

Original Article

The Comparison of the Effectiveness of Parents Behavioral Training and Medication with Ritalin on the Rate of the Signs of Attention-Deficit Hyperactivity Disorder (ADHD)

Mina Shahrbanian M.Sc.^{1*}, Sirous Salehi Ph.D.², Ahadallah Azizi M.Sc.³

1. M.sc. in Psychology
2. Faculty of Psychology, Rasht Azad University, Rasht, Iran
3. Faculty of Psychology, Rasht Azad University, Rasht, Iran

Received: 5/20/2012

Accepted: 4/23/2013

Abstract

Introduction: The aim of the present research is to determine the effectiveness of parents' behavioral training in compare to medication on the rate of the signs of attention deficit hyperactivity disorder (ADHD).

Materials and Methods: Our population in this research was all boys in the elementary school (third, fourth and fifth grades) and finally a sample of 630 subjects were included. We used a questionnaire of children's morbid signs (CSI-4) which was completed by parents. For determination of acceptable scores in this scale, all subjects who obtained score 6 and more were selected and out of these subjects by use of random method as many as 45 subjects were chosen and 15 subjects were considered as the behavioral experimental group (under special care of a psychiatrist) and the other 15 subjects were randomly put as the control group. The parents participated in seven sessions of behavioral training program, while for control group no kinds of training and medication intervention were carried out.

Results: The results showed that both parent's behavioral training program and medication have been effective meaningfully on ADHD ($P=0.0005$), also considering the averages differences, medication with Ritalin has caused more reduction of the signs of ADHD than parent's behavioral training.

Conclusion: At present, for children afflicted with ADHD, multi interventions are recommended that contains medication and parents training.

Keywords: Hyperkinesis; Attention Deficit Disorder with Hyperactivity; Methylphenidate; Parents; Education; Pharmaceutical Preparations.

* **Corresponding Author:** *Tel:* +989111841459, *E-mail:* mina.shahrbanian@gmail.com

Introduction

The basic problem in children afflicted with hyperactivity is their inability in care and control of their behaviors. The hyperactivity disorder expresses in children in three different kinds: in the first kind of this disorder, besides the hyperactivity, impulsive performance (doing tasks suddenly) are seen in children. The second and the most widespread disorder is a kind that in which the hyperactivity and over activity are not observed, and the child shows only the signs of attention and concentration deficiency which this kind of disorder is diagnosed later and in school years. In the third kind of hyperactivity disorder, the child has both the signs of hyperactivity, sudden performance and attention and concentration deficiency^[1].

Parents' training in behavioral control is a basic component in the whole treatment of the most families having children afflicted with ADHD. Barclay have introduced a program for parents' training for special use for children afflicted with ADHD. Barclay's program has emphasis on behavioral control through its special consequences and specially the components of enforcement, silence and punishment. In this program, there is emphasis on the use of the methods of motivation, strong incentive and punishment techniques. Whatever is evident in these methods is this assumption that a therapeutically space must be created at home and more evident is that, the parents must learn how to come to terms with that is likely the chronic problem, not such that they cure it^[2].

Therapeutically medication in control of the signs of this disorder would also be effective. These drugs control both the signs of hyperactivity and the signs related to the inattention and weak concentration. From disorders accompanied with hyperactivity, anxiety, depression and reduction of self-confidence in these children and also the learning of disorders in taking a spelling test and the reading from a written text and mathematics can be mentioned^[3].

Kalantari and colleagues (2001) showed that the medication in the stage after the treatment had a significant effect on the reduction of the signs of children's hyperactivity under the study^[4]. Gorji (2005) investigated the effectiveness of the application of the methods of behavioral change in parents' and the combination of them on the reduction of the signs of ADHD. The obtained results with one way variance analysis showed that the trainings of the methods of the behavioral correction on parents, teachers, parents and teachers simultaneously has not established meaningful reduction in the signs of ADHD^[5]. Fathi determined that parents training program has been effective on the reduction of the signs and relative improvement of ADHD^[6]. Scott in an investigation taught the principles of therapeutically cure to the parents of children who had hyperactivity during 6 sessions of ninety minutes. His results showed that the behavior of the children whose parents attended the training sessions had improves meaningfully in comparison with the control

group. This improvement was also stable in three and six months of follow-up. The result of this research showed that the training of parents' behavior both in the form of group and individual can be effective^[7].

The treatment of children afflicted with ADHD requires the medical, educational, behavioral and psychological interventions. This therapeutic method is called multi-model treatment and includes parents training for the management of the behavior of child and parents, usage of the stimulant drugs and school programming and support. Strategies such as adjustment, and usage of positive enforcements could cause children's active attendance and their parents in programs in this direction. Therefore considering the above mentioned issues and explanations, the aims of the present research is to determine the effectiveness of the parent's behavioral training and medication with Ritalin and their comparison on the signs of ADHD. Research hypothesis is that there is difference between behavioral training and medication with Ritalin on the reduction of the signs of ADHD.

Materials and Methods

The population of the present research is all boy students of all pre-school in Bandar Anzali city in the year of 2011. By use of the simple randomly method, 7 boys of elementary school among the district of the education in Bandar Anzali were selected and out of each school, the grades of third, fourth and fifth were taken into consideration as sample. In this way, as many as 630 subjects were on the whole taken

into consideration. The students' parents completed the questionnaire of the children's morbid signs (CSI-4). 487 questionnaires were suitability returned back for scoring. Out of all students, those who obtained score 6 and more in the questionnaire (CSI-4) were selected. 112 subjects who were qualified and on the basis of the questions and showed the signs of hyperactivity were referred to the psychiatrist. As many as 71 individuals were approved by the psychiatrist. By use of a simple randomly method, as many as 15 individuals were included in medication group with Ritalin under the supervision of the relevant psychiatrist 15 individuals in the group of the behavioral training to parents (in seven sessions once a week). In addition, 15 subjects considered as control group without any therapeutic and educational program. In the end of the medication and the completion of the sessions of behavioral training to parents, both the experimental group and control group were again evaluated on the basis of the questionnaire of CSI-4.

$R_E T_1 X T_2$

$R_C T_1 _ T_2$

This questionnaire is a rating scale of the behavior which at the first time was made by Sprafkin, Loney and Gadow according to the classification of DSM-III with the name of SLUG. Its aim is to screen 18 behavioral and emotional training of children aged 5-12 years old. Later, accompany with changes of DSM, this tool was again revised and was published in the year of 1994 with edition of DSM-IV with a little revision with the name of CSL-4.

This scale includes two forms of teacher and parents that on a whole contains seeking-efficiency and is a suitable alternative for standard interview in psychiatry which the teacher's form contain 112 questions including 11 main groups and an extra group of behavioral disorder. Each of these groups has its special subgroups and contains its relevant questions.

The disorder under the survey is consistent with the questionnaire of CSI-4, the questions are at the degree 4 of Likert scale and the condition of the subjects in terms of severity is measured as never, sometimes, most often and always. The scoring method in this questionnaire is: never=0, sometimes=1, most often=2, always=3, which from the sum of the numbers, the numbers of the sign's severity is obtained, which in this relation it is connected with the method of scoring of the kinds of disorder in ADHD, the existence of the attention deficit- hyperactivity-impulsiveness. In this questionnaire, the nine-fold signs of hyperactivity-impulsiveness in the form of the term of 10-18 are listed. The standard score for each of them is score 6 and if the subject's score in the standard of the inattention is 6 or more than that, the diagnosis is the disorder of

the hyperactivity-attention deficit and is the kind of inattention. If any subject in both groups which his relevant term, is related to the signs of hyperactivity-impulsiveness having score 6 or more than that, the diagnosis is the kind of combination.

In this research, multivariate covariance analysis (MANCOVA) has been used for the investigation of the research hypothesis. Covariance analysis allows the researcher to investigate the effect of an independent variable on dependent variables and eliminates the effect of the other variables. Before the performance of the multivariate covariance analysis, at first its premises namely: homogeneity of the regression, having linear relation, the existence of the interval between data, being normal of the distribution and being random of the data and dependent variable are investigated. All statistical analysis has been carried out by the help of the spss₁₈ software.

Results

Our hypothesis was that there is difference between the parent's behavioral training and medication with Ritalin on the reduction of the child afflicted with ADHD.

Table 1. Premise of the equality of variance error

Level of meaningfulness	d.f ₂	d.f ₁	f				
0.184	42	2	1.760				
Premise of the homogeneity of the regression gradient							
Source of Changes	Number of Squares SS	Freedom Degree df	Mean Squares ms	F	Significance Level P	Effect Size Eta	Test Power
Balance of Independent Group and Pre-test	8.054	2	4.027	2.060	0.141	0.096	0.398

In the premise of the equality of the variances error, since the significance level has been more than 0.05, so the premise of the equality of the Table 1 showed that the significance level of the interaction between

the independent group and pre-test of the signs of hyperactivity is more than $P=0.5$, so the calculated f is not statistically significant and the premise of regression gradient is confirmed.

Table 2. Scores of means and standard deviation of pre-test and post-test and differentiation of the experiment group and control group

Variables	Group of the Parents Behavioral Training		Medication Group with Ritalin		Control Group		
	X	S	X	S	X	S	
Pre-test of the Signs of Hyperactivity	17.27	3.39	18.87	2.26	15.53	3.69	
Post-test of the Signs of Hyperactivity	11.13	1.76	7.40	2.13	14.26	2.96	
Means of the adjustment and standard deviation of the rate of the signs of hyperactivity in the parents behavioral training group and medication group with Ritalin and control group.							
Variables	Group of the Parents Behavioral Training		Medication Group with Ritalin		Control Group		
	X	S	X	S	X	S	
Pre-test of the Signs of Hyperactivity	11.314	0.371	7.520	0.370	13.96	0.372	

Table 3. The results of the covariance analysis for the variable of the signs of hyperactivity between parents behavioral training group and medication with Ritalin with control group

Source of Changes	Number of Squares SS	Freedom Degree df	Mean Squares ms	F	Significance Level P	Effect Size Eta	Test Power
Group	312.477	2	156.238	76.011	0.0001	0.788	1.000

On the basis of the results obtained from the table 3 and after the adjustment of the means score of pre-test at the amount of 14.33 for the variable of the sign of hyperactivity, for the analysis of the dependent variable of the signs of ADHD in two groups of experiment and control, considering the calculated (F (d.f=2.41)=76.011, P<0.0005, $\eta^2=0.788$), since the significance level is less than P=0.005,

therefore calculated F is statistically significant. And considering the calculated effect size of the amount of 0.788 which is more than the amount of 0.14, it is representative of the much effect of the parent's behavioral training and medication group with Ritalin on ADHD. So it can be said that there is significant difference between the score of the post-test of the signs of ADHD in both groups of experiment and control.

Table 4. Covariance analysis between parents' behavioral training group and medication group with Ritalin on the rate of the hyperactivity.

Source of Changes	Number of Squares SS	Freedom Degree df	Mean Squares ms	F	Significance Level
The variable of the Hyperactivity	107.908	1	107.908	52.498	0.0001
Error	84.274	41	2.055		

Table 5. The comparison of the difference of the means of the signs of the hyperactivity between parents' behavioral training group and medication group with Ritalin

Groups	Mean Difference D.m	Standard Deviation S	Significance Level P
Parents' Behavioral Training Meditation with Ritalin	3.793	0.524	0.0001

As shown in table 4, since the significance level is less than P=0.005, it was determined that there is difference between the rate of

effectiveness of parents' behavioral test and medication with Ritalin on the reduction of the ADHD. The difference between two groups

determined that the mediation group with Ritalin has been more effective than parents' behavioral training on the reduction of ADHD. Therefore we can calculate with 99% of confidence that there is difference between parents' behavioral training and medication on the reduction of the signs of hyperactivity of the children afflicted with ADHD.

Discussion

This research is consistent with the findings of Mirzaeiyan and colleagues (2006) ^[8], Kalantari and colleagues (2001) ^[4], Gorji (2004) ^[5], Fathi (1995) ^[6], Simcon & Doma (2009) ^[9], Scott (2005) ^[7], Christensen & Sprague (2005) ^[10]. At present, for children afflicted with ADHD, multi interventions are recommended that contains medication and parents training.

Medication is necessary for the ADHD; in fact stimulus drugs whether alone or in combination with other medications usually is among the most common therapeutic approach for ADHD. Besides, the use of the medication can also help in becoming more effective of the program of multi-aspect therapy. The parents' behavioral training could improve the relation of the parents and children and adjustment of the family through the training of the parents effective skills and establishing family therapy for dependence and continuity of parents and children, family's correlation and the management of the solving problems and stresses. On the basis of the approach of the parents' behavioral training, the reinforcement or punishment system which the

parents of hyperactive children establish in family is to a large extent dependent to their tolerance. The parent's who have the higher tolerance threshold, consider the children's behavior to some extent aggression, impoliteness and rudeness without paying attention to it. On the contrary, the parents who have the lower tolerance threshold may cause the children's behavior towards withdrawal and being shy. Therefore before any kind of change in the behavior of the hyperactive child, there must be a kind of behavioral change in their parents.

In fact, the main object of the treatment in this method of therapy has been the behavioral change of parents. The training of the parents' behavior who have hyperactive children in the upper classes of society, smart families with high education and the families who are in better conditions in terms of good health, will have better and more effect. The training of skills of the control of hyperactive children to their parents is very effective in the direction of the better training of children. The parents' training will improve the feeling of self-sufficiency and helps the increasing of the parents' mental good health level and the improvement of the relation between the members of the families of the hyperactive children significantly. This time training program can be effective in parents who have enough motives not to behave against their conventional habits. At one time the parents' behavioral training could cause a suitable change in hyperactive child's behavior which all members of the family also have knowledge

of the execution method of the behavior therapy and as well have enough motives for its fulfillment.

The program of the parents behavioral training for the purpose of the correction of the behavior of hyperactive child also leaves impact on the parents' behavior themselves. Mothers of the hyperactive children show more negativism in interaction with their children, and in these families most members show more negative reaction to the children's behaviors, because contrary to ordinary child, hyperactive children do not give suitable feedback to their parents' demands and cause them to become angry.

Parents' behavioral training with behavior control cause the families to find standards and rules for their opportunities and not to use despotic methods in interaction with the hyperactive children. Parents' behavioral training of children having ADHD could cause the improvement of adjustment in daily cares and in programing by use of reinforces and executing penalties. Simply it can be said that a child behaviors the way he has grown up by his parents. In some cases even using drugs could cause the improvement of the level of establishment of the relations of these children with their peers, parents and also their teachers. Most children afflicted with ADHD show positive reaction to different drugs which are

usually prescribed for them and they don't face with a hard situation after taking the drugs. Medication provides the reduction of the sever signs of the ADHD in children have had problems. Use of the more widespread of statistical universe for better generalization of results, increasing the sessions of the parentsbehavioral training and the investigation of the process of the improvement of the participants in a larger time after the execution could be effective in the execution of subsequent researchers for the investigation of the mental, social and character state of the participants in a time after completion of the training intervention in later researches.

Conclusion

We conclude that there is difference between the rate of the effectiveness of the parents' behavioral training and medication with Ritalin on the signs of hyperactivity. The difference of the means of the two groups determined that the medication with Ritalin has been more effective than the parents' behavioral training on the reduction of the signs of hyperactivity. Therefore it was calculated that the research hypothesis to the effect that there is difference between the parents' behavioral training and medication with Ritalin on the signs of the ADHD is confirmed.

References

1. Alhambra MA, Fowler TP, Alhambra AA. (1995). EEG biofeedback: A new treatment option for ADD/ADHD. *Journal of Neurotherapy*. 1995; 1(2):39-43.
2. Kratochwil R, Morris R, Thomas A. *Clinical Child Psychology (therapy approaches)*. Second edition. [Naynyan M, loss g trans]. Tehran: Growth; 2002. [Persian]
3. Sadock BJ. Kaplan and sadock poket handbook of clinical psychiatry. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2005.
4. Kalantari M, Neshatdoost H, Zarei M. Effect of parent behavioral training and drug therapy on symptoms of attention deficit hyperactivity disorder in children with hyperactivity. *Journal of Psychology*. 2001; 18:118-35.
5. Gorji Y. Evaluate and compare the effectiveness of behavior modification techniques used by parents, teachers, and combine both in reducing symptoms of attention deficit hyperactivity disorder and primary school students (MSc thesis). Tehran: Allameh Tabatabai University; 2004.[Persian]
6. Fathi A. Impact management training to parents in reducing attention deficit disorder – ADHD (MS Thesis). Tehran Psychiatric Institute, 1995. [Persian]
7. Scott MJ. 2005. The evaluation of a group parent training program. *Behavioral Psychotherapy*, 15: 224-239.
8. Mirzaeiyan B, Ahadi H, Pasha Sharifi H, et al. release. Impact of maternal education on child management skills to reduce symptoms of attention deficit - hyperactivity in children and maternal depression. *Science and Research Branch, Islamic Azad University, Isfahan Psychology*. 2006. 29:102-81. [Persian]
9. Simcon F, Doma A. The comparative effectiveness of behavioral parent training and cognitive on ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2009; 28:480-5.
10. Christensen DF, Sprague RI. Reduction of hyperactive behavior by conditioning procedures alone and combined with methylphenidate (Ritalin). *Behav Res Ther*. 1973; 11(3):331-4.