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Original Research Article

Effect of multimodal therapy on children with attention deficit hyperactivity disorder

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ABSTRACT

Background: Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder affecting school aged children. Multimodal treatment is the most effective form of treatment which includes multiple elements like parent and child education about diagnosis and treatment, specific behaviour management techniques, medications and appropriate educational programs. This study was planned to study effect of multimodal intervention i.e. medication along with behavioral modification therapy and occupational therapy given to children with ADHD.
Methods: This was a longitudinal, prospective study carried out from January 2014 to October 2014, in which children coming to pediatric neuro-developmental centre and diagnosed as ADHD were included. Cognitive behavior therapy (CBT) was given along with required medications to these children. Improvement in symptoms was checked by Conner scale 3TM long form given to both parents and teachers.
Results: 41 out of 50 children complied with our study and majority were of ADHD- combined type (92.6%). 31 out of 41 students achieved non-significant, T- score at the end of 6 months on Global score of Conner Scale.
Conclusions: Multimodal intervention was found effective in treating children with ADHD.

Keywords: ADHD, Attention, Behaviour therapy, Children, Cognitive behaviour therapy, Multimodal therapy

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder affecting school aged children and is characterized by inattention, poor impulse control and decreased self-inhibitory capacity and motor over activity and restlessness. Children with ADHD have been identified as being at greater risk of experiencing poor academic performance, problems with social integration, and emotional difficulties.[1]

Multimodal treatment is the most effective form of treatment for children and adolescents with ADHD. This approach includes multiple elements like parent and child education about diagnosis and treatment, specific behavior management techniques, medications and appropriate educational programs which work best together and support each other. These various interventions or "modes" of treatment reinforce each other and produce the best outcomes for children and adolescents with ADHD.

Children vary a great deal in their response to medication treatments.[2]

Behavior modification is an approach to therapy that is based on conditioning and its goal is to change behavior. Behavior modification usually seeks to extinguish or stop an unwanted behavior and replace that behavior with a desired behavior. Various behavior techniques include positive reinforcement, negative reinforcement, punishment, extinction, time out, etc.[3] Rejani et al in their study found that multimodal intervention was superior to routine medical management in reducing ADHD symptoms, behavioral problems at home and school, and in improving academic performance.[4]

At present, there is scarcity of data in Indian literature regarding effects of multimodal intervention. Hence this study was planned to study effect of multimodal intervention i.e. medication along with behavioral modification therapy and occupational therapy given to children with ADHD.

METHODS

It was a longitudinal, prospective study carried out in the Pediatric neuro-developmental centre of Lokmanya Tilak Municipal Medical College and General Hospital, Mumbai, India from Januray 2014 to October 2014. The study was passed by the Institutional Ethics Committee. All children of age group 6-12 years coming to the centre diagnosed as having ADHD as per DSM- 5 criteria (diagnosis was done by detailed interviewing) and parents giving consent were included in the study.[5] Children with intellectual disability (mental retardation), autism spectrum disorder, any mood disorder or psychotic disorder or any co morbid medical illnesses were excluded from the study.

All children coming to the centre from January 2014 to October 2014 were screened for ADHD and those testing positives were enrolled after written informed consent from the parents. Conner scale 3TM long form was given to both parents and teachers. It is rating Scale used mainly for assessment of ADHD and other Co morbid conditions.[6] Informant is asked to provide the rating for each question related to child's behavior. Scoring is done from 0 to 3 (not true at all - very much true). Various sub-scale scores can be obtained like inattention, hyperactivity/impulsivity, learning problems, executive functioning, defiance/aggression, peer relations, family relations and global index. Children were started on medications for ADHD as per the requirement.[7] In cognitive behavioral therapy (CBT), the main general concerns were inattention, disorganization, incomplete homework, losing things often, impulsivity, anger outbursts, learning problems, poor eye contact, poor sleep patterns and poor eating habits.

The commonly used strategies involved the use of rewards and behavioral monitoring charts, routine planner, timeout technique, use of token economy systems etc. along with parental counseling. The techniques used varied according to the needs and concerns of the child. Timely follow up sessions was held in order to monitor the child's progress. These entire CBT sessions were carried out by trained therapist. They were called for follow up initially twice a month, and later monthly. Assessment of improvement was done after 3 and 6 month on basis of Conner global index scales.[8]

Data were entered in Microsoft Excel and analyzed using computerized software. Appropriate statistical tests were applied and p value of less than 0.05 was considered to be statistically significant.

RESULTS

Total 50 numbers of children aged 6 -12 years were enrolled in this study of which 9 children defaulted. Out of 41 children, 75.7% were males and 24.3% were females. Majority (73.2%) belonged to nuclear family. 48.7% children were of 10 - 12 years of age group. 17% were previously on ADHD medication. None reported receiving complementary alternating medicine (CAM). 2 out of 41 (4.8%) children required combination of two medications to achieve optimal response. Only 3 out of 41 children reported mild loss of appetite and headache post medication. As per DSM -5 criteria, 92.6% were of ADHD- combined type, and 7.4% with inattentive type, none were hyperactive-impulsive type. 63.4% children were diagnosed with learning disability on formal educational assessment. 46.3% and 51.2% had co-morbidity of disruptive, impulse-control, and conduct disorders as reported by parent and teacher respectively. Table1 shows functional impairment in various domains in children as reported by parents and teacher on Conner's rating scale at baseline. Table 2 shows the mean of T-score among various subscales and they were approximately same as scored by both parents and teachers. T-score was observed high in learning problems compare to other sub groups implying that ADHD affects academic domain more severely compared to other functional domains. Table 3 shows the trend of Global Index T score on follow ups. A total score of < 65 indicates significant improvement in ADHD symptoms.

Table 1: Prevalence of functional impairment in various domains as per conner's rating scale at baseline.

Subscales on conner	Parent (N = 41)		Teacher (N = 41)	
Learning problems	39	95.1%	37	90.2%
Aggression	21	51.2%	22	53.6%
Peer relations	19	46.3%	18	43.9%
Global index	39	95.1%	39	95.1%
ADHD index	41	100%	41	100%

Table 2: Mean of T- scores of ADHD subscales on conner's rating scale.

Subscales on conner	Parent (N = 41)		Teacher (N = 41)	
	Mean	SD	Mean	SD
Learning problems	80.44	9.187747	78.96	10.21196
Aggression	68.08	15.0954	68.2	15.45632
Peer relation	65.26	14.01284	63.12	16.56236
Global index	73.88	9.944007	74.84	9.174855
ADHD Index	90.72	10.67524	86.6	9.510467

Table 3: Trend analysis across global index T- score on follow ups (baseline, 3 months, and 6 months).

Global index (T-score)	Significant score (T score >65)	Non-significant score (T score <65)
Baseline	39 (95.1%)	2 (4.9%)
3 months	26 (63.4%	15(36.6%)
6 months	10 (24.4%)	31(75.6%)

DISCUSSION

In our study, prevalence of ADHD was found high among males compared to females, which are consistent findings in all studies done before on children with ADHD. In our study, prevalence of ADHD was found more in age group belong to 10 - 12 years, in contrast to findings by other authors were prevalence was found in much younger age.[9,10] This finding could explain on basis of sample selection bias. In our learning disability clinic, average age of children referred with learning disability was 10-12 years.

Hence same prevalence got reflected in our study. Other variables of sample like type of family, socio economic group, and type of ADHD were same as finding reported by other authors in their studies.[4,9-11] Analysis showed significant changes in ADHD symptoms post multimodal intervention. Literature shows the evidence of improved efficacy of multimodal/combined intervention over medical management alone for reducing the core symptoms of ADHD.[4,11]

The improvement showed in our children goes well with existing literature that medications along with behavioral therapy are effective in reducing the core symptoms of ADHD.[4,11] In our study, we retrospectively studied group of children who did not showed clinical improvement at end of 6 months of multi modal therapy and found out that majority had co morbidity of disruptive, impulse-control and conduct disorders. They were more from below 8 years of age, males were predominately. They belonged to lower socio economic group. Inspite of optimal medication and behavioral modification therapy they didn't improve. So definitely they will require longer duration of currently available therapy for improvement. Further studies are needed to form treatment guidelines for children with ADHD and disruptive, impulse-control, and conduct disorders.

CONCLUSION

Multimodal intervention was found effective in treating children with ADHD. Presently available intervention is not found that effective in presence of disruptive, impulse-control, and conduct disorders in children with ADHD.

Further studies are required to improving available therapy in presence of disruptive, impulse-control and conduct disorders as co morbidities. This will help to reduce functional impairment and decrease of prevalence substance abuse in these children in future.

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