

Evaluation of Bupropion and Venlafaxine in Children with ADHD

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Abstract

Background: As it is defined stimulants are the first choice in the treatment of ADHD patients but some patients cannot use it because of side effects or poor response. It seems we need to use drugs from antidepressant group like venlafaxine and bupropion that have the same effect and define which one is more effective. In this study these are answered. Therefore 40 children with ADHD between 7 to 11 years old were selected after psychiatric interview and received ADHD and Conner's rating scale. The first group took venlafaxine and the second group took bupropion. The two groups were evaluated as pre- and post-test by Conner's and ADHD rating scale.

Result: Bupropion and venlafaxine were both effective on those children and their efficacy were compared in the entire sample and for boys and girls separately by using one-way analysis of covariance. There was no significant difference between the two groups in general and separately within males and females of the two groups.

Discussion: This article shows that venlafaxine and bupropion are both effective on decreasing symptoms of ADHD. The response rates are the same in the two groups.

Keywords: ADHD; Venlafaxine; Bupropion

Introduction

The question is which antidepressant group drug is more effective if stimulant drugs cannot be used because of poor response or side effects.

Rene L. Olvera in a study achieved 44% improvement with venlafaxine on 16 children with ADHD with a mean age of 11.6 with drug dose of 1.4 mg/kg [1].

Hedges D et al. had a good response with drug dose of 96 mg venlafaxine in 8 of 18 patients with ADHD. 11 patients tolerate the medication and seven patients discontinued it due to its complications [2].

Timothy E. Wilens and colleagues found 76% improvement on 21 patients (versus 19 patients in the control group), out of which 56% had good response [3]. Robert L. Findling reached positive effect on children 5-17 years old of ADHD with venlafaxine in three doses of 0.5, 1 and 2 mg/kg [4].

Barrickman LL found that Ritalin and bupropion were similar in response rate on 15 patients 7-17 years old with ADHD and Popper CW showed that bupropion and other tricyclic anti-depressant reduce the behavioral signs and somewhat cognition on children with ADHD [5,6]. Mohamadreza Sadramely compared bupropion with placebo on 40 children between 6-17 years old with ADHD in two groups of 20 and achieved partial response [7]. Timothy E. Wilens studied the effects of bupropion for 6 weeks on 21 adult patients with ADHD that achieved appropriate response [8]. W. Bursleson Daviss studied on 24 adolescents between 11-16 years old with ADHD + depression. He showed that Bupropion is effective for both disorders on patients with ADHD + depression with maximum dose of 3 mg/kg. [9]. Findling RL found out that venlafaxine had good response on 7 cases out of 9 in the treatment of adults with ADHD [10].

Hedges D treated 16 adult patients who were diagnosed with adult ADHD for 8 weeks with drug doses of 25-225 mg/day venlafaxine and achieved reduction in half of signs and symptoms in 12 patients [11].

Wim Verbeeck in review of literature for the effects of antidepressants in the treatment of ADHD found positive effects of bupropion therapy in 5 of 8 studies [12].

Method

The general aim of this study was to compare the therapeutic effects of venlafaxine with bupropion in children with hyperactivity and attention-deficit (ADHD) in general and on boys and girls separately. Therefore, in this study, 40 children with ADHD between 7 to 12 years who were admitted to child and adolescent psychiatric clinic in Mashhad, Iran and diagnosed through psychiatric interviews according to DSM -V criteria and ADHD and Conner's rating scale that suffered from side effects or lack of response to Ritalin were enrolled. Informed consent was taken from the parents. These children were divided into two groups of 20. In the first group Venlafaxine dose was started with 0.5 mg/kg in the first week and 0.1 mg/kg were added every week so that it reached 1.4 mg/kg in the 10th week. In the second group, bupropion was started with 1.4 mg/kg in the first week and 0.51 mg/kg was added every week so that it reached 6 mg/kg in the 10th week. In both groups previous dose of Ritalin were given in the first week and in the second week Ritalin was given half a dose and finally deleted from the third week.

Results

Findings in this study showed that comparison between the two groups in IQ test with t test for equality of means ($F=0.022$ and $p=0.398$) and Levin's test ($p=0.693$) were not significant between the two groups. So the two groups were matched.

And also according to age, the t- test of the two groups for equality of means showed no significant difference ($p = 0.535$). Education level

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of the two groups in squared K test showed no significant difference ($p=0.570$).

Sex differences in the two groups with squared K test were not significant ($p=0.744$).

ADHD questionnaire ($t=-0.339$, $p=0.737$) and Conner's questionnaire ($t=0.552$ and $p=0.585$) showed no significant difference.

These findings show that the two groups are matched in IQ test, age, sex, education and severity of signs and symptoms. The efficacy of Bupropion and venlafaxine via ADHD test that compared with one-way covariance test is shown in Table 1. According to the above results ($F=39.765$, $sig=0.000$), each group had significant effects by intervention ($p<0.05$), but the difference between the two groups ($F=0.199$, $sig=0.659$) were not significant in this regard ($p>0.05$).

The efficacy of Bupropion and venlafaxine compared with one-way covariance test through Conner's test shown in Table 2. According to the above results ($F=30.920$, $sig=0.000$) each group had significant effects by intervention ($p<0.05$), but the difference ($F=0.521$, $sig=0.478$) between the two groups were not significant in this regard ($p>0.05$). These findings shows that both drugs in the two groups had appropriate effects but the difference in effects of the two drugs were not significant.

The efficacy of Bupropion and Venlafaxine that was compared with one-way covariance test with ADHD test on boys between two groups is shown in Table 3.

According to the above results ($F=19.550$, $sig=0.000$) boys in each group had significant effects by intervention ($p<0.05$), but the difference ($F=0.099$, $sig=0.756$) between boys in the two groups were not significant in this regard ($p>0.05$). The efficacy of Bupropion and venlafaxine compared with one-way covariance test by ADHD test in girls between the two groups is shown in Table 4. According to the above results ($F=12.459$, $sig=0.006$) girls in each group had significant effects by intervention ($p<0.05$), but the difference ($F=0.199$, $sig=0.666$) between girls in the two groups were not significant in this regard ($p>0.05$).

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|--------|------|
| Effect of intervention | 1 | 816.447 | 39.765 | .000 |
| Interaction of interference effect in groups | 1 | 4.084 | .199 | .659 |

Table 1: The efficacy of Bupropion and venlafaxine by ADHD test.

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|--------|------|
| Effect of intervention | 1 | 3026.652 | 30.920 | .000 |
| Interaction of interference effect in groups | 1 | 50.980 | .521 | .478 |

Table 2: The efficacy of Bupropion and venlafaxine by Conner's test

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|---------|------|
| Effect of intervention | 1 | 521.580 | 521.580 | .000 |
| Interaction of interference effect in groups | 1 | 2.652 | 2.652 | .756 |

Table 3: The efficacy of Bupropion and Venlafaxine by ADHD test on boys between the two groups

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|--------|------|
| Effect of intervention | 1 | 203.407 | 12.459 | .006 |
| Interaction of interference effect in groups | 1 | 3.249 | .199 | .666 |

Table 4: The efficacy of Bupropion and venlafaxine by ADHD test in girls between the two.

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|--------|------|
| Effect of intervention | 1 | 2659.767 | 21.503 | .000 |
| Interaction of interference effect in groups | 1 | 8.047 | .065 | .803 |

Table 5: Bupropion and venlafaxine efficacy with using the Conner's score for boys

| Source | df | Mean Square | F | Sig. |
|--|----|-------------|--------|------|
| Effect of intervention | 1 | 747.107 | 22.531 | .003 |
| Interaction of interference effect in groups | 1 | 93.676 | 2.825 | .144 |

Table 6: Efficacy of Bupropion and venlafaxine by using the Conner's score for girls

Bupropion and venlafaxine efficacy were compared in the total sample by one-way analysis of covariance using the Conner's score for boys (Table 5). According to the above results ($F=21.503$, $sig=0.000$), each group had significant effects by intervention ($p<0.05$), but the difference ($F=0.065$, $sig=0.803$) between boys in the two groups were not significant in this regard ($p>0.05$). Efficacy of Bupropion and venlafaxine were compared in the total sample by one-way analysis of covariance using the Conner's score for girls (Table 6).

According to the above results ($F=22.531$, $sig=0.003$), each group had significant effects by intervention ($p<0.05$), but the difference ($F=2.825$, $sig=0.144$) between girls in the two groups were not significant in this regard ($p>0.05$). Significant difference of response rate in each group and no significant difference of response rate between the two groups show that intervention in each group were effective but there were no difference between bupropion and venlafaxine in boys and girls and between the two groups as a whole.

Discussion

This study showed that there were significant difference in response rate in each group and no significant difference between the two groups. Intervention in the two groups decreased signs and symptoms of ADHD effectively but there were no difference between the effects of bupropion and venlafaxine in decrease of symptom of ADHD. This study is compatible with Hedges D and Findling RL who had positive results with venlafaxine in ADHD and also compatible with studies done by Popper CW and W. Burselson Daviss and Mohamadreza Sadramely and Timothy E. Wilens that had positive results of bupropion in ADHD.

Conclusion

This study helps child-psychiatrists in cases where patients do not respond to Ritalin or have side effects with stimulant drugs. They can use venlafaxine or bupropion in the second line and there is no priority between them.

Limitation

The research population was among children with ADHD who were Ritalin-resistant or had side effects using Ritalin.

Suggestion

Comparison of the effect of Atomoxetine with those of Bupropion and Venlafaxine is suggested.

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Implications for educators

In case of treating children with ADHD who are resistant to stimulant or have side effects, Venlafaxine and Bupropion are effective substitutes.

The effectiveness of Venlafaxine in those children is similar to that of Bupropion.

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