The feasibility of the polygraph examination in psychotic patients

Peer review status:
No

Corresponding Author:
Dr. Shmuel Hirschmann,
Dept. Head, Sha'ar Menashe Mental Health Center, Mobile Post Hefer, 37806 - Israel

Submitting Author:
Dr. Shmuel Hirschmann,
Dept. Head, Sha'ar Menashe Mental Health Center, Mobile Post Hefer, 37806 - Israel

Other Authors:
Ms. Ilana Guzner,
Animal Assited Therapist, Department B Sha'ar Menashe Mental Health Center - Israel
Dr. Lilac Lev-Ari,
Statistician, Department of Behavioral Sciences, Ruppin Academic Center - Israel

Article ID: WMC004663
Article Type: Research articles
Article URL: http://www.webmedcentral.com/article_view/4663
Subject Categories: PSYCHIATRY
Keywords: Polygraph, forensic psychiatry, expert testimony, Not guilty by reason of insanity, insanity plea, criminal responsibility, diagnostic validity/stability

How to cite the article: Hirschmann S, Guzner I, Lev-Ari L. The feasibility of the polygraph examination in psychotic patients. WebmedCentral PSYCHIATRY 2014;5(8):WMC004663

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:
The study was not funded

Competing Interests:
The authors have no competing interests to report
The feasibility of the polygraph examination in psychotic patients

Author(s): Hirschmann S, Guzner I, Lev-Ari L

Abstract

Objectives: To determine feasibility of using polygraph in psychotic subjects. The authors hypothesized that examination of psychotic patients will demonstrate that patients will generally regard psychotic content as the truth, and aside from their psychotic content, the polygraph will detect truths and non-truths as in all other individuals.

Participants and Methods: We examined polygraph validity in psychotic patients and compared test results with psychiatric evaluations. Twenty-three inpatients with DSM-IV schizophrenia or schizoaffective disorder, with delusions, who provided informed consent, were evaluated. Patients were asked trivial true/false questions, to calibrate lie detection. A senior psychiatrist defined the content of delusions of patients with active psychoses immediately prior to examination. Delusional content was then refined into a yes/no question and used for the polygraph tests. Scores of the Brief Psychiatric Rating Scale that assessed symptom constructs were then correlated with polygraph findings.

Results: 17/23 polygraph examinations were valid and confirmed that patients believed that the psychotic-content of their delusions was true; in the remaining domains, the patients responded similar to the general population.

Conclusions: Preliminary data indicate that polygraph tests are useful in the evaluation of patients with severe psychiatric illnesses. These findings are innovative regarding the efficacy of polygraph testing among the mentally-ill.

Introduction

Polygraph tests enable visual examination of the relationship between the psychological and physiological states of the subject. The modern polygraph was developed from instruments originally designed in the United States in the early 1900s by William Marston, Dr. John Larson (a psychiatrist), and Leonarde Keeler, mostly for use in criminal investigations. Studies of polygraph reported rates of 80-95% validity for tests used in allegations in criminal cases. Similar percentages of false positives and false negatives (approximately 2-3%) have been reported.

A variety of psychological and physiological processes, including some that can be consciously controlled, might affect polygraph test results. It was generally accepted that schizophrenia patients have a reduced physiological response to various stimuli. The use of medications and movement disorders including tardive dyskinesia reduce the validity of the test, however no substantial systematic research was performed to validate the extent of the effects. Current research suggests increased sympathetic tone and increased skin conduction with exacerbation of the mental state.

Polygraph is increasingly being used in law enforcement and governmental interrogations. If used appropriately, might there be a role for polygraph testing in the assessment and treatment of forensic patients? Lynch examined a series of lie detection examinations given to 13 patients accused of homicide and referred for psychiatric evaluation. He found that determinations of truthfulness or deception might be useful in determining an individual’s ultimate responsibility for an offense in the overall psychiatric assessment.

Raskin insisted that research has indicated that the polygraph test procedures are able to penetrate the faking of sociopaths, and even to overcome obviously fallacious but strongly held delusional beliefs in psychotic patients, and to overcome other attempts to fool the machine such as by taking medication or by inducing pain to mask other responses.

The authors hypothesized that examination of psychotic patients will demonstrate that patients will generally regard psychotic content as the truth, and beyond the boundaries of their psychotic content, the polygraph will detect truths and non-truths as in all other individuals.

Methods

The authors systematically examined the validity of the polygraph test among psychotic patients and compared the test results with psychiatric examinations.
Study sample
Inclusion criteria: Patients hospitalized in an open acute ward who met DSM-IV criteria for schizophrenia or schizoaffective disorder, and whose psychiatric disorder included delusions. All participants were examined by a senior psychiatrist not involved in the study, to determine capacity to provide informed consent. The informed consent process included a demonstration of the polygraph procedure. Those who understood the visual demonstration of the polygraph process, and the fact that it had no relation to their current treatment were considered able to provide informed consent.

Of those approached, three patients did not agree to participate. Two of the patients who gave informed consent did not fully understand the specific study questions; and were disqualified.

Participants were men and women, ages 18-60 years old. Patients with legal guardians or under compulsory hospitalization and pregnant women were excluded from the study. All participants had consented to their current hospitalization and were questioned about their psychoses.

All patients were asked trivial true and false questions, to calibrate lie detection by the polygraph specialist. A senior psychiatrist, who was a co-investigator of the study, defined the content of the delusions of patients with active psychoses immediately prior to the examination. The delusional content was then refined into a yes/no question. For example; a patient that was admitted following a few days of aggressive behavior towards his family, and the conviction that God was guiding him., broke a window and stood on the window sill. In the polygraph examination he was asked: “Did you break the window because God told you to do it?” The answer was compared to his replies to trivial questions used previously for calibration. All participants had polygraph tests (double examination) to examine the credibility of the psychotic content of their beliefs.

Polygraph instrument
The LX4000 computer polygraph system (Lafayette Instrument Company, Lafayette, Indiana, USA) is recognized and used by the American Polygraph Association, and the Israeli Computerized Polygraph Association.

Evaluations performed
The polygraph examinations were deciphered using Polyscore Polygraph Software, validated by the American Polygraph Association, and using the manual method, that is acceptable in Israel and throughout the world.

Brief Psychiatric Rating Scale (BPRS)
The BPRS was used to assess the level of 18 symptom constructs such as hostility, suspiciousness, hallucinations, and grandiosity. It is based on the clinician's interview with the patient and observations of the patient's behavior over the previous 2-3 days. Scores range from 1 (not present) to 7 (extremely severe). The time necessary to complete the interview and scoring was approximately 20-30 minutes.

Polygraph exams were considered usable, or non-usable depending on the validation by trivial yes/no questions. The results of the valid tests were compared with the patient’s clinical state as evaluated using the BPRS.

Data Analysis
Mann-Whitney U tests were used to compare the positive (polygraph results found valid) and negative groups (polygraph results invalid) on the BPRS sub-categories.

Patients were assigned to the positive (valid) or negative (invalid) groups by analyzing their ability to tell the truth or to lie when requested to do so in the baseline examination. Reasons for invalid polygraph results were: patients did not cooperate, did not understand questions, or did not agree to lie. For each patient the amount of times he or she told the truth or lied (when required to do so) were summed up. Thus, individual cutoff points for what was considered valid or invalid were determined by the trivial true and false questions, used to calibrate lie detection.

Mann-Whitney U tests were then used to examine the difference between the two groups (valid and invalid polygraph test) on the BPRS subscales. We hypothesized that the invalid group would be higher on BPRS scales because the severity of their symptoms would render the polygraph inadmissible. The analysis revealed significant differences in 7 of the BPRS subcategories concerning: unusual thought content, uncooperativeness, suspiciousness, mannerisms, tension, conceptual disorganization, and anxiety. Table 1 shows the difference between the two groups on the BPRS subcategories.

Results
Twenty-three inpatients in an acute open ward at Sha’ar Menashe Mental Health Center, Israel participated in the study which was approved by the local Internal Review Board. All participants provided written informed consent for participation in the study.
after receiving a detailed explanation of study procedures. It was clearly explained to the participants that the examination was in no way related to their treatment, and was solely for research purposes. The patients, who chose to participate, did so voluntarily. Those who expressed lack of interest, or who were hesitant, were not recruited to the study. Study results revealed that most of the patients had no objection to using the polygraph. For about 25% of the patients the test results were inappropriate and the tests were disqualified. The reasons for disqualification generally resulted from mental states that did not allow for performance of the examination and included agitation, or lack of understanding of the questions. For patients that were able to take the polygraph test, results were in full accord with the results of the psychiatric examination. All patients were treated with antipsychotic medications. Antipsychotic Defined Daily Doses were above 0.7. Other medications included benzodiazepines, mood stabilizers and medications for physical ailments. Polygraph examination is patient specific, and for each patient an autonomic baseline was established and results were compared with the patient's own baseline. Thus it was established that pharmacotherapy did not influence the reliability of the polygraph tests.

All study participants were voluntarily hospitalized throughout the duration of the study. The legal status of hospitalizations that were prior to the hospitalization during which the study performed and which were referred to in the questions on the polygraph test were: civil compulsory admission-10, forensic involuntary admission-4, voluntary admission-8, not admitted-2. Diagnoses were: schizophrenia-17, schizoaffective disorder-4, bipolar affective disorder-3. When the patient's condition precluded understanding the polygraph question the test was considered unreliable. In addition, it was technically impossible to examine an agitated patient.

Seventeen out of twenty-three polygraph examinations were found to be usable. Of the six participants whose test proved unusable, two did not understand the questions, one was severely agitated, for the remaining three, questions concerning the psychotic content of their thoughts triggered their withdrawal from the study. The polygraph examination confirmed that the patients indeed believed the psychotic content of their delusions to be true. Our research findings confirmed that the patients believed in their delusions. Expert testimonies and examinations that were performed for study participants during prior compulsory hospitalizations were in accord with the polygraph examinations performed in the study during the current voluntary hospitalization.

Discussion

To date, systematic studies of polygraph testing among individuals with mental illness are lacking. Our study shows that it is feasible to use polygraph to confirm expert psychiatric testimony. The specialist must first consider whether or not the complaint in a specific case stems from the patient’s illness. Our findings revealed that when patients are asked about authentic illness-related content, i.e. delusions, they are indeed unshakable beliefs. In such cases the polygraph will find that the patients are telling the truth, even when asked about events that in fact did not occur, owing to illness-related beliefs concerning the credibility of the psychotic content of delusions. The polygraph test can thus be used to confirm or refute expert testimony concerning the content of illness-related delusions.

For patients with clear psychiatric status or with evidence of psychosis, severe thought disorders, disorientation, cognitive dysfunctions; it is more difficult to perform a polygraph exam. In such cases, the validity of the test declines, however the polygraph is then less relevant, because those patients are more easily diagnosed. In contrast, for patients who are otherwise organized, and the decision/ruling rests on the content of their beliefs – that is whether or not the beliefs are delusions, the value of the polygraph tests increases. As proven here, polygraph can be constructively utilized in these patients.

Preliminary data indicate that polygraph tests are valid in this population of patients with severe psychiatric illnesses. These results are preliminary but are indeed innovative and encouraging regarding the efficacy of polygraph testing among the mentally ill.

Acknowledgement(s)

The authors acknowledge the assistance of Rena Kurs in preparation of this manuscript.

References

3. The Polygraph and Lie Detection Committee to


Polygraph Questions

1. Did you impersonate a doctor and discharge patients because voices told you to?
2. Did you break the window because God told you to?
3. Do you think you have to obey State laws when you date girls?
4. Were the voices that you heard broadcasted from an outside source?
5. Did you smoke because the voices ordered you to do so?
6. Did you slash your wrists because Satan told you to?
7. Did you attack your husband because of your illness?
8. Did the side effects of your blood tests cause your eyes to roll and your tongue to droop?
9. Did you wander the streets because a little birdie told you to do so?
10. Did you break things because voices told you to?
11. Could you not cut your hand when you heard the devil order you to cut it?
12. Could you avoid stalking your neighbor even though you knew it was wrong?
13. Did you steal the car because you believed that the theft was part of an entrance test to the Israeli Security Agency?
14. While in a manic state, even though you know it is against the law, can you avoid driving way above the speed limit?
15. Were you able to avoid breaking things when you heard voices?
16. Did your condition tell you to threaten your neighbor even though you knew it was against the law?
17. Did you know that smoking in the room is forbidden?
18. Did you undergo a psychiatric evaluation because your brother interfered?
19. Were people trying to poison you?
20. Did you eat so much because you thought there were worms in your throat?
Illustrations

Illustration 1

Table 1: Differences in BPRS sub-categories by group.

<table>
<thead>
<tr>
<th>Content</th>
<th>Group</th>
<th>N</th>
<th>Mean rank</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>disorientation</td>
<td>positive</td>
<td>17</td>
<td>11.47</td>
<td>-0.82</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>excitement</td>
<td>positive</td>
<td>17</td>
<td>11.47</td>
<td>-0.70</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>blunted affect</td>
<td>positive</td>
<td>17</td>
<td>11.41</td>
<td>-0.72</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>13.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unusual thought content</td>
<td>positive</td>
<td>17</td>
<td>10.76</td>
<td>-1.50</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>15.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>uncooperativeness</td>
<td>positive</td>
<td>17</td>
<td>10.24</td>
<td>-2.22</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>17.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>motor retardation</td>
<td>positive</td>
<td>17</td>
<td>12.09</td>
<td>-0.11</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>11.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hallucinatory</td>
<td>positive</td>
<td>17</td>
<td>12.71</td>
<td>-0.99</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Status</td>
<td>Count</td>
<td>Mean</td>
<td>SD</td>
<td>t</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>Suspiciousness</td>
<td>positive</td>
<td>17</td>
<td>10.79</td>
<td>-1.45</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>15.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostility</td>
<td>positive</td>
<td>17</td>
<td>12.18</td>
<td>-0.23</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>11.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive</td>
<td>positive</td>
<td>17</td>
<td>11.38</td>
<td>-0.80</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>13.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grandiosity</td>
<td>positive</td>
<td>17</td>
<td>12.91</td>
<td>-1.28</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>9.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mannerisms</td>
<td>positive</td>
<td>17</td>
<td>10.65</td>
<td>-1.84</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>15.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tension</td>
<td>positive</td>
<td>17</td>
<td>10.29</td>
<td>-2.09</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>16.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guilt</td>
<td>positive</td>
<td>17</td>
<td>11.15</td>
<td>-1.25</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>14.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conceptual disorganization</td>
<td>positive</td>
<td>17</td>
<td>10.21</td>
<td>-2.18</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>negative</td>
<td>6</td>
<td>17.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>emotional withdrawal</td>
<td>17</td>
<td>11.12</td>
<td>-1.10</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>negative</td>
<td>6</td>
<td>14.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>anxiety</td>
<td>17</td>
<td>9.91</td>
<td>-2.53</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>positive</td>
<td>6</td>
<td>17.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>somatic</td>
<td>17</td>
<td>10.85</td>
<td>-1.48</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>negative</td>
<td>6</td>
<td>15.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>