

Assessment of Depression in Patients with COVID-19

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Abstract: *The COVID-19 pandemic is probably the greatest natural disaster of our generation and the 21st century with a great impact on mental health. The present study aims to quantify, with the help of the Beck questionnaire, the degree of depression in a group of 109 patients with moderate forms of COVID-19, hospitalized in the Second Clinic of the Clinical Hospital for Infectious Diseases St. Cuv. Parascheva Galați during the period: 1.01-30.03.2021. Of these, 35 patients (32.11%) had varying degrees of depression, and had an age and body mass index statistically significantly higher than those without depression. These patients also had statistically significantly higher Charlson scores of cumulative comorbidities and required longer hospitalization than patients without depression. The severity of COVID-19 and the percentage of favorable prognosis did not show statistically significant differences between the two groups. Our study reveals a lower incidence of depression among patients with COVID-19 compared to existing studies in the literature. This can be explained by the fact that our study is conducted at the end of the first year of the pandemic when antiviral therapy schemes stabilized and population vaccination began. The high genetic variability of the virus, which can determine at any time the appearance of new strains with greater aggression, contagion or with mutations on the spike protein, maintains the need to keep non-specific preventive measures and the mental tension related to this pathology. Thus, intrapandemic psychiatric disorders remain a major public health problem and require strong government prevention and control measures.*

Keywords: COVID-19, depression, Beck questionnaire, prophylaxis, control.

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Introduction

The COVID19 pandemic is a new and traumatic experience for the whole society. Being a new virus for which no organism had immunity, the disease was a threat to all individuals. The illness and even the death of great personalities have shown that we are all susceptible to this disease. Thus, the fear of death or severe physical harm has impacted the mental health of the population.

Until the arrival of the vaccine, social isolation, and increased attention to hygiene measures were the only methods of disease prevention. The impact of this social isolation on the mental health of the population is important and being quantified by clinical trials (Luca, Baroiu et al. 2020; Marin et al., 2020).

The economic impact of these disease prevention measures, together with the loss of jobs or a significant decrease in family income has further altered the fragile mental balance of these people.

Prepandemic studies have shown that social isolation is accompanied by an unfavorable prognosis of mental health and an increased risk of mortality, especially from cardiovascular disease (Anghel et al., 2011; Leigh-Hunt et al., 2017).

Also before the pandemic, it was observed that job loss is associated with depression and anxiety as well as an increased risk of suicide (Luca, Ciubara et al., 2020; Paul & Moser, 2009; Sandu, 2020a).

In 2017, there were an estimated 264 million people with depression globally, a proportion of 3.44% of the general population (Ritchie & Roser, 2018).

A meta-analysis of population studies from the beginning of the pandemic (until May 2020) observed prevalence rates of depression ranging from 7.45% to 48.30%. The cumulative prevalence of depression was 25% (95% CI: 18% -33%). Thus, compared to the estimated global prevalence of depression, of 3.44%, in 2017, this meta-analysis notes an increase associated with the pandemic, 7 times higher, of the prevalence of depression in the general population, thus suggesting an important impact of COVID-19 on people's mental health (Bueno-Notivola et al., 2021).

A study in Bangladesh, on 1002 adult patients with COVID-19, of which 21% were hospitalized, found, using the Patient Health Questionnaire (PHQ-9), that 48% of participants reported symptoms of moderate and severe depression and 22% symptoms of mild depression. The study also notes that depression is associated with decreased family income, poor health status, sleep disorders, reduced physical activity, hypertension,

chronic respiratory pathology, fear of reinfection with SARS-CoV-2 and persistence of COVID-19 symptoms (Islam et al., 2021).

The present study aims to quantify, with the help of the Beck questionnaire, the degree of depression in a group of 109 patients with medium and mild forms, of COVID-19, hospitalized in the Second Clinic of Infectious Diseases, Clinical Hospital for Infectious Diseases St. Cuv. Parascheva Galați, between 1.01.2021-30.03.2021.

Material and method

A prospective observational study was performed on a group of 109 patients with medium forms of COVID-19 hospitalized in the Second Clinic of Infectious Diseases of the Clinical Hospital of Infectious Diseases St. Cuv. Parascheva Galati in the period 1.01-30.03.2021, where the evolution of COVID-19 was monitored and the Beck questionnaire was applied to assess the degree of depression of patients with COVID-19. We mention that none of the patients included in the study were diagnosed with depression before the episode of COVID-19.

Criteria for inclusion in the study:

- adults with SARS-CoV-2 rapid positive antigen test or PCR positive;
- patients who have given written informed consent (Sandu, 2020b) to participate in the study, staff in full knowledge of the facts.

Exclusion criteria from the study

- patients who are unconscious or unable to sign informed consent;
- patients who refused to participate in the study;
- pregnant or breastfeeding women.
- patients under 18 years of age.
- patients who had extreme values ("outliers") at the usual laboratory tests (D-dimer, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), serum glycemia, alanyl aminotransferase (ALT), aspartate aminotransferase (AST), bilirubin (BR), prothrombin concentration, creatine kinase (CK), troponin, serum creatinine).

The 109 patients with confirmed COVID-19 were divided into 2 groups: group A (N = 74) consisting of patients with a score between 0 and 9 on the Beck questionnaire, considered without depression, and group B (N = 35) consisting of patients with a score between 10 and 57 on the Beck questionnaire, considered to have mild, moderate and severe depression. It should be noted that not all patients had full data available.

MedCalc, version 15.8, was used for statistical analysis.

Statistical analysis of demographic data was performed on the group of patients without depression (group A) and was compared to the group with depression (group B). The presentation is in the form of Mean $\pm$ D.S (standard deviation) for the continuous variables and in the form of absolute frequency (relative frequency) for the categorical variables.

Results

The Beck questionnaire includes 21 questions with a score between 0 and 4 points. This questionnaire was handed to patients on the second or third day of hospitalization and collected after 2 hours. The results of the questionnaire processing were: 74 normal patients (67.88%), with a score between 0 and 9 points, 22 patients (20.18%) with mild depression, with a score between 10 and 15 points, 9 patients (8.25%) with moderate depression, with a scores between 16 and 23 points and 4 patients (3.66%) with severe depression, with a scores between 24 and 57 points. Thus, 35 patients were detected with various degrees of depression that appeared or were exacerbated by the fear of severe disease, death or oxygen dependence.

The group with depression was statistically compared to the group without depression and the following were observed (table 1, table 2):

- in both groups, women and the urban environment predominated.
- the average age of the group with depression (62.17 years) was statistically significantly higher than that of the group without depression (50.32 years). Age over 65 years is recognized as a risk factor for the severe course of COVID-19 and this may contribute to depression in elderly patients.

- the average body mass index was statistically significantly higher in the group that was depressed than in the group without depression. In the group with depression there were 6 overweight patients (19.35%) and 16 (51.61%) with obesity and in the group without depression there were 28 overweight patients (40.57%) and 16 patients (23.18%) with obesity. Obesity is recognized as a risk factor for the severe course of COVID-19 and this may contribute to depression.

- patients' comorbidities were studied from 3 points of view, namely:
 - comorbidities at risk for severe evolution of COVID-19 (hypertension, diabetes, chronic respiratory diseases) did not show statistically significant differences between the 2 groups.

- neuropsychiatric comorbidities were anxiety syndrome, psychoinvolutive syndrome and stroke sequelae in 4 patients in the group with depression (11.42%) and moderate mental retardation, Alzheimer's disease, stroke sequelae in 5 patients without depression (6.75%). These

comorbidities predispose to depression and are more common in the depressed group.

- the accumulation of comorbidities, quantified by the Charlson score that assesses life expectancy according to comorbidities is statistically significantly higher in the group with depression which may justify the increased fear of these patients of unfavorable evolution of COVID-19.

- the clinical evolution of COVID-19 towards cure or transfer in intensive care units, as well as the Curb 65 score of pneumonia severity did not have statistical differences between the two groups.

- the number of days of hospitalization was statistically significantly higher in patients with depression.

- the biochemical parameters for quantifying inflammation, coagulation, renal, hepatic and pancreatic function did not show statistically significant differences between the 2 groups except for the average total bilirubin which was statistically significantly higher in the group with depression compared to the group without depression.

Table 1. Comparative statistical analysis of demographic data and comorbidities

Variable		Group A (COVID-19 without depression)	Group B (COVID-19 with depression)	P value (T- test)
Age– Mean $\pm$ D.S		50.32 $\pm$ 17.52	62.17 $\pm$ 15.18	0.0008
BMI – Mean $\pm$ D.S		27.39 $\pm$ 5.12	29.90 $\pm$ 4.76	0.0226
Sex	M –No (%)	32 (42.66)	17(48.57)	0.7090
	F – No (%)	42 (57.33)	18(51.42)	
Medium of origin	Urban–No(%)	44(59.45)	25 (71.42)	0.3184
	Rural–No(%)	30(40.54)	10 (28.57)	
Hypertension	Yes–No(%)	26 (35.13)	14 (40)	0.7797
	No–No (%)	48 (64.86)	21 (60)	
Diabetes	Yes–No(%)	9 (12.16)	5 (14.28)	0.9982
	No–No (%)	65 (87.83)	30 (85.71)	
Chronic respiratory diseases	Yes – No (%)	2 (2.70)	3 (8.57)	0.3801
	No – No (%)	72 (97.29)	32 (91.42)	
Chronic neuropsychiatric diseases	Yes – No (%)	5 (6.75)	4(11.42)	0.6494
	No – No (%)	69 (93.24)	31 (88.57)	
Charlson score – Mean $\pm$ S.D.		1.51 $\pm$ 1.52	2.51 $\pm$ 1.91	0.0039
Curb 65 score– Mean $\pm$ S.D.		1.25 $\pm$ 0.62	1.47 $\pm$ 0.66	0.0931

Number of hospitalization days – Mean $\pm$ S.D.	10.05 $\pm$ 3.53	11.54 $\pm$ 3.50	0.0415
Unfavorable evolution-No (%) of patients transferred to intensive care)	1(1.35)	3(8.57)	0.1847

Source: Authors' own conception

Table 2. Comparative analysis of paraclinical parameters in the two studied groups (mean values $\pm$ standard deviation)

Variable	Group A (COVID-19 without depression)	Group B (COVID-19 with depression)	P value (T-test)
D Dimer - Mean$\pm$S.D.	731.33 $\pm$ 698.77	1103.35 $\pm$ 1236.04	0.0598
ESR - Mean$\pm$S.D.	39.41 $\pm$ 28.16	46.36 $\pm$ 27.42	0.2508
CRP - Mean$\pm$S.D.	40.60 $\pm$ 62.43	47.23 $\pm$ 58.62	0.6568
Serum glycemia- Mean$\pm$S.D.	124.69 $\pm$ 42.14	130.14 $\pm$ 55.16	0.5834
ALT - Mean$\pm$S.D.	55.28 $\pm$ 7.08	50.19 $\pm$ 47.69	0.6925
AST - Mean$\pm$S.D.	43.28 $\pm$ 39.55	48.93 $\pm$ 33.80	0.4744
Bilirubin– Mean$\pm$S.D.	0.53 $\pm$ 0.37	0.81 $\pm$ 0.56	0.0093
Prothrombin concentration - Mean$\pm$ S.D.	93.62 $\pm$ 24.46	87.20 $\pm$ 34.40	0.3357
CK - Mean$\pm$ S.D.	159.36 $\pm$ 304.75	170.81 $\pm$ 227.16	0.8499
Troponin - Mean$\pm$ S.D.	14.76 $\pm$ 24.36	15.08 $\pm$ 13.82	0.9567
Creatinine - Mean$\pm$ S.D.	0.93 $\pm$ 0.23	0.98 $\pm$ 0.29	0.3460
Number of days oxygen needed - Mean$\pm$ S.D.	2.12 $\pm$ 3.51	3.21 $\pm$ 3.67	0.1535
Minimum oxygen saturation - Mean$\pm$ S.D.	92.87 $\pm$ 4.42	91.38 $\pm$ 5.04	0.1227

Source: Authors' own conception

Conclusions

A significant percentage (32.11%) of the studied group, with patients with COVID-19, presented different degrees of depression, quantified by the Beck questionnaire.

These patients had a medium age and body mass index statistically significant higher than those without depression.

Also, these patients with depression had, a statistically significant higher, Charlson score of cumulative comorbidities and required longer hospitalization than patients without depression.

The severity of COVID-19 and the percentage of favorable evolutions did not show statistically significant differences between the two groups.

Discussions

Most clinical studies in the literature have quantified the occurrence of depression after the outbreak of the pandemic in the population not infected with SARS-CoV-2 and our study brings data on the presence of depression in patients with COVID-19 at the end of the first year of the pandemic. For example, a Dutch study compared the impact of a pandemic on mental health in patients to a pre-existing psychiatric pathology and those without pre-pandemic psychiatric impairment. The results of the study were surprising in the sense that people without depressive, anxious or obsessive-compulsive disorder showed a greater increase in symptoms during the COVID-19 pandemic, while people with prepandemic psychiatric impairment tended to have a mild decrease in symptoms. This conclusion draws attention to the need to establish global measures to prevent and monitor psychiatric alarm symptoms that may impact the prognosis and quality of life of all individuals (Berbinschi et al., 2014; Pan et al., 2021).

Vulnerable groups for psychiatric impairment, such as low-income people, single people and people with pre-existing psychiatric disorders, are described in the literature (Sandu et al., 2019; Sandu, 2020c; Sandu & Nistor, 2020; The Lancet, 2020; Yao et al., 2020).

The impact of the COVID-19 pandemic on mental health and the fear of COVID-19 are more strongly perceived among patients with prepandemic psychiatric impairment, with these individuals declaring a much greater effort than the general population to cope with the COVID-19 pandemic (Pan et al., 2021).

However, the levels of intensity of symptoms of depression, anxiety, worry and loneliness remained higher in people with pre-existing psychiatric disorders than in those without pre-pandemic psychiatric impairment, which suggests an increased need for care among people with mental health disorders (Pan et al., 2021).

Patients with multiple comorbidities when they develop COVID 19 have a higher risk of depression, as evidenced by our study that observed a higher Charlson score in patients with depression. Clinical studies note a correlation between the increased risk of severe infections in patients with multiple comorbidities, which may explain their mental fragility (Baroiu et al., 2021; Cambrea et al., 2013; Halichidis et al., 2013; Sandu, 2019).

Regarding the depression in the general population, which appeared during the pandemic, most studies give higher figures than the prepandemic ones, between 7.45% and 48.30% (Bueno-Notivola et al., 2021; Ettman et al., 2020; Shader, 2020).

In patients with COVID-19, clinical trials note figures up to 70% of patients, associating various degrees of depression, figures that require the introduction in the COVID-19 therapy protocol of interventions for prevention and treatment of depression and the need to introduce a psychiatrist in the multidisciplinary team who treat these patients (Islam et al., 2021; Perlis et al., 2021). Complex treatment of COVID-19 and comorbidities should take into account possible drug interactions and the addition of adverse reactions (Niculet et al., 2020; Tiutiuca et al., 2017; Zia-Ul-Hag et al., 2014).

Our study notes the occurrence of depression in 32.11% of patients with moderate and mild forms of COVID-19, treated in our clinic for Infectious Diseases. This is a worrying figure for us clinical infectionists but it is lower than the figures in the literature and it can be explained by the fact that our study was conducted one year after the outbreak of the pandemic, after the start of vaccination and after the stabilization of antiviral treatment regimens. The possibility of the SARS-CoV-2 virus having high genetic variability with the rapid emergence of new strains and the confrontation with this third pandemic wave, however, it overshadows the enthusiasm that emerged after the start of vaccination. Thus, intrapandemic psychiatric disorders remain a major public health problem and require strong government prevention and control measures.

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