

BRIEF COMMUNICATION

Is introversion a risk factor for suicidal behaviour in depression?

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ABSTRACT

Background. Personality is an important determinant of suicidal behaviour. However, it has been studied little in relation to suicidal behaviour in depression.

Methods. Depressed patients who had attempted suicide ($N = 41$) were compared with depressed patients who had never attempted suicide ($N = 56$) and normal controls ($N = 56$) for their scores on three personality questionnaires.

Results. Introversion was the only personality dimension where the *post hoc* test showed a different pattern between the two groups of depressed patients in their relation to controls. In particular, only depressed patients who had attempted suicide had significantly lower introversion scores than controls.

Conclusion. The personality dimension of introversion may be a risk factor for suicidal behaviour in depression.

INTRODUCTION

Suicidal behaviour among depressed patients is a major problem. For example, between 25% and 40% of depressed patients attempt suicide at some time (Jamison & Goodwin, 1990). Follow-up studies of cohorts of depressed patients show that up to 15% end their lives by committing suicide (Jamison & Goodwin, 1990). A depressed patient who attempts suicide has an increased risk of eventually committing suicide (Nordstrom *et al.* 1995*a*). Thus, clinical studies of the characteristics of depressed patients who attempt suicide are of particular interest.

Personality is an important determinant of suicidal behaviour (Weissman *et al.* 1973; Nordstrom *et al.* 1995*b*). However, personality has been little studied as a determinant of suicidal behaviour among depressed patients. Thus, it was decided to test the hypothesis that depressed patients who attempt suicide would

show significant differences on personality scores when compared with depressed patients who do not attempt suicide and with normal controls.

METHOD

Ninety-seven depressed patients who met DSM-III-R criteria for a unipolar major depressive episode were studied. Forty-one of the patients (32 women and 9 men) had a lifetime history of an attempt at suicide and 56 had never attempted suicide (44 women and 12 men). The mean age of patients who had attempted was 35.6 ± 12.5 years and their mean 21-item Hamilton Depression Rating Scale (HDRS) (Hamilton, 1960) score 21.6 ± 7.1 compared with 37.7 ± 14.2 years and 18.5 ± 6.7 in the never attempted patients (NS). A group of 56 normal controls (28 women and 28 men) with a mean age of 36.2 ± 11.1 years was also studied. Controls were obtained through the normal volunteer office at the National Institutes of Health (NIH), Bethesda, MD and from the University of Medicine and Dentistry of New Jersey, New Jersey Medical School. Controls were interviewed using the Schedule for Affective Disorders and Schizo-

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Table 1. Depressed patients who had or had not attempted suicide and normal controls compared on personality variables[‡]

	Depressed patients who had attempted suicide N = 41	Depressed patients who had never attempted suicide N = 56	Normal controls N = 56
Eysenck scale	N = 41	N = 55	N = 55
Psychoticism score	3.8 ± 2.2	4.3 ± 4.0	3.0 ± 2.1
Extraversion/Introversion score	10.0 ± 5.6	11.8 ± 5.2	13.6 ± 4.4*
Neuroticism score	15.2 ± 6.2	16.0 ± 5.3	5.4 ± 4.2†
Lie score	10.1 ± 4.4	8.1 ± 4.2	8.5 ± 4.5
Other scales			
Hysteroid/Obsessoid Questionnaire (HOQ)	21.6 ± 7.3 N = 19	23.5 ± 7.7 N = 19	26.0 ± 4.4* N = 42
Hostility score	21.2 ± 9.8 N = 40	20.8 ± 8.7 N = 55	9.8 ± 4.5† N = 53

* ANOVAs showed significant differences between the three groups for introversion ($P < 0.003$) and HOQ scores ($P < 0.03$) and *post hoc* analysis showed that patients who had attempted suicide had significantly lower introversion and HOQ scores than controls.

† ANOVAs showed significant differences between the three groups for neuroticism ($P < 0.001$) and hostility ($P < 0.0001$). However, *post hoc* analyses showed that both groups of depressed groups had higher neuroticism and hostility scores than controls.

‡ Values shown in table are means ± s.d.

phrenia (Endicott & Spitzer, 1979) to exclude those with past or current psychiatric disorders, or suicide attempts, and also without a family history of psychiatric disorder.

Subjects were asked to complete three personality questionnaires: the Eysenck Personality Questionnaire (EPQ) (Eysenck & Eysenck, 1975), which measures extraversion/introversion, psychoticism, neuroticism, and lie scores; the Hostility and Direction of Hostility Questionnaire (HDHQ) (Foulds, 1965) which yields a total hostility score; and the Hysteroid/Obsessoid Questionnaire (HOQ) (Caine & Hawkins, 1963) which measures hysteroid and obsessoid traits. HOQ scores show a high correlation with extraversion/introversion scores (Caine & Hawkins, 1963). Patients were asked to complete the questionnaires with the instructions to answer '...as they were and felt before the depression', as shown to be a method to prevent distortion due to depression (Kendell & DiScipio, 1968). The data of 39 of the 97 patients and 42 of the 56 controls were previously reported in a study comparing depressed patients and controls for personality (Roy, 1990), but suicidal behaviour was not examined. All subjects signed informed consent.

In the statistical analysis, analysis of variance (ANOVA) was used. In the *post hoc* analyses Tukey's test was used, set at the $P < 0.05$ level of significance.

RESULTS

On the EPQ, ANOVA showed significant differences between the three groups for extraversion/introversion ($F = 6.05$, $df = 2$, 148, $P < 0.003$) and neuroticism ($F = 68.64$, $df = 2$, 148, $P < 0.0001$) but not for psychoticism ($F = 2.89$, $df = 2$, 148, NS) or lie scores ($F = 2.71$, $df = 2$, 148, NS). In the *post hoc* analysis only patients who had attempted suicide had significantly lower extraversion/introversion scores than controls (Table 1). Both depressed patients who had or had not attempted suicide had significantly higher neuroticism scores than controls.

On the Hysteroid/Obsessoid Questionnaire (HOQ), ANOVA showed a significant difference between the three groups ($F = 3.58$, $df = 2$, 77, $P < 0.03$). In the *post hoc* analysis only patients who had attempted suicide had significantly lower HOQ scores than controls (Table 1).

On the Fould's hostility scale, ANOVA showed a significant difference between the three groups ($F = 34.57$, $df = 2$, 145, $P < 0.0001$). *Post hoc* analysis showed that both depressed patients who had or had not attempted suicide had significantly higher hostility scores than controls (Table 1).

When only the large subgroups of women subjects were examined, similar differences were found for extraversion-introversion ($F = 4.76$, $df = 2$, $P < 0.01$), neuroticism ($F = 43.2$, $df = 2$,

99, $P < 0.0001$), hostility ($F = 23.4$, $df = 2$, 99, $P < 0.0001$), and HOQ scores ($F = 2.32$, $df = 2$, 50, $P < 0.1$). In the *post hoc* analysis only depressed women who had attempted suicide ($N = 32$) had significantly lower introversion scores than women controls ($N = 27$) (mean 10.5 ± 6.0 v. 14.6 ± 4.1 , $P < 0.05$). The *post hoc* analyses for neuroticism and hostility in women subjects showed the same pattern of results as for the total groups.

Twenty of the depressed patients completed the EPQ on a second occasion when in remission and euthymic, and there was not significant difference for introversion scores (mean 10.9 ± 5.1 v. 10.9 ± 3.9 , NS).

DISCUSSION

There were two personality scores – introversion and hysteroid/obsessoid (HOQ) scores – where there was a different pattern between depressed patients who had or had not attempted suicide in their relation to controls. Specifically, only depressed patients who had attempted suicide at some time had significantly lower introversion and HOQ scores than controls.

Interestingly, though little studied in depressed attempters, studies of suicide attempters (parasuicide) have reported that attempters are ‘introverted rather than extraverted’ (Philip, 1970; Pallis & Birtchnell, 1975; Mehryar *et al.* 1977; Pallis & Jenkins, 1977; Infani, 1978; Roy, 1978; Banki & Arato, 1983). For example, Colson (1978) reported that suicide attempters had significantly greater introversion scores on the Maudsley Personality Inventory (MPI). On the HOQ, Vinoda (1966) and Eastwood *et al.* (1972) found that suicide attempters ‘scored towards the obsessoid end of the continuum, which implies that they contain their feelings in an introverted fashion’. Both Goldney (1981) and Murthy (1969) found that suicide attempters had lower HOQ scores than controls, as found in the depressed attempters in the present study.

The introversion findings of this cross-sectional study are consistent with results from longitudinal studies of eventual suicides. For example, Paffenbarger & Asnes (1966) found that, at college admission, significantly more of the 225 eventual suicides among 40000 students rated themselves as seclusive and secretive. During college, significantly fewer of the suicide

students were extracurricular activity joiners. This non-participation was seen as ‘consistent with classical hypotheses that associate suicidal tendency with lack of sociability’. Thomas (1971) reported that two of six questions that discriminated eventual suicides among John Hopkins medical students were ‘an urge to be by oneself and get away from it all’ and lack of ‘an urge to confide and seek advice and reassurance’. Thomas similarly concluded that her results ‘fit with Durkheim’s emphasis on the inverse relationship between social interaction and the suicide rate’. More recently Fawcett *et al.* (1987), in depressed patients, found that ‘fewer friendships during adolescence’ distinguished depressed patients who suicided and Caspi *et al.* (1996) reported that children classified as inhibited at 3 years of age were more likely at 21 years to have major depression and to have attempted suicide.

Studies using the Maudsley Personality Inventory (MPI) have reported that unipolar depressed patients have lower introversion scores (‘state’ effect) and that episodes of major depression also lower introversion (‘scar’ effect) (Akiskal *et al.* 1983; Shea *et al.* 1996). However, using the EPQ – which has differences in scale content from the MPI – Kendler *et al.* (1993) recently showed that ‘neither the state of being depressed nor the scar of previous episodes of MD significantly altered levels of E’. In the present EPQ study, consistent with Kendler *et al.*’s finding of a lack of ‘state’ effect on EPQ introversion scores, is the fact that 20 of these depressed patients completed the EPQ on a second occasion when in remission and euthymic, and there was no significant difference for introversion scores. It is also noteworthy that both groups of patients had similar mean HDRS scores and were instructed to complete the EPQ as they were before the depression to minimize any effect of current state (Kendell & DiScipio, 1968).

Other results were that both depressed patients who had, or had not, attempted suicide had higher neuroticism and hostility scores than controls. However *post hoc* analyses showed that there were no significant differences on these variables between patients who had, or had not, attempted suicide. Thus, the results for neuroticism and hostility are likely to be related to the risk for major depression itself (Kendler *et*

al. 1993; Clayton *et al.* 1994; Lauer *et al.* 1997) and not related specifically to the suicidal behaviour. The fact that the difference between the two depressed groups for introversion scores did not reach statistical significance may reflect that a larger sample is needed.

In summary, this report suggests that introversion may predispose depressed patients to attempt suicide. Other studies have reported that depressed patients who attempt suicide are impulsive/aggressive (Paykel & Dienelt, 1971; Angst & Clayton, 1986; Joffe & Regan, 1989; Malone *et al.* 1995; Corruble *et al.* 1996). Some studies report both introversion and impulsivity/aggression (Allebeck *et al.* 1988; Shaffi *et al.* 1988; Brent *et al.* 1993, 1994). Recently, extraversion has been shown to predict levels of social support (Furukawa & Shibayama, 1997; Kendler, 1997). Thus, introversion – and associated low levels of social support – might lower the threshold for impulsive, and other, attempts when depressed. Further studies, using the more reliable interview methods to assess personality, are needed.

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REFERENCES

- Akiskal, H., Hirsch, R. & Yerevanian, B. (1983). The relationship of personality and affective disorders. *Archives of General Psychiatry* **40**, 801–810.
- Allebeck, P., Allgulander, C. & Fisher, L. (1988). Predictors of completed suicide in a cohort of 50,465 young men: role of personality and deviant behaviour. *British Medical Journal* **297**, 176–178.
- Angst, J. & Clayton, P. (1986). Premorbid personality of depressive, bipolar, and schizophrenic patients with special reference to suicidal issues. *Comprehensive Psychiatry* **27**, 511–532.
- Banki, C. & Arato, M. (1983). Amine metabolites, neuroendocrine findings and personality dimensions as correlates of suicidal behavior. *Psychiatry Research* **10**, 253–251.
- Brent, D., Johnson, B., Bartle, S., Bridge, J., Rather, C., Matta, J. & Constantine, D. (1993). Personality disorder, tendency to impulsive violence, and suicidal behavior in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* **32**, 69–75.
- Brent, D., Johnson, B., Perper, J., Connolly, J., Bridge, J., Barle, S. & Rather, C. (1994). Personality disorder, personality traits, impulsive violence and completed suicide in adolescents. *Journal of the American Academy of Child Adolescent Psychiatry*, **33**, 1080–1086.
- Caine, T. & Hawkins, L. (1963). A questionnaire measure of the hysteroid/obsessoid component of personality – the HOQ. *Journal of Consulting Psychology* **27**, 206–209.
- Caspi, A., Moffitt, T., Newman, D. & Silva, P. (1996). Behavioral observations at age three years predict adult psychiatric disorders. *Archives of General Psychiatry* **53**, 1033–1039.
- Clayton, P., Ernst, C. & Angst, J. (1994). Pre-morbid personality traits of men who develop unipolar or bipolar disorders. *European Archives of Psychiatry and Clinical Neuroscience* **243**, 340–346.
- Colson, C. (1978). Neuroticism, extraversion and repression-sensitization in suicidal college students. *British Journal of Social and Clinical Psychology* **11**, 88–89.
- Corruble, E., Duret, C., Gourevitch, R., Payan, C. & Guelfi, J. (1996). Impulsivity in a sample of depressed patients with or without suicide attempts. *European Journal of Psychiatry* **11**, S327–S328.
- Eastwood, R., Henderson, A. & Montgomery, I. (1972). Personality and parasuicide: methodological problems. *Medical Journal of Australia* **1**, 170–175.
- Endicott, J. & Spitzer, R. (1979). A diagnostic interview: the schedule for affective disorders and schizophrenia. *Archives of General Psychiatry* **35**, 837–844.
- Eysenck, H. & Eysenck, S. (1975). *Manual of the Eysenck Personality Questionnaire*. Hodder and Stoughton: London.
- Fawcett, J., Scheftner, W., Clark, D., Hedeker, D., Gibbons, R. & Coryell, W. (1987). Clinical predictors of suicide in patients with major affective disorders: a controlled prospective study. *American Journal of Psychiatry* **144**, 35–40.
- Foulds, G. (1965). *Personality and Personal Illness*. Tavistock: London.
- Furukawa, T. & Shibayama, T. (1997). Intra-individual versus extra-individual components of social support. *Psychological Medicine* **27**, 1183–1191.
- Goldney, R. (1981). Are young women who attempt suicide hysterical? *British Journal of Psychiatry* **138**, 141–146.
- Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry* **23**, 56–62.
- Infani, S. (1978). Personality correlates of suicidal tendency among Iranian and Turkish students. *Journal of Psychology* **99**, 151–153.
- Jamison, K. & Goodwin, F. (1990). Suicide in manic-depressive illness. In *Manic-Depressive Illness* (ed. K. Jamison and F. Goodwin), pp. 227–244.
- Joffe, R. & Regan, J. (1989). Personality and suicidal behavior in depressed patients. *Comprehensive Psychiatry* **30**, 157–160.
- Kendler, R. (1997). Social support: a genetic-epidemiologic analysis. *American Journal of Psychiatry* **154**, 1398–1404.
- Kendler, K., Neale, M., Kessler, R., Heath, A. & Eaves, L. (1993). A longitudinal twin study of personality and major depression in women. *Archives of General Psychiatry* **50**, 853–862.
- Kendell, R. & DiScipio, W. (1968). Eysenck Personality Inventory scores of patients with depressive illness. *British Journal of Psychiatry* **114**, 767–770.
- Lauer, C., Bronisch, T., Kainz, M., Schreiber, W., Hobsboer, F. & Krieg, J. (1997). Pre-morbid psychometric profile of subjects at high familial risk for affective disorder. *Psychological Medicine* **27**, 355–362.
- Malone, K., Haas, G., Sweeney, J. & Mann, J. (1995). Major depression and the risk of attempted suicide. *Journal of Affective Disorders* **34**, 173–185.
- Mehryar, A., Hekmat, H. & Khajavi, F. (1977). Some personality correlates of contemplated suicide. *Psychological Reports* **40**, 1291–1294.
- Murthy, V. (1969). Personality and the nature of suicidal attempts. *British Journal of Psychiatry* **115**, 791–795.
- Nordstrom, P., Åsberg, M., Åberg-Wistedt, A. & Nordin, C. (1995a). Attempted suicide predicts suicide risk in mood disorders. *Acta Psychiatrica Scandinavica* **92**, 345–350.
- Nordstrom, P., Schalling, D. & Åsberg, M. (1995b). Temperamental vulnerability in attempted suicide. *Acta Psychiatrica Scandinavica* **92**, 155–160.
- Paffanbarger, R. & Asnes, A. (1966). Chronic disease in former college students. III. Precursors of suicide in early and middle life. *American Journal of Public Health* **56**, 1026–1036.
- Pallis, D. & Birchnell, J. (1975). Personality and suicidal history in psychiatric patients. *Journal of Clinical Psychology* **32**, 246–253.
- Pallis, D. & Jenkins, S. (1997). Extraversion, neuroticism and intent in attempted suicides. *Psychological Reports* **41**, 19–22.

- Paykel, E. & Dienes, M. (1971). Suicide attempts following acute depression. *Journal of Nervous and Mental Disorders* **153**, 234–243.
- Philip, A. (1970). Traits, attitudes and symptoms in a group of attempted suicides. *British Journal of Psychiatry* **116**, 475–482.
- Roy, A. (1978). Self-mutilation. *British Journal of Medical Psychology* **51**, 201–203.
- Roy, A. (1990). Personality variables in depressed patients and normal controls. *Neuropsychobiology* **23**, 119–123.
- Shafiq, M., Carrigan, S., Whittinghill, J. & Derrick, A. (1988). Psychological autopsy of completed suicide in children and adolescents. *American Journal of Psychiatry* **142**, 1061–1064.
- Shea, T., Leon, A., Mueller, T., Solomon, D., Warshaw, N. & Keller, M. (1996). Does major depression result in lasting personality change? *American Journal of Psychiatry* **153**, 1401–1410.
- Thomas, C. (1971). Suicide among us: habits of nervous tension of potential predictors. *Bulletin of Johns Hopkins Hospital* **129**, 190–201.
- Vinoda, K. (1966). Personality characteristics of attempted suicide. *British Journal of Psychiatry* **112**, 1143–1150.
- Weissman, M., Fox, K. & Klerman, G. (1973). Hostility and depression associated with suicide attempts. *American Journal of Psychiatry* **130**, 450–454.