

A study of premorbid personality and behavioural and psychological symptoms of dementia in nursing home residents

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SUMMARY

Objective To investigate the relationship between pre-morbid personality and behavioural and psychological symptoms of dementia (BPSD).

Methods We studied 58 subjects with dementia and depression and/or psychosis residing in 11 Sydney nursing homes cross-sectionally. Informal caregivers completed ratings of residents' pre-morbid personality on the NEP Five-Factor Inventory (NEO-FFI). Information on BPSD was obtained using the BEHAVE-AD.

Results Higher neuroticism was predictive of delusions; higher agreeableness of hallucinations, aggressiveness, affective disturbance and overall behavioural disturbance; and higher openness of affective disorder.

Conclusion Our findings are inconsistent with previous research and clinical experience. Prospective studies are needed to clarify the association between personality and behavioural disturbance in dementia. Copyright © 2002 John Wiley & Sons, Ltd.

KEY WORDS — dementia; depression; psychosis; personality

INTRODUCTION

Behavioural and psychological symptoms of dementia (BPSD), including hallucinations, delusions, aggression, activity disturbance and depression, contribute significantly to caregiver burden (Coen *et al.*, 1997; Teri, 1997; Clyburn *et al.*, 2000) and are a major reason for institutionalization (Bianchetti *et al.*, 1995; Lopez *et al.*, 1999). The prevalence of BPSD in nursing homes has been reported to range from 43% to 93% in the United States (Beck and

Shue, 1994) and 29% to 92% in Australia (Snowdon *et al.*, 1996; Brodaty *et al.*, 2001).

It has been suggested that BPSD reflect an individual's premorbid personality traits (Kolanowski and Whall, 1996). Previously reported associations between personality traits and BPSD in both community and nursing home samples include higher premorbid neuroticism with increased depression and dysphoria, severity of anxiety and troublesome behaviour; lower premorbid extraversion and frustration tolerance with increased depression; higher premorbid hostility with delusions; and higher openness with hallucinations (Chatterjee *et al.*, 1992; Strauss *et al.*, 1997; Meins *et al.*, 1998). Other studies have failed to demonstrate links between premorbid personality and BPSD (Swearer *et al.*, 1996; Brandt *et al.*, 1998).

We aimed to investigate the relationship between premorbid personality and BPSD in a nursing home in order to clarify the lack of replicated findings to date.

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METHODS

A convenience sample was recruited during the screening process for a randomized-controlled study of treatment of depression and psychosis in dementia in 11 nursing homes in eastern Sydney. The 225 informal caregivers of residents who screened positive for cognitive impairment as well as depression and/or psychosis were approached to participate if they visited the resident at least weekly. 58 agreed to complete questionnaires about themselves and the residents. Approvals were obtained from Institutional Ethics Committees and participating nursing homes.

Consent was obtained based on published guidelines (Cohen-Mansfield *et al.*, 1988). Details have been published (Draper *et al.*, 2001). Residents screened positive for cognitive impairment if they scored ≤ 7 on the Abbreviated Mental Test Scale (AMTS; Hodkinson, 1972), positive for depression and/or psychosis if they reached predetermined cut-offs on at least two depression measures (including the Even Briefer Assessment Scale for Depression, Hamilton Depression Rating Scale, Cornell Scale for Depression in Dementia and Geriatric Depression Scale) or two psychosis measures (including the Behavioral Pathology in Alzheimer's Disease Rating Scale, Neuropsychiatric Inventory and Scale for the Assessment of Positive Symptoms; Brodaty *et al.*, in press).

Instruments

1. Informal caregivers completed the NEO Five Factor Inventory (NEO-FFI; Costa and McCrae, 1988) describing the resident's pre-morbid personality. The NEO-FFI is a validated standardized instrument designed for either self- or informant-report (McCrae and Costa, 1987; Costa and McCrae, 1988; Strauss and Pasupathi, 1994) that has been used in previous retrospective studies of personality (Kolanowski and Garr, 1999). The NEO-FFI assesses five major domains of personality: neuroticism, extraversion, openness, agreeableness and conscientiousness. Neuroticism is the general tendency to experience negative affect (e.g. fear, sadness, anger). Extraversion is the tendency to like people and to be assertive, active and talkative. Openness to experience involves a curiosity about inner and outer worlds. Agreeableness is a tendency to be sympathetic to others and eager to help. Conscientiousness is the ability to plan, organize and carry out tasks.
2. The Resident Classification Index (RCI; Department of Health, Housing and Community Services, 1992), a 14-item scale designed to determine the level of nursing care required and therefore the amount of Australian government funding for nursing home residents, was used to measure the general functioning and needs of the subject. It has four sub-scales, each rated on a 4-point scale—clinical care, social and emotional support, communication and sensory processes, and activities of daily living. Scores are weighted and summed according to a published formula to yield five categories of dependency from 5 = the least to 1 = the most dependent (RCI; Department of Health, Housing and Community Services, 1992).
3. Cognitive status was assessed in consenting residents with the Abbreviated Mental Test Scale (AMTS; Hodkinson, 1972), a ten item cognitive screening test administered by a researcher. Scores ≤ 7 indicate significant cognitive impairment.
4. The Functional Assessment Staging Tool (FAST; Reisberg, 1988) is a seven-stage scale measuring dependency rated by research staff. Stages 6 and 7 are further subdivided into substages, a–e, scored as 6.2, 6.4, 6.6, etc. (Reisberg and Ferris, 2000).
5. The BEHAVE-AD (Reisberg *et al.*, 1987) is a 26 item observer rating scale containing seven sub-scales, each rated 0–3: (a) paranoid and delusional ideation; (b) hallucinations; (c) activity disturbances; (d) aggressiveness; (e) diurnal rhythm disturbance; (f) affective disturbance; and (g) anxiety and phobias. Items 2 ('one's house is not one's home') and 4 ('delusion of abandonment') in the paranoid and delusional ideation subscale were not included in the present analyses as affirmation of these items was often true. Items were rated for each subject over the last two weeks by morning and evening shift nursing staff separately and the mean score used for analyses.

STATISTICS

All analyses were performed with SPSS version 10.0 (SPSS Inc, 2000). Scores from the NEO-FFI were converted to gender appropriate *t*-scores according to a published protocol (Costa and McCrae, 1991). Multiple regression analyses investigated predictors of BPSD with BEHAVE-AD delusions, hallucinations, activity disturbance, aggression and depression subscales and total score as dependent variables. In all regression analyses, AMTS, RCI score and resident age were first entered into the regression equation as they were previously shown to be associated with BPSD (Brodaty *et al.*, 2001). The five NEO-FFI factors were then entered using stepwise selection

criteria. The *p*-value for significance after Bonferroni corrections for multiple comparisons between residents for whom we did or did not obtain pre-morbid personality ratings was set at 0.01. The *p*-value for significance after Bonferroni corrections for six multiple regressions is 0.008.

RESULTS

Completed retrospective NEO-FFI scales were returned for 58 residents (25.8% returned). Of these one did not meet DSM-IV criteria for dementia and was excluded from these analyses. Of the 57 remaining residents, 42 (73.7%) were female. Other descriptive data including NEO-FFI factor scores are presented in Table 1. All patients had AMTS scores ≤ 7 . Overall residents in this study were described as being average in neuroticism and extraversion, low in openness and conscientiousness and very low in agreeableness.

Residents for whom we obtained completed NEO-FFI questionnaires were similar to residents for whom they were not returned as regards age, cognitive impairment as measured by the AMTS, gender, functional impairment measured by RCI score and behavioural disturbance as measured by total BEHAVE-AD score ($t = -0.391$, $df = 223$, $p = 0.696$; $t = -0.412$, $df = 223$, $p = 0.680$; $\chi^2 = 0.320$, $df = 224$, $p = 0.572$; $t = -0.313$, $df = 216$, $p = 0.762$; $t = -1.030$, $df = 223$, $p = 0.304$ respectively).

The mean age of caregivers was 61.4 (± 11.6) years (range 34–84). Thirty one (54.4%) were female; five (8.8%) were siblings of the resident, nine (15.8%) were spouses, 36 (63.2%) were children, and seven (12.3%) were friends or other relatives of the resident.

Table 1. Characteristics of resident sample

Variable (Potential range)	Mean (sd)	Range of scores
Age	82.9 (7.8)	49–95
AMTS ^a total (0–10)	3.32 (2.27)	0–7
EBAS-DEP ^b (0–8)	3.33 (2.61)	0–8
BEHAVE-AD ^c (0–78)*	11.76 (8.93)	0–39
FAST ^d score (1–7.8)	6.50 (0.53)	4–7.4
RCI ^e weighted total (0–104.29)*	57.12 (19.01)	9–86
RCI ^e category (1–5)*	3.09 (0.82)	2–5
NEO-FFI Neuroticism (25–75)	52.98 (7.93)	39–72
NEO-FFI Extraversion (25–75)	48.18 (7.95)	29–74
NEO-FFI Openness (25–75)*	44.13 (6.38)	31–57
NEO-FFI Agreeableness (25–75)	32.84 (11.13)	25–56
NEO-FFI Conscientiousness (25–75)	38.89 (6.13)	25–52

^aAbbreviated Mental Test Score; ^bEven Briefer Assessment Scale for Depression; ^cBehavioural disturbance in Alzheimer's Disease; ^dFunctional Assessment Staging; ^eResident Classification Index. *data for one or two subjects missing for these scales.

Seven (12.3%) caregivers rated their relationship with the resident before institutionalization as somewhat close, 10 (17.5%) as moderately close and 40 (70.2%) as very close. Twenty (35.1%) caregivers were residing with the resident before institutionalization.

Results of the multiple regressions with BEHAVE-AD subscales as the dependent variables are presented in Table 2. Delusional ideation was predicted by a higher pre-morbid neuroticism score, hallucinations, aggressiveness and total BEHAVE-AD by higher agreeableness and affective disturbance by higher pre-morbid openness and agreeableness, though after Bonferroni correction for multiple comparisons the only significant association is between agreeableness and affective disturbance.

Table 2. Beta coefficients (and significance) of multiple linear regressions^{a,b} ($n = 53$)

	Age	AMTS	RCI	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Delusions		-0.358 (0.013)		0.296 (0.026)				
Hallucinations		-0.435 (0.005)					0.267 (0.045)	
Activity Disturbance	-0.308 (0.018)	-0.430 (0.004)						
Aggressiveness			0.270 (0.048)				0.218 (0.019)	
Affective disturbance				0.422 (0.005)		0.314 (0.018)	0.383 (0.006)	
Total		-0.381 (0.007)					0.253 (0.043)	

^aOnly significant predictors at the 0.05 level reported.

^bAfter Bonferroni corrections for running six multiple regressions, *p* set at 0.008.

DISCUSSION

We found that higher neuroticism factor scores predicted higher delusion scores; higher agreeableness predicted greater levels of hallucinations, aggressiveness, affective disturbance and total BEHAVE-AD score; and higher openness predicted greater affective disturbance on the BEHAVE-AD. These findings are inconsistent with previous reports from community (Chatterjee *et al.*, 1992; Swearer *et al.*, 1996; Strauss *et al.*, 1997; Meins *et al.*, 1998) and nursing home samples (Brandt *et al.*, 1998; Kolanowski and Garr, 1999).

We attempted to minimise reporting biases by using a reliable retrospective informant rated instrument (Kolanowski and Garr, 1999) and by obtaining reports on premorbid personality and current behaviour or psychological status from different informants, all blind to the study hypotheses. Nevertheless the accuracy of informant reports are questionable since residents' scores, as reported, were low or very low on three out of the five personality factors.

Our findings that residents who were rated as having been more agreeable currently displayed more hallucinations, aggressiveness, affective disturbance and behavioural disturbance appear counter-intuitive, unless we hypothesise that caregivers of these more disturbed residents were more prone to idealise the resident's past personality. This seems unlikely. Alternatively there may be no relationship between premorbid personality and behaviors. It may be that a common pathophysiological process is part of the dementia and underpins the occurrence of BPSD (Minger *et al.*, 2000) e.g. the neuropathological changes described in the depression and psychosis of dementia (Zubenko *et al.*, 1991).

The relatively small sample size, use of a convenience sample, the inclusion of only cognitively impaired residents who were psychotic or depressed, the low rate of return of caregiver questionnaires (even though the caregiver rated and non-rated residents were similar demographically and clinically) may have lowered our chances of finding significant associations between BPSD and personality and limits the generalisability of our findings.

Our results are inconsistent with previously shown links between premorbid personality and BPSD and clinical experience. This may be due to sampling differences as most previous studies only included subjects with Alzheimer's dementia. True associations if any, would be best confirmed by community-based prospective studies documenting personality traits prior to the development of dementia and BPSD,

KEYPOINTS

- Previous studies have shown associations between premorbid behaviour and personality.
- We found that higher neuroticism was predictive of delusions; higher agreeableness of hallucinations, aggressiveness, affective disturbance and overall behavioural disturbance; and higher openness of affective disorder.
- These results are inconsistent with previous research and may not support a link between premorbid personality and BPSD.

characteristics of the dementia and BPSD development. If confirmed such findings could afford families great relief as they would no longer *blame* the person with dementia for the aberrant behavior but instead attribute behaviors such as aggression or irritability to the underlying disease process.

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