ABSTRACT

Background: Many studies identified aggression/impulsivity personality traits and neurocognitive functions as the most promising endophenotypes of suicidal behaviour.

Objectives: The aim of this study is to compare levels of aggression/impulsivity and planning ability between a group of inpatient suicide attempters and healthy control group.

Methods: We recruited a sample of 47 subjects, aged from 20 to 71 years, divided into two subgroups: 27 suicide attempters, 20 nonattempters. Levels of aggression, impulsivity and planning ability were assessed using State-Trait Anxiety Inventory-2 (STAI-2), Barratt Impulsivity Scale-11 (BIS-11) and Tower of London test (ToL).

Results: Differences between groups were examined through crossstabilities, t-tests for continuous variables and chi-squared tests for categorical variables.

Conclusions: These preliminary findings highlight that suicide attempters exhibit statistically significant differences in aggression personality traits and planning ability compared to nonattempters.

INTRODUCTION

It is well known in literature that the contribution of genetic factors in heritability of suicide risk is around 21-50% and is independent from heredity of risk suicide associated to mental disorders such as affective disorders, schizophrenia or alcohol dependence. Obviously, a single gene cannot explain the complex behaviour that is suicide. Given suicidal behaviour’s hereditary complexity and heterogeneity, to find demonstrable intermediate phenotypes (endophenotypes), which can help clinicians to estimate more accurately the risk of suicide, seems to be necessary.

According to the model proposed by Gottesman and Gould, an endophenotype is an internal phenotype which is produced by the expression of certain genes and has measurable characteristics; thus, it can be analyzed through neuropsychological, neuroanatomical or cognitive measures. Moreover, an endophenotype a) is heritable; b) must be associated with illness in the population; c) is a stable trait marker, thus it must be state independent; d) co-segregates within families with illness and should be observed in unaffected family members at a higher frequency than in the general population.

Different authors have already proposed a set of candidate endophenotypes of suicidal behaviour, of which the most promising are linked to: neuropsychological functioning (decision-making, executive functions), personality traits (impulsivity, aggressiveness, and neuroticism), neuroimaging, neuropsychology (as revealed by amygdala fMRI or prefrontal cortex metabolism PET).

In this study we want to explore certain neuropsychological aspects, that are levels of aggression/impulsivity and planning ability, comparing a group of inpatients, hospitalized in our psychiatric ward after an unsuccessful suicide attempt, and a healthy control group.

METHODS

Subjects

We recruited a sample of 47 voluntary subjects, aged from 20 to 71 years, divided into two subgroups: 27 suicide attempters and 20 nonattempters healthy controls. Detailed socio-demographic statistics of the sample are presented in Table 1.

Assessment

All participants were asked to complete two self-report questionnaires in their spare time and were invited to submit to the Planning ability test administered by psychologist.

Levels of aggression were assessed using State-Trait Anxiety Inventory-2 (STAI-2, Spielberger, 1999) which measures the experience, expression and control of anger.

It consists of a 31-items questionnaire which discriminate two components of Anger: State-Anger and Trait-Anger. State-Anger represents the emotional component which occurs in a specific situation and may change within a subject according to different situations. Furthermore, STAI-II can differentiate three tendencies in the handling of angry feelings: The tendency to introvert anger (Anger Expression-In), to frankly express or show feelings of anger (Anger Expression-Out), to control angry feelings and suppress them by calming down or cooling off (Anger Control to In and Out). Answers to items are indicated on a 4-point scale, from 1 (completely disagree) to 4 (completely agree).

The questionnaire provides for six subscales that we considered average when included from 25 to 75%, low when under 25%, high when included from 76 to 90% and very high when over 90%. Moreover, an Anger Expression Index can be calculated, which is an overall measure of total anger expression. Levels of impulsivity were assessed using Barratt Impulsivity Scale-11 (BIS-11; Patton et al., 1995), a questionnaire composed of 30 items, scored in a range from 30 to 150. Items are scored from 1 (Never = 1) to 5 (Always = 5) with the different desirability of scores. The normative range of total score, for Italian not clinic population, is between 54 and 74. Scores higher than 74 are considered clinically significant.

Finally, planning ability was assessed using Tower of London test (ToL, Shallice, 1982). It is administered through a tablet with three poles, different for height, on which can be stacked three differently coloured balls, according to different configurations. ToL measures the ability to plan, that is to prepare a procedure in order to achieve a goal. The subject examined is asked to move the spheres across the poles, with a limited number of moves, in order to obtain a certain configuration-goal, which is shown on a sheet of paper. The subject has to: formulate a master plan, identify undergoals and organize them within a sequence of movements, conserve undergoals and master plan in the working memory. The configurations proposed are characterized by an increasing complexity.

Figure 1: Statistically significant mean differences between groups according to STAI-2 scores.

Table 1: socio-demographic characteristics of the sample.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Attempters</th>
<th>Nonattempters</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>34.6 ± 9.1</td>
<td>39.5 ± 11.2</td>
<td>0.12</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>20/7</td>
<td>18/2</td>
<td>0.51</td>
</tr>
<tr>
<td>Education level</td>
<td>12.4 ± 2.8</td>
<td>13.6 ± 2.5</td>
<td>0.09</td>
</tr>
</tbody>
</table>

RESULTS

For what concerns STAI-2, inpatients suicide attempters, compared to healthy control nonattempters, exhibited higher scores at State Anger and Trait Anger subscales and lower scores at the Anger Control-Out subscale. However, no significant differences were found between groups according to BIS-11. Finally, in ToL, a longer initiation time and a higher number of total excess moves and rule violations were achieved by suicide attempters compared to nonattempters. Instead, no significant differences were found between groups based on the number of trials solved.

CONCLUSIONS

These preliminary findings highlight that suicide attempters exhibit statistically significant differences in aggression personality traits and planning ability compared to nonattempters. These results seem to be consistent with literature on neuropsychological endophenotypes in suicide behaviour; however, several limitations can be recognized within this study.

First of all, because of the small sample size, our findings should be interpreted cautiously. Further studies should consider larger samples and include both adolescents and very old people. Moreover, in the current study, data were collected based on self-report questionnaires, therefore they could be biased by different kinds of response style, for instance, exaggeration, minimization, malinger, and especially social desirability.