Effect of Vestibular Stimulation on Language Skills of Children with Attention Deficit and Hyperactivity Disorder

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Abstract

Aim: The purpose of the study was to evaluate the effect of vestibular stimulation on language in children with Attention Deficit and Hyperactivity Disorder.

Methodology: Total of 30 subjects with Attention deficit and hyperactivity disorder, 15 in experimental group and 15 in control group with age of 4 to 6 years participated in this study. Both control and experimental groups were assessed using The Bzoch-League Receptive-Expressive Emergent Language Scale (Reels) for the measurement of language skills in children.

Result : Statistical significant is present (t = 3.8) in the experimental group with regard to effectiveness of vestibular stimulation on language skills among ADHD children.

Concusion: The conclusion of this study indicates that the vestibular stimulation activities are effective in improving language skills in ADHD children.

Keyword: *ADHD, Vestibular Stimulation activities, Language skills, Occupational Therapy.*

Introduction

Attention deficit hyper activity disorder (ADHD)[1] is a developmental disorder characterized by persistent hyperactivity, inattention and impulsivity that significant impairs educational achievement as functioning. According to the Diagnostic and statistical manual of mental disorders criteria published by the American Psychological Association (ADA) symptoms must be displayed before the child reached 7 years as behavior that are indicator of the disorder must be seen at least through two different fields and destruct considerably social, occupational or educational performance of the patient. The symptom varies among patients and include behavior problems such as inattention, hyperactivity, impulsivity.

Research has reported ADHD prevalence estimate of approximately 5.9%-7.1% in children and adolescence with a male and female ratio of approximately 3:1 in population sample[2].

Many children with ADHD may have various kind of communication difficulties[3] even if they do not have a diagnosed language disorder symptoms of inattention and hyperactivity frequently co-occur with language difficulties[4]. Impairments in executive function give rise to both behavioral and social communication problem and additional or alternative deficits in other cognitive abilities[5].

Early identification and treatment prevents or minimize many of the negative effects of the disorder. The evaluation and management of a child with ADHD involves a multi-disciplinary effort. The vestibular stimulation can be of value in improving balance in children with hemiplegic cerebral palsy[6].

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Vestibular stimulation separately or in combination with other forms of sensory stimulation applied to infant as children's has been reported to effect several behavior issues. The vestibular stimulation that work best to improve language in the type of ADHD. The vestibular activities such as climbing, trampoline, ladder climbing, balance board activities can be given.

Barbara Bruce[7] Conducted study to evaluate ADHD and language impairment. The parental questioner FTF was given to parents of 76 children (mean age 11 Years) diagnosed with ADHD about half and the children heal at least once been referred to a speech and language pathologist measurement by the FTF questioner most of them have not received any interventions or follow up. A factor analysis identified problem areas. Which explain close to 75% of the total variation. Communication and language comprehension caused these children many more problems of reading and writing are very frequent. IQ score was associated with maths and reading writing. Additional item reflecting language skill, in particular language comprehension and pragmatic were also found in other domains in FTF problem with language this seem to be associated with the typical problems.

Nancy J. Cohen[8] evaluated the interface between ADHD and language impairment, an examination of language achievement and cognitive processing data for this study were collected as part of a larger research project examining 20 subjects with, the kaufman test of educational achievement (KTEA) was administered to obtain standardized scores on subscales that measured reading decoding. It was concluded that caution must be exercised in attributing to children with ADHD what might be reflection of problem for children with language impairment generally.

Charul A. Dave[9] suggested vestibular stimulation would produce both short and long term decreases in stereotypic behavior in the subjects. Intervention given for 3 consecutive days during each week of the treatment phase. Immediately after intervention, post treatment data on body rocking was recorded for 5 min with procedures similar to those used in base lines. Results shows that significant reduction on body rocking behavior in mentally retarded.

Julie Brocklhurst[10] evaluated the use of tactile and vestibular stimulation to reduce stereotypic behavior in 2 adults with mental retardation and concluded that tactile vestibular stimulation are adequate for the reduction of stereotypic behavior. In this study the researcher intend to find out the effectiveness of vestibular stimulation on language skills of children with ADHD.

Aim

The Aim of the study is to find out the effect of vestibular stimulation on language skills among children with ADHD.

Objectives

Ø To assess the language skills of children with Attention Deficit and Hyperactivity Disorder.

Ø To Evaluate the effect of Vestibular stimulation on language skills of children with Attention Deficit and hyperactivity Disorder.

Materials and Methods

The purpose of the study is to determine effectiveness of vestibular stimulation on language skills among ADHD children.

Research Design: The present study was two *groups, pre test and post test quasi-experimental design.*

Study Setting :*Occupational Therapy Foundation, Thiruchengode.*

Population and Sampling : *A Total of 30 Subjects were selected based on Convenient sampling method and divided into Control and experimental group with 15 subjects in each.*

Selection Criteria

Inclusion criteria:-

1. Children diagnosed as ADHD by paediatrician or clinical psychologist

2. ADHD children with the age range of 4-6 years.

3. Both genders were included.

Exclusion criteria:-

1. Children with seizure episodes.

2. Children below 4 years and above 6 years.

3. ADHD children with any other associated medical conditions.

Variables

Independent Variable: *Vestibular stimulation*

Dependent Variable: *Language skills of ADHD Children.*

Measurement Of Tool And Meterials Used

The Bzoch-League Receptive- Expressive Emergent Language Scale (REELS).

Test Material

- Ø *Trampoline*
- Ø *Swing*
- Ø *Balance board*
- Ø *Ladder climbing*
- Ø *Jumping rope*
- Ø *Therapy Ball*

Procedure

Totally 30 subjects who met the selection criteria have been included in this study, they are equally divided into control and experimental group by convenient sampling method. Both control and experimental group was assessed using receptive-expressive emergent language scale (REELS). Pre test data was obtained. The control group received Occupational Therapy treatment, where as the experimental group received both the occupational therapy and vestibular stimulation Activities such as swinging in Bolster, T swing, Disc swing and Platform swings. Activities such as jumping on trampoline, Overhead activities while standing on balance board, ladder climbing, rocking horse, somer saults, obstacle course and sliding were given in a therapy session for 6 weeks and in an alternative days for 1 hour sessions. After the intervention period the post test data was obtained with the same tool . sores are tabulated and statistically treated with "t" test.

Results

Table 1 : Comparison of pre test scores between control group and experimental group

Group	Test	Mean	S D	"t" value	"p" value
Control group	pre-test	4.000	0.802	1.2444	0.2237
Experimental group	Pre-test	4.367	0.812		

TABLE 2 : Comparison between pre test and post test value of control group

Group	Test	Mean	S D	"t" value	"p"value
Control group	Pre-test	4.000	0.802	0.1280	0.8999
Control group	Post-test	3.967	0.834		

TABLE 3 : Comparison between pre and post test values of experimental group.

Group	Test	Mean	S D	"t" value	"p" value
Experimental group	Pre-test	4.367	0.812	3.8258	0.0019
Experimental group	Post-test	5.133	0.550		

TABLE 4 : Comparison of post test scores between control group and experimental group

Group	Test	Mean	S D value	"t" value	"p" value
Control group	Post test	3.967	0.834	4.5239	0.0001
Experimental group	Post test	5.133	0.550		

Discussion

The purpose of the study is to determine the effectiveness of vestibular stimulation on language skills among children with ADHD. The subjects were selected using convenient sampling method. In this study 30 subjects were involved, out of which 15 subjects were under experimental group and 15 subjects under control group. REELS test has been used to assess the language skills of ADHD Children. The duration of the intervention was 6 month, session were given one hour per day in alternative days, total of 18 sessions of vestibular stimulation activities were administers for experimental group along with regular occupational therapy whereas control group received only regular Occupational therapy. Pre and post test scores of REELS were statistically analyzed with "t" test.

Table 1 The unpaired 't' test was done between control group and experimental groups, the mean values are 4.00 and 4.36vrespectively, "t" values is 1.244 . This indicates the experimental group and control group were homogenous and can be compared for the study. In table 2 the paired 't' test was done in control group, the result signifies that the control group has no significant difference in the pre-test and post-test scores, the mean is 4.000 and 3.963 respectively, 't' value is 0.1280 and 'p' value is 0.8999. It indicates that there is no difference in the language skills of ADHD children in the control group.

Table 3 the paired 't' test was done in experimental group, mean values are 4.367 and 5.133, "t" value is 3.825, its shows the significant difference between pre and post test of experimental group. This findings suggests that the vestibular stimulation improved language skill in children with ADHD. These findings are also supported by W.Michel Magrun[11]. In their study effect of the vestibular stimulation on improving language skill in developmentally delayed children. In a group of 5 primary trainable mentally deficient and 5 developmentally retarded pre schools was studied. Subjects received vestibular stimulation prior to a free play situation and were monitored for spontaneous recognizable language use. Result indicated an increase in spontaneous verbal language used for both groups.

Table 4 the unpaired 't' test was done between control group and experimental group the mean values are 3.964 and 5.133 respectively and "t" value is 4.5, it shows there is significant difference is present. While comparing the pre test scores between the groups there was no significant difference, whereas in post test comparison there is significant difference between

groups. These finding are also supported by Robert M. Kanter[12].

Conclusion

The conclusion of this study indicates that the vestibular stimulation activities are effective in improving the language among ADHD children.

Ethical Clearance : Taken from Institutional ethical Committee of JKK Munirajah Medical research Foundation, Namakkal, Tamilnadu.

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Conflict of Interest : Nil

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