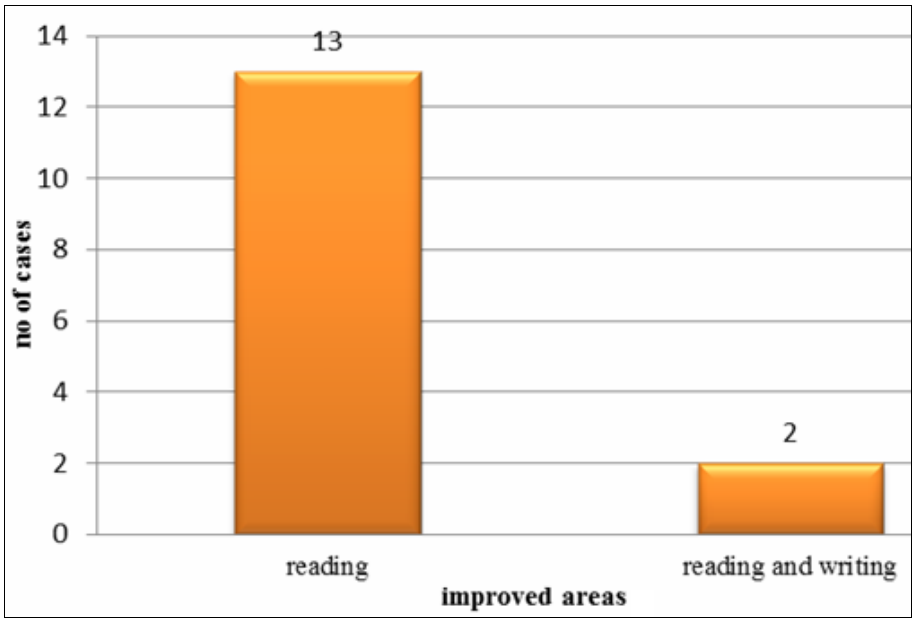

Fig 5: Distribution of cases according to the improvement in type of learning

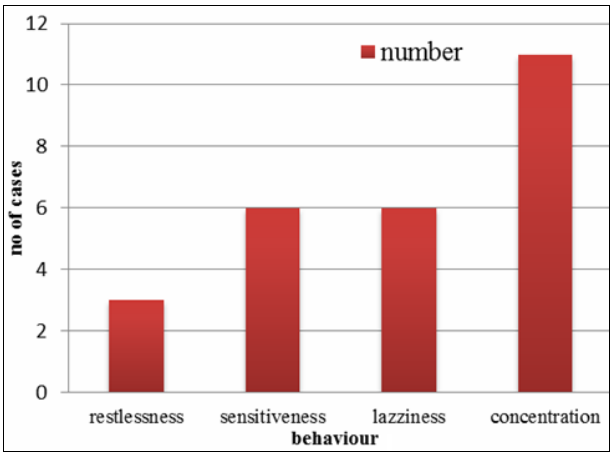

Fig 6: Improvements obtained in the behavior of patients

Table 1: Distribution of cases according to the selected medicines

Indicated medicines	No of cases
Calcarea carb	2
Carcinosin	7
Lycopodium	7
Medorrhinum	2
Natrum Mur	3
Silicea	3
Tuberculinum	9

Discussion

Out of 30 cases 97% of cases have been suffering from both writing and reading disabilities. None of the cases out of 30 presented with single type of learning disorder. It is evident from previous studies and DSM -5 that most of the children were presenting with combined disorders.

Most of the children presented with some behavior pattern other than presenting complaint. After treatment other than improvement in the scoring, some sort of improvement obtained in behavioral pattern especially in restlessness, laziness, sensitiveness, concentration. A change in their learning capacity could be seen according to improvement in concentration.

Initially changes appeared in the field of reading, then gradually to writing. Previous studies in homoeopathy about specific learning disorders noted some improvement in sub areas of learning at 3 months except for reading comprehension which initiated on 9 months onward.

In the present study improvement was obtained in reading and pronunciation and improvement started 3-4 months onwards in some cases and some cases after 5-6 months. In some cases there was no improvement observed within study period.

After the first prescription of medicine and its repetition, when totality of symptoms changed, a second more apt medicine had given in most of the cases. Mostly follow up medicine was nosode and all indicated medicines given in higher potency like1M, 10M, 50Millisemal. When 2 or 3 cases were started with lower potency, improvement was sluggish, so further cases were started with higher potency and medicine repeated based on the improvement. Monthly repetition and raising the potency helped to get improvement in most of the cases.

Limitation of the study

One of the difficult part of this study was availability of cases. Teachers could not differentiate students with disabilities, so it was a laborious task to find such students with the help of a clinical psychologist.

Next task was convincing the parents of such students. Many no of cases were dropped due to inconvenience from the parents (either due to emotional factors or due to lack of knowledge about such disabilities). Within this limited time period a complete result was difficult to obtain. This was also a limitation.

One of the inclusion criteria was age group of 7-11years, Most of the parents and teachers identified the complaint when the child reaches 6 and 7th standard so couldn't include that age group for the study.

One of the comorbidity of Specific Learning Disorder is ADHD, both may overlap each other, it could hinder the diagnosis so had to drop some cases even though they had learning disabilities.

Conclusion

The results from this study suggest that homoeopathic medicines selected on Homoeopathic fundamental principles are effective in the treatment of Specific Learning Disorders. The study would have been more significant if the duration of study was longer.

It is necessary to make an awareness of such disabilities in the society, especially for parents, its early identification is more helpful for an apt intervention and speedy improvement, this will make a positive changes in the attitude towards such children.

Acknowledgments

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