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The use of the bender visual motor gestalt test with substance abuse patients

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Abstract

The aim of this study was comparison of the function of patients with substance abuse disorder and normal individuals in Bender Gestalt Test. Two hundred volunteers (100 patients, 100 normals) were included in this research. The result showed that the clinical group has higher number of errors in Bender-Gestalt test than the non clinical group. This result can be explained in terms of several mechanisms including visual–perceptor, visual–motor deficits, attention and executive functions impairment (response inhibition & decision-making) and cognitive impulsivity. Other possible reason for this difference between the two groups is neuropsychological alterations prior to the drug use and the existence of neuropsychological impairments that are produced as a result of drug use.

Keywords: BENDER Visual-Motor Gestalt Test, Substance Abuse Disorder

1. Introduction

THE BENDER-GESTALT\textsuperscript{1} has been used extensively as a screen for organic brain and as a projective test of pathology (3). Although Loretta Bender was the person responsible for creating the Bender-Gestalt test in the late 1930s, she did not actually create the figures themselves. She selected nine figures from a larger sample of geometric designs developed by Max Wertheimer, a Gestalt psychologist (Hutt, 1969). Bender was interested in how people perceived visual patterns as organized configurations or Gestalts. She and other investigators subscribing to the Gestalt school believed that an individual’s tendency to perceive things as unified configurations rather than disjointed minutiae is a function of the maturational process. In other words, as individuals mature and develop, their ability to perceive at the fullest level (i.e., Gestalt) is reached only at some pivotal point of maturation. Bender investigated how a variety of external influences such as organic, emotional, toxic, or traumatic factors might affect perception. More specifically, Bender investigated how various clinical syndromes (i.e., schizophrenia, aphasia, organic brain damage, manic depressive psychosis, certain toxic disorders, and other mental conditions) would alter an individual’s perception of Gestalten. She hypothesized that any of these clinical syndromes could alter the maturational process of perception, with a subsequent regression and tendency to perceive figures in a more primitive fashion (3). Sheikhj Naibin, Jazayeri, Moazemi, & Delavar (1998) suggested that there is no significant difference between Bender Gestalt and MRI imaging (8).

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Research on the impact of substance use on visual-motor activities has been scarce both in the East and the West. Brown and Partington (1942) studied the intellectual functions of 371 native, white, male narcotic drug addicts by comparing their performance on the Wechsler-Bellevue Intelligence Scale with the normative data of the test as well as the performance of a group of 42 hospital attendants. No significant differences on the Full scale, Verbal scale, and Performance scale IQ scores were reported. Strang and Gurling (1989) believed that substance-specific effects of heroin on neuropsychological functions should be examined within the context of long-term use of high doses of heroin. They recruited seven participants according to this criterion. Apart from the slightly poor performance of the recruited heroin addicts on tests of perceptual-motor speed and verbal recognition memory, a striking observation of this study was that daily use of high doses of heroin on a long-term basis did not produce any deleterious effect on cognitive functioning (6). Korin (1974) studied perceptual-motor disturbance among psychotic heroin addicts, nonpsychotic heroin addicts, psychotic nonopiate addicts, and nonpsychotic nonopiate addicts. They concluded that perceptual-motor deficits were associated with heroin used. Both psychotic and nonpsychotic heroin addicts committed more errors on the Bender-Gestalt Test. Moreover, the heroin addicts were found to have an increased number of perseveration errors and rotations in their drawings as well as constricted use of space of paper when compared with the nonopiate addicts. Hill and Mikhael (1979) studied the neuropsychological functions of the tactual-spatial memory and fine motor skills of the heroin addicts, and observed that they performed worse than the normal controls. Weinstein and Shaffer (1993) suggested that drug addiction could lead to neuropsychological deficits in seven areas, namely decreased spontaneity, difficulty in mental and/or behavioral shifting, difficulty in sustaining attention, impulsiveness, impaired social awareness, impaired insight, and impaired abstract reasoning. These seven areas of deficits are indeed deficits of frontal executive functions, which can be recategorized into three major domains: (1) attention, (2) impulse control, and (3) mental flexibility and abstract reasoning (6). We conclude that relative to other psychopathological disorders (such as schizophrenia) the severity of neuropsychological impairment in cocaine addiction is modest, albeit not indicative of the absence of neurocognitive dysfunction. Therefore, the aim of this study was the use of the Bender Visual Motor Gestalt Test with substance abuse patients.

2- Method

2.1. Sample

The clinical sample consisted of 100 male patients recruited to participate in the study, from 3 outpatient clinics in Khorramabad. The mean age of the patients was 29.12±5.17 yrs. The age range was 17-48 years. The non-clinical sample consisted of 100 normal adults (100 male). They were recruited from the general population. The mean age of the non-clinical sample was 28.85±5.65 yrs. The age range was 18-46 years. 51 percent of clinical sample and 50 percent of non-clinical sample had diploma. Within 40 percent of clinical group the age of onset abuse were 15-20 yrs. The table No.1 indicates the frequency of the clinical sample according to the type of substance they use. The highest frequency way of using drug was smoking (69%).

<table>
<thead>
<tr>
<th>frequency</th>
<th>opiates</th>
<th>crystal</th>
<th>crack</th>
<th>mixed</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>48</td>
<td>2</td>
<td>11</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>

2.2. Measures

THE Bender Visual Motor Gestalt Test: The Bender Gestalt Test consists of nine cards each displaying an abstract design. Bender (1938) adapted these stimulus designs from those originally used by Wertheimer (1923). Bender (1938) saw her test as being particularly relevant to the assessment of cognitive maturation and the diagnosis of organically based pathologic. When administering the test, the examiner presents the cards to the test-taker who is required to copy each design as accurately as possible. No time limits are imposed. Standard administration requires the designs to be copied on a blank unlined sheet of paper with HP pencil. The individual's designs are then rated on their relative degree of accuracy and overall integration. The following instructions are then given to the
examinee: "I am going to show you some cards (points to), one at a time. Each card has a simple drawing on it. I want you to copy them on the paper as well as you can. Work in any way that is best for you. This is not a test of artistic ability but try to copy them as accurately as possible". The performance of participants in Bender Gestalt Test scored based on Lacks’ scoring system (5). Generally, 3 or fewer errors indicate an absence of deficits or brain impairment; 4 errors is a borderline score; and 5 or 6 errors provide some evidence for brain impairment. The greater the number of errors, the greater the evidence for some type of brain impairment: strong evidence with 7 or 8 errors.

2.3. Statistical analysis

Analysis of the data involved both descriptive and inferential statistics including frequency, percentage, standard deviation & chi-square Test.

3. Results

The performances of participants in Bender Gestalt Test based on Lacks’ scoring system are presented in Table2. The clinical sample has higher error on the Bender-Gestalt Test. The highest error in clinical sample and non clinical sample is simplification and collision.

Table2. Bender Gestalt test scoring based on Lacks’ scoring system

<table>
<thead>
<tr>
<th>group/error</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>group1</td>
<td>45</td>
<td>24</td>
<td>51</td>
<td>15</td>
<td>22</td>
<td>29</td>
<td>40</td>
<td>4</td>
<td>39</td>
<td>4</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>group2</td>
<td>14</td>
<td>2</td>
<td>45</td>
<td>15</td>
<td>11</td>
<td>2</td>
<td>56</td>
<td>3</td>
<td>10</td>
<td>-</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

A Chi-Square Test was performed on the error number to compare the clinical and non-clinical groups in this variable. Clinical and non-clinical groups differed significantly on the Bender- Gestalt Test (Table No.3).

Table3. chi square test

<table>
<thead>
<tr>
<th>pearson chi-square</th>
<th>d.f</th>
<th>sig</th>
</tr>
</thead>
</table>
| 68.76              | 7   | ....

4- Discussion

The main findings of the present study were: The patients of substance abuse disorder had higher rates of error than non-clinical sample on the Bender- Gestalt Test. Drug use and addiction constitutes complex phenomena of multi-determined etiology and individual, interpersonal and social consequences that are still, in many cases, unapproachable. From a neuropsychological point of view, these phenomena have been examined from a double perspective. On the one hand, diverse studies suggest that neuropsychological alterations prior to the drug use could predispose the subject toward it through various mechanisms, such as an excessive sensitivity to the reinforcement or failure of the impulse control mechanisms (10). The self medicating hypothesis proposes that individuals use substance in order to cope with negative affects (Kantzian, 1975). This contention is supported, in part by the proclivity of individuals with certain disorders to use particular drug. For example, researchers have demonstrated that individuals with diagnosed with ADHD disorder are more likely to use cocaine as other illicit substances (7). On the other hand, various studies in the area have pointed out the existence of neuropsychological impairments that are produced as a result of drug use. These impairments seem to be associated with the cumulative neurodegenerative effects exerted by the drugs on several brain areas, and can affect the visual–perceptor, visual–motor, attentional, memory and executive functions (10). Recent works show that chronic use of psychoactive substances produce significant deficits in executive control functions (ECF), and, particularly, in domains related with response inhibition and decision making. These deficits have been associated with anterior cingulate (ACC)/prefrontal cortex (PFC) dysfunction. Accordingly, recent neuroscientific models of addictive behavior have proposed a critical role of PFC circuitry in the breakdown of inhibitory control that characterizes transition from casual-recreational drug use to substance dependence (1, 2, 9). In summery, the neuropsychological alterations prior
to the drug use and existence of neuropsychological impairments that are produced as a result of drug use can explain these results.

Previous studies have demonstrated that cocaine and amphetamine PSA usually present increased response latencies and a higher number of commission errors in tests of response inhibition, such as the Stroop, Go/No Go and Stop-Signal tasks (9). Heroin polysubstance users, on the other hand, have shown lack of forethought and impulsivity signs in future orientation, delay-discounting and decision-making-related tests (4). It has been argued that executive deficits may contribute to drug use and negatively affect the function of these patients. Finally, Bender Gestalt Test can be used as an aid to recognize brain damage and screening in psychology clinics in order to avoid unnecessary imaging of the brain. Limitations such as the sample size, the type of sample, call for further works. Furthermore, future research should confirm and extend this result.

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References