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LETTER TO THE EDITOR

Resilience and Trauma among Patients with Parkinson's Disease during the COVID-19 Pandemic

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Dear Editor,

On 30 January 2020, the World Health Organization reported the emergence of a novel disease (i.e., COVID-19) due to the newly identified coronavirus SARS-CoV-2. The disease was first reported a few weeks earlier in China and was described as a public health emergency of international concern.

Elderly individuals are most vulnerable to COVID-19, especially those with frailty.[1] Parkinson's disease (PD) is a neurodegenerative disorder that significantly contributes to neurological frailty and therefore makes patients more susceptible to the detrimental effects of COVID-19.[2]

Beyond the direct consequences of the infection, the pandemic has led to a significant amount of stress among the general population for several reasons, including unclear information about the infection from the media, the shortage of medical resources and protective supplies, lockdown restrictions, and more generally, the socioeconomic consequences of the pandemic. Among other vulnerable individuals, PD patients have experienced severe psychological impacts due to COVID-19.

Resilience is defined as the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress. Resilience predicts positive adaptation to chronic conditions.[3] As dopaminergic signaling mediates stress susceptibility and resilience,[4,5] it is possible that low levels of the latter could have driven maladaptive behaviors and emotional distress in patients with PD during the COVID-19 pandemic. We therefore investigated how resilience was related to the traumatic consequences of the COVID-19 pandemic and health-related quality of life (HRQoL) in an outpatient sample of consecutive PD patients.

Soon after the lockdown restrictions were lifted in Italy, patients were assessed in person using a structured set of assessments (Supplementary Material in the online-only Data Supplement), including two versions of the visual analog scale (VAS) to assess their level of worries about COVID-19 in general terms (for example, about the socioeconomic impact of the pandemic) and specifically about their health condition; the Brief Resilience Scale (BRS); and a modified version of the Trauma Screening Questionnaire (TSQ). Additionally, a standardized instrument was administered to assess two components of HRQoL: the health state description [EuroQoL-5 dimensions (EQ-5D)], which comprises five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and the health state evaluation (EQ-VAS), which assesses overall health status using a VAS ranging from 0 to 100. Details about the statistical methods are provided in the Supplementary Material (in the online-only Data Supplement).

Fifty PD patients (34 M/16 F) with a mean age of 72.14 ± 8.70 years, a mean disease duration of 6.54 ± 3.94 years, and a mean Movement Disorder Society−Unified PD Rating Scale, part 3 score of 26.52 ± 12.21 participated in the current study after providing written consent to participate. Neither the respondents nor their family members reported being infected with COVID-19. Since all patients scored below the proposed BRS cutoff of 3, indicating low levels of resilience, they were stratified into

two subgroups according to their median score (i.e., BRS median = 2.3; range = 1.0−2.9) to allow within-group comparisons. The groups did not differ in terms of motor disability (Figure 1, Supplementary Table 1 in the online-only Data Supplement), whereas patients with lower resilience levels had higher levels of COVID-19-related worries both in general terms and specifically about their health condition, as well as higher TSQ scores and poorer HRQoL measures (Figure 1, Supplementary Table 1 in the online-only Data Supplement). As expected, patients with lower BRS scores displayed higher levels of depression and anxiety according to scores on the mood dimension of the EQ-5D (0.59 ± 0.57 vs. 0.17 ± 0.38, respectively, $p < 0.01$). BRS scores were correlated with TSQ scores ($\rho = -0.509$; $p < 0.05$), with both COVID-19-related worries in general terms ($\rho = 0.416$; $p < 0.05$) and specifically about health status ($\rho = 0.574$; $p < 0.05$), as well as with EQ-5D ($\rho = 0.356$; $p < 0.05$) and EQ-VAS scores ($\rho = 0.401$; $p < 0.05$). The mood dimension of the EQ-5D was correlated with the BRS score ($\rho = -0.56$, $p < 0.05$) and EQ-VAS scores ($\rho = -0.45$; $p < 0.05$) but not with the TSQ score ($\rho = 0.37$; $p > 0.05$).

The current results demonstrate that the psychological stress of COVID-19 and its detrimental effect on the HRQoL of patients with PD might have been primarily driven by patients' resilience levels. Interestingly, according to the BRS normative values, all patients showed low levels of resilience (i.e., BRS < 3),
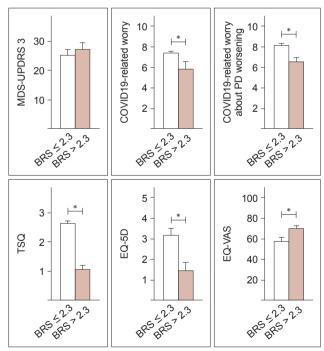
which might indicate a dopaminergic contribution to this psychological function.[4,5] Notably, resilience was not influenced by either disease duration or severity, which implies that the negative consequences of COVID-19, both in terms of psychological stress and HRQoL outcomes, do not largely depend upon the baseline levels of frailty in this population.[6] In line with previous research, we observed that resilience was also influenced by mood dysfunction. However, mood dysfunction did not correlate with the TSQ score, indicating that the former did not strongly influence the psychological reaction to the pandemic. Of note, a nonsignificant trend was observed in terms of gender distribution between the two groups of patients ($p = 0.06$) (Supplementary Table 1 in the online-only Data Supplement), perhaps owing to the relatively small size of our sample. This possible gender-related difference must be carefully investigated in future research. We acknowledge the lack of a control group of healthy subjects, and thus, a similar relationship between resilience and the traumatic consequences of the COVID-19 pandemic could be observed in the general population. However, we used the normative values of the BRS, according to which we found very low levels of resilience in the PD population, and this, in turn, arguably drove the psychological consequence of the pandemic in a major way.

It is undoubtful that the COVID-19 pandemic has been an extraordinarily dramatic experience that, we hope, will soon cease to be part of our daily life. However, this has also proven to be an opportunity to investigate how PD patients could face traumatic experiences and life adversity. Our results point to resilience as a crucial feature in this regard that further impacts HRQoL. Given that resilience can be enhanced with specific interventions,[7] it is advisable to promote this resource among this frail population.

Figure 1. Comparisons of the main variables between patients stratified according to the median value of the BRS. Vertical bars indicate standard errors. Asterisks indicate statistical significance ($p < 0.01$). BRS: Brief Resilience Scale, PD: Parkinson's disease, TSQ: Trauma Screening Questionnaire, UPDRS: Unified Parkinson's Disease Rating Scale, EQ-5D: EuroQoL-5 dimensions, EQ-VAS: EuroQoL-visual analogue scale.

Ethics Statement

Supplementary Materials

Conflicts of Interest

Acknowledgments

Author Contributions

Conceptualization: Roberto Erro. Data curation: Roberto Erro, Emanuele Nigro. Formal analysis: Roberto Erro, Emanuele Nigro. Investigation: Sofia Cuoco, Raffaele Ragone, Emanule NIgro. Methodology: Roberto Erro. Project administration: Roberto Erro, Paolo Barone. Supervision: Roberto Erro. Validation: Roberto Erro, Paolo Barone. Visualization: Roberto Erro. Writing—original draft: Roberto Erro. Writing—review & editing: Sofia Cuoco, Raffaele Ragone, Emanuele Nigro, Paolo Barone.

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SUPPLEMENTARY MATERIAL

Methods

Beyond the gathering of demographic and clinical data [i.e., Movement Disorder Society – Unified Parkinson Disease Rating Scale, motor score (MDS-UPDRSIII), and Hoehn and Yahr (HY) scale], all patients were evaluated using a structured set of questionnaires/scales, as follows:

1) From 0 (not at all) to 10 (very much so), how much would you rate your level of worries regarding the COVID-19 pandemic in general terms (for example about the socio-economical consequences, loved ones being infected, etc.)?

2) From 0 (not at all) to 10 (very much so), how much would you rate your level of worries regarding the effect that COVID-19 pandemic might have on your condition (i.e., Parkinson's disease)?

3) Brief Resilience Scale[1]

4) A modified version of the Trauma Screening Questionnaire (TSQ):[2]

Please consider the following reaction which sometimes occur after a traumatic event. This questionnarie is concerned with your personal reactions to the COVID-19 pandemic. Please indicate whether or not you have experienced any of the following at least twice in the past week:

a) Upsetting thoughts or memories about the COVID-19 that have come into your mind against your will

b) Upsetting dreams about COVID-19

c) Feeling upset by reminders of the COVID-19 pandemic

d) Bodily reactions (such as fast heart beating, stomach churning, sweatiness, dizziness) when reminded of COVID-19

e) Difficulty falling or staying asleep (more than before the COVID-19 occurred)

f) Irritability or outbursts of anger (more than before the COVID-19 occurred)

g) Difficulty concentrating (more than before the COVID-19 occurred)

h) Heightened awareness of potential dangers to yourself or others

i) Being jumpy or being startled at something unexpected

5) EQ-5D and EQ-VAS[3]

Statistical analysis

After checking for normality distribution with the Shapiro Wilk test, PD patients with BRS score ≤ 2.3 vs. and > 2.3 were compared in terms of all gathered demographic and clinical data by means of the t-test for continuous variables and the chi-squared or Fisher's exact test for categorical variables, as appropriate, $p < 0.05$ being deemed significant. Correlations between the gathered variable were performed by means of the Spearman's rank test, with Sidak-Dunn correction. Statistical analyses were performed using Stata v.13 (StataCorp LP, College Station, TX, USA).

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Supplementary Table 1. Demographic and clinical comparisons between patients stratified according to the median Brief Resilience Scale (BRS) score (i.e., BRS ≤ 2.3 vs. BRS > 2.3)

	Patients with BRS ≤ 2.3 (*n* = 25)	Patients with BRS > 2.3 (*n* = 25)	*p*
Age (years)	73.96 ± 8.66	70.00 ± 8.436	0.109
Sex (M/F)	15/10	20/5	0.067
Age at onset (years)	67.41 ± 8.62	63.47 ± 7.02	0.081
Disease duration (years)	6.55 ± 3.81	6.52 ± 4.17	0.976
MDS-UPDRS 3	25.48 ± 12.83	27.73 ± 11.61	0.521
HY stage	2.20 ± 0.71	2.17 ± 0.46	0.864
Consultation delay due to service shutdown (days)	98.71 ± 59.58	88.60 ± 57.59	0.547
COVID-19 related worries	7.44 ± 1.52	5.91 ± 2.82	0.018
COVID-19 related worries about health status	8.04 ± 1.51	6.56 ± 2.98	0.028
TSQ	2.70 ± 1.83	1.13 ± 0.96	0.001
EQ-5D	3.18 ± 2.20	1.52 ± 1.73	0.005
EQ-VAS	58.70 ± 17.89	70.86 ± 12.49	0.008

Values are expressed as mean ± standard deviation, unless othewise specified. *$p < 0.05$. BRS: Brief Resilience Scale, EQ-5D: EuroQoL-5 dimensions, EQ-VAS: EuroQoL-visual analogue scale, M: male, F: female, UPDRS: Unified Parkinson's Disease Rating Scale, HY: Hoehn and Yahr, TSQ: Trauma Screening Questionnaire.