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Suicidal and death ideation in Parkinson's disease

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Abstract

Parkinson's disease (PD) is a chronic, disabling illness affecting primarily the elderly and is associated with a high prevalence of depression. Although these are known risk factors for suicidal and death ideation, little is known about the prevalence and correlates of such ideation in PD. A convenience sample of 116 outpatients with idiopathic PD at two movement disorders centers were administered a modified Paykel Scale for suicidal and death ideation, as well as an extensive psychiatric, neuropsychological, and neurological battery. Univariate and multivariate logistic regression models were used to determine the correlates of suicidal or death ideation. Current death ideation (28%) or suicide ideation (11%) were present in 30% of the sample, and 4% had a lifetime suicide attempt. On univariate logistic regression analysis, increasing severity of depression (odds ratio = 2.92, 95% CI 2.01-4.24, $P < 0.001$), impulse control disorder (ICD) behaviors sometime during PD (odds ratio = 6.08, 95% CI 1.90-19.49, $P = 0.002$), and psychosis (odds ratio = 2.45, 95% CI 1.05-5.69, $P = 0.04$) were associated with either ideation. On multivariate logistic regression analysis, only increasing severity of depressive symptoms (odds ratio = 2.76, 95% CI 1.88-4.07, $P < 0.001$) predicted suicidal or death ideation. In conclusion, active suicidal or death ideation occurs in up to one-third of PD patients. Comorbid psychiatric disorders, more than PD-related disease variables, are associated with this ideation, highlighting the need for a comprehensive approach to the clinical care of PD patients.

ARTICLE TEXT

Suicide is a major public health problem, ranking 11th among causes of death in the United States.[1] Modifiable risk factors for suicide include mood disorders (e.g., major depression),[2-8] substance abuse or alcoholism,[9][10] common chronic medical conditions (e.g., pain, congestive heart failure, and chronic obstructive pulmonary disease),[11][12] and lack of social ties,[5] while immutable risk factors include male sex and increasing age.[3][13][14] Suicide rates in the United States are highest among elderly, white males,[4-6][15][16] a public health problem that will grow with the aging of the population.

Suicide-related thoughts and behaviors may be categorized as suicide-related ideation, suicide attempts, and completed suicide.[17] Suicidal ideation is defined as thoughts about intentionally ending one's own life, whereas death ideation is the wish to die without intent to kill oneself.

The reported prevalence of suicide ideation in the elderly varies widely, from less than 1% to 17%.[5][18] In a population-based study involving elderly people with no diagnosable mental disorders, 4% felt that life was not worth living, 28% had death wishes, 9% had thought about taking their lives, and 2% had seriously considered suicide within 1 month of interview.[19] Similar to completed suicide, suicidal ideation in the elderly is also associated with depression;[19] in a study of ~1,000 elderly patients, it was reported that 50% of those who had frequent suicidal thoughts were also suffering from major depression.[20]

Demographic risk factors for Parkinson's disease (PD) include two suicide risk factors, increasing age[21] and male sex.[22][23] PD is often accompanied by one or more psychiatric or cognitive disorders, including depression, psychosis, and dementia.[24-27] The presence of a chronic, progressive and disabling disease, an older male population on average, and the frequent co-occurrence of psychiatric disorders together suggest that death ideation and suicide-related ideation and behaviors would be common in PD.

Although reviews of depression have concluded that suicide ideation is relatively common in PD,[28][29] there is little published research on this topic, and there is research suggesting that suicide itself is actually *less* common in PD than in the general population.[30][31] In two studies examining the psychometric properties of different depression rating scales in PD, one study found that 9% of *depressed* patients reported suicidal ideation,[32] while the other reported that 20% of *all* patients had suicidal ideation.[33] However, depression rating scales typically include only a single suicide ideation item, which also queries about death ideation, and these studies did not describe how the suicide items were scored. In a small study comparing major depression in patients with and without PD that used a semi-structured clinical interview, 75% of both groups endorsed suicidal ideation, but a history of suicide attempts was significantly more common in non-PD patients (42% vs. 4%, respectively).[34]

To our knowledge there is no published research reporting on the systematic evaluation of suicidal and death ideation in PD, including an examination of the association between such ideation and motor symptoms or nonmotor symptoms other than depression. We report data on the frequency and correlates of both types of ideation in a sample of PD patients receiving specialty care.

SUBJECTS AND METHODS

Subjects

Subjects (N = 116) were a convenience sample of patients with a diagnosis of possible or probable idiopathic PD,[\[35\]](#) confirmed by a movement disorders specialist, at the Parkinson's disease centers at the University of Pennsylvania (N = 85) or the Philadelphia Veterans Affairs Medical Center (N = 31). They were a subset of patients who were screened for depression during a routine clinical visit without regard for psychiatric status (N = 520). Subjects included in these analyses agreed to additionally participate in a more detailed psychiatric, neuropsychological, and neurological evaluation at a separate visit.

At screening, patients were administered the 15-item Geriatric Depression Scale[\[36\]](#) (GDS-15; range = 0-15, higher scores indicating greater severity of depression). The GDS-15 has been validated in PD,[\[37\]](#)[\[38\]](#) although it does not include an item querying about suicidal or death ideation. Within the screened population, there were no between-group differences in mean GDS-15 score for those who did and did not participate in the additional assessment process reported herein ($t = -1.6$, $df = 518$, $P = 0.12$). The group who completed the additional assessment process were younger on average than those who were screened only (64.7 [10.4] vs. 67.5 [10.9], respectively, $t = 2.5$, $df = 518$, $P = 0.01$), but there was no difference in sex distribution ($X^2 = 1.8$, $df = 1$, $P = 0.18$). Thus, the subset of patients reported on herein was representative of the larger convenience sample of clinic patients.

Procedures

General

The institutional review boards at the University of Pennsylvania and the Philadelphia VAMC approved the study, and only patients able to provide their own written informed consent were included. A geriatric psychiatrist (DW) with training in the administration of neurological assessments administered the UPDRS, and trained research staff administered the psychiatric and neuropsychological instruments.

Demographic and Clinical Characteristics

As part of the screening process, patients provided the following information during a semi-structured clinical interview: age, sex, race, marital status, years of education, duration of PD, history of deep brain stimulation (DBS) surgery, current "heavy" alcohol use (i.e., ≥ 14 drinks per week[\[39\]](#)), and history of any impulse control disorder (ICD)

behaviors (e.g., compulsive gambling, buying, sexual behavior, or eating) sometime during the course of PD, the latter being ascertained through questions previously used to screen for ICDs.[40]

Psychiatric Assessments

Suicidal and death ideation were assessed using a modified version of the Paykel Scale, a screening questionnaire consisting of five yes/no questions[41] that has been used in psychiatric research, including in the elderly.[42] The instrument was modified by having it self-administered and by querying about thoughts and behaviors *over the past month* (instead of the past year as in the original instrument) to assess active ideation and to make the time frame consistent with our other psychiatric assessments. Two items address death ideation (“Has there been a time in the last month when you felt life was not worth living?”, and “Has there been a time in the last month that you wished you were dead, for instance that you would go to sleep and not wake up?”), another two suicide ideation (“Has there been a time in the last month that you thought of taking your own life, even if you would not really do it?”, and “Has there been a time in the last month when you reached the point where you seriously considered taking your own life, or perhaps made plans how you would go about doing it?”), and one queries about lifetime suicide attempt (“Have you ever made an attempt on your life?”). A positive response to either of the two death ideation items or either of the two suicide ideation items was considered a positive response for that category overall.

Severity of depression was measured with the rater-administered version of the Inventory for Depressive Symptomatology[43] (IDS; range = 0-84 points, higher scores indicating greater severity of depression). Diagnosis of a depressive disorder was made using the depression module of the Structured Clinical Interview for DSM-IV (SCID).[44] Subjects were given a DSM-IV diagnosis of no depressive disorder, major depression, or nonmajor depression (the latter either dysthymia or minor depression).

Psychosis was assessed with a modified Parkinson's Psychosis Rating Scale (PPRS),[45] a 5-item rater-administered questionnaire. A positive response to any hallucination item or the paranoia item was considered a positive response for the presence of psychosis.[46] Global cognitive status was assessed with the Mini-Mental State Examination (MMSE).[47]

Neurological and Medical Assessments

Severity of PD was assessed with the Unified Parkinson's Disease Rating Scale (UPDRS)[48] motor score and the Hoehn and Yahr Scale.[49] The two UPDRS items assessing the ongoing presence of “off” periods and dyskinesias were also included. Attempts were made to assess patients in their “on” state, but this was not always possible. Disability was assessed with the Schwab and England Scale.[50]

Overall medical burden was assessed using the sum of medical conditions from a checklist of 16 common medical conditions (PD excepted) from the Multilevel Assessment Instrument (MAI).[51]

Analyses

All statistical procedures were performed with SPSS 14.0 for Windows.[52] Logistic regression analyses were used to determine the association between demographic and clinical variables (independent variables) and the presence of either suicidal or death ideation (dependent variable). Univariate logistic regression models for each independent variable of interest were run first, and all independent variables that were associated (P value ≤ 0.05) with the presence of either suicidal or death ideation were entered into a multivariate logistic regression model. For the multivariate model, to control for multiple comparisons a P value ≤ 0.01 was considered significant. To put the results for the IDS in a clinical context, the score was transformed so that the changes in the odds ratio were based on an 8-point change in IDS score, each increment corresponding roughly to a change in level of depression severity.[43]

RESULTS

Subject Characteristics

Overall, patients were representative of PD patients in specialty care settings (Table 1), with PD of mild-moderate severity and disease duration of 7 years on average. The mean MMSE score was (28.6) and only 3 (2.6%) subjects had an MMSE score < 24 , suggesting that patients, on average, had intact global cognition. Overall rates of depression (37.9%), and major depression specifically (27.6%), were similar to that reported in other studies of PD patients receiving specialty care.[29] Regarding comorbid disorders, we found that depressed patients were more likely to have psychosis than nondepressed patients (44% vs. 24%, respectively, $X^2 = 4.4$, $df = 1$, $P = 0.04$).

Table 1. Clinical and demographic characteristics	
Variable	Mean (SD) or percentage
Demographic	
Age	64.7 (10.4)
Sex (% male)	75.0%
Race (% white)	93.1%
Education	15.6 (3.2)

Marital status (% married)	81.0%
PD-related	
Duration PD	7.1 (5.8)
UPDRS motor score	19.0 (9.8)
Hoehn and Yahr stage	2.3 (0.8)
Schwab and England score	91.8 (8.9)
Dyskinesias (% yes)	25.0%
“Off” periods (% yes)	35.3%
History of DBS (% yes)	12.3%
Psychiatric, cognitive, and medical	
IDS score	20.8 (13.5)
Depression diagnosis - any (% yes)	37.9%
Major depression (% yes)	27.6%
Nonmajor depression (% yes)	10.3%
Psychosis (% yes)	29.3%
Heavy alcohol use (% yes)	3.4%
MMSE score	28.6 (1.9)
History of ICD during PD (% yes)	12.9%
Number of active medical conditions	2.8 (1.8)
Death and suicide ideation	
Death ideation (% yes)	28.4%
Suicide ideation (% yes)	11.2%
Death or suicide ideation (% yes)	30.2%

Frequency of Suicidal and Death Ideation

Current death ideation and suicidal ideation were present in 28.4% and 11.2% of the sample, respectively, with 30.2% of the sample experiencing either death or suicidal ideation. Positive responses were endorsed as follows for the death ideation items: 23.3% for “Has there been a time in the last month when you felt life was not worth living?”,

and 19.8% for “Has there been a time in the last month that you wished you were dead, for instance that you would go to sleep and not wake up?”

Positive responses were endorsed as follows for the suicide ideation items: 8.6% for “Has there been a time in the last month that you thought of taking your own life, even if you would not really do it?”, and 3.4% for “Has there been a time in the last month when you reached the point where you seriously considered taking your own life, or perhaps made plans how you would go about doing it?” A total of 9.5% of the sample experienced both death and suicide ideation.

In contrast to the relatively frequent occurrence of current suicidal and death ideation, only 5 subjects (4.3%) reported a lifetime suicide attempt. The number of subjects who had attempted suicide was insufficient to examine demographic or clinical correlates.

Correlates of Suicidal or Death Ideation Univariate Analyses

On univariate analysis, increasing severity of depressive symptoms, presence of psychosis, and a history of ICD behaviors during PD were associated with the presence of death or suicidal ideation (Table 2).

Table 2. Univariate logistic regression analysis for death or suicide ideation			
Variable	Death or suicide ideation (n = 35)		
	Odds ratio (Exp[B])	95% confidence interval for odds ratio	P-value
Age	>0.99	0.96-1.03	0.11
Sex	1.60	0.66-3.89	0.30
Race	0.76	0.15-3.95	0.74
Education	0.96	0.85-1.09	0.51
Marital Status	1.08	0.38-3.04	0.89
Duration PD	1.03	0.96-1.10	0.37
UPDRS motor score	1.01	0.97-1.05	0.75
Hoehn and	1.45	0.84-2.48	0.18

Yahr stage			
Schwab and England score	0.97	0.93-1.01	0.17
Dyskinesias	1.31	0.53-3.20	0.56
“Off” periods	2.24	0.99-5.08	0.06
History of DBS	1.84	0.59-5.76	0.30
IDS score	2.92	2.01-4.24	<0.001
Psychosis	2.45	1.05-5.69	0.04
MMSE score	0.91	0.74-1.11	0.34
History of ICD	6.08	1.90-19.49	0.002
Heavy alcohol use	2.39	0.32-17.72	0.39
Active medical conditions	0.99	0.80-1.24	0.96

Examining ideation by depression diagnosis, suicidal or death ideation was significantly more common in patients with a depression diagnosis (61.4% vs. 11.1%, $X^2 = 32.7$, $df = 1$, $P < 0.001$). Looking at depression subtype, patients with major depression ($X^2 = 31.2$, $df = 1$, $P < 0.001$), but not those with nonmajor depression ($X^2 = 0.8$, $df = 1$, $P = 0.36$), had a higher prevalence of suicidal or death ideation than nondepressed subjects. Examining a broader range of psychiatric disorders, 88.6% (31/35) of patients with current death ideation or suicidal ideation either had a depression diagnosis, psychosis, or a history of ICD behaviors sometime during PD.

Multivariate Analyses

On multivariate logistic regression analysis, only increasing severity of depressive symptoms was associated with the presence of suicidal or death ideation (Table 3). Substituting a diagnosis of major depressive disorder for IDS score in the multivariate model, only major depression diagnosis (odds ratio = 4.04, 95% CI = 3.37-24.48, $P < 0.001$) was associated with death ideation or suicide ideation.

Table 3. Multivariate logistic regression analysis for death or suicide ideation	
Variable	
Death or suicide ideation (n = 35)	

	Odds Ratio (Exp[B])	95% confidence interval for odds ratio	P-value
IDS score	2.76	1.88-4.07	<0.001
Psychosis	1.12	0.37-3.43	0.84
History of ICD	2.27	0.49-10.04	0.30

DISCUSSION

Our results suggest that suicidal or death ideation is common in PD, though not clearly more so than in the elderly population in general, and that suicide attempts may be rare. Using regression models, we found that psychiatric symptoms and disorders, rather than PD-related variables, predict suicidal or death ideation.

There are several limitations to our study. First, the absence of a control group prevents us from determining if suicidal or death ideation is more common in PD than in other populations. However, regardless its relative frequency, the occurrence of active suicidal or death ideation in almost one-third of PD patients is of clinical significance. Second, by using a modified version of the Paykel Scale (i.e., self-administered and using a past-month time frame), our results cannot be completely compared with earlier research. Third, we were not able to examine all factors that have been reported to be associated with death ideation or suicidal ideation in the general population (e.g., social isolation), although we were able to include many major risk factors. Finally, the sample predominantly consisted of elderly white males receiving specialty care, so our findings are not generalizable to all PD patients. Related to this, our frequency of major depression (27.6%) was similar to that reported in tertiary care settings but higher than the 5-10% reported in studies of PD patients outside of specialty care.[\[53\]](#)[\[54\]](#)

Nonmotor complications, particularly depressive symptoms, were closely related to the presence of suicidal or death ideation. This finding supports both the limited research that has been conducted to date in PD[\[31\]](#)[\[33\]](#)[\[34\]](#) and with the literature in non-PD patients.[\[19\]](#)[\[20\]](#)[\[55-59\]](#) Of note in our study, only major depression was associated with suicidal or death ideation on univariate analysis, highlighting the need to query about suicide ideation and intent in patients with more severe depression.

Other psychiatric complications, such as a history of ICD behaviors during PD and current psychosis, also seem to play a role in the occurrence of suicidal or death ideation. In our review of the published ICD literature, we found little mention of suicide ideation related to ICDs and only a single case report of a completed suicide.[\[60\]](#) However, ICDs

can have devastating, long-term psychosocial complications that may contribute to chronic suicidal or death ideation. Regarding psychosis, we are not aware of any literature reporting an association between it and suicidal or death ideation in PD, but the high frequency of comorbid depression may explain the higher prevalence of suicidal or death ideation in PD patients with psychosis.

In terms of demographic and PD-related variables, none were associated with suicidal or death ideation on univariate analyses. Thus, just as there is evidence that depression is the most significant predictor of disability in PD,[61][62] it also appears that psychiatric symptoms and disorders are the biggest contributors to suicidal and death ideation in this population.

Clinically, PD patients who present with either suicidal or death ideation should be further assessed for depression and other psychiatric disorders, including psychosis and a history of ICD behaviors. Depressed patients should be asked about suicidal ideation and death ideation, as the presence of either is likely a marker for a more severe depressive episode, represents a risk factor for a suicide attempt or completed suicide, and should lead to prompt depression treatment, including strong consideration of psychiatric referral. Only half of the depressed patients with suicidal or death ideation in our sample were being treated with an antidepressant (data not shown), suggesting underrecognition and undertreatment of clinically significant depression in PD. Regarding management, there is evidence that adherence to expert guidelines for depression management in the elderly is associated with improvement in both depression severity and suicide ideation.[4]

Even if attempted and completed suicide are shown to be relatively uncommon in PD, the occurrence of active suicidal or death ideation in up to one-third of PD patients is noteworthy and clinically significant. Having such thoughts can be psychologically distressing, both to patients and loved ones, and may impact significantly on quality of life. Future research should determine the relative frequency of suicidal and death ideation in PD in comparison to other populations, its clinical impact and course, and more fully explore risk factors for its occurrence.

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