ORIGINAL ARTICLE

Anxiety and depression in the first 24 h in COVID-19 patients who underwent non-invasive mechanical ventilation in the intensive care unit

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Abstract

Background and aims The aim of this study was to investigate the degree of anxiety and depression in the first 24 h of people who were taken to the intensive care unit (ICU) due to COVID-19 and had to use unfamiliar devices in an unfamiliar environment.

Material method Sixty-two patients over 18 years of age, conscious and cooperative, who were admitted to the ICU with the diagnosis of COVID, were PCR (+), and needed non-invasive mechanical ventilation were included in the study. Age, gender, Acute Physiology and Chronic Health Evaluation (APACHE) II scores, and Hospital Anxiety Depression (HAD) A (anxiety), and HAD D (depression) scores of the patients were recorded, and the prevalence of anxiety and depression and independent factors affecting them were investigated.

Results The mean age of the patients was 57.1 ± 17.6 years, and the mean APACHE II was 29.3 ± 10.4. The average HAD A score was 10.5 ± 3.5 in all patients, while the HAD D score was 10.5 ± 3.3. The prevalence of anxiety was 37.1% (23 patients), and the prevalence of depression was 43.6% (27 patients). Age and APACHE II and anxiety/depression were negatively correlated, and when age and APACHE II scores increased, anxiety and depression decreased ($p < 0.05$).

Conclusion In COVID-19 patients who underwent non-invasive mechanical ventilation in the ICU, the rate of anxiety in the first 24 h of admission was 37.1% while for depression the rate was 43.6%. In addition, advanced age and high APACHE II scores were found to be associated with low anxiety and depression.

Trial registration ClinicalTrials ID: NCT04715477 (January 20, 2021).

Introduction

It is necessary to consider the effects of the COVID-19 epidemic on mental health as well as the effects on the physical health of individuals. As the duration of the COVID-19 pandemic increases, the frequency of patients' admission to the hospital changes. Patients apply to the hospital unless their condition becomes critical, and they apply to hospitals when their symptoms progress. In a recent study [1], it was determined that the number of applications to the red area increased statistically in emergency service applications. It can be frightening for patients to enter the intensive care unit under stress and healthcare workers in space suits where their faces are not visible. This situation may cause an increase in anxiety levels and the development of fear of death in the patient. Given that patients diagnosed with COVID-19 are more likely to have psychological concerns,

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such as fear of disease progression, disability, or premature death, it is vital to explore the prevalence and associated factors of anxiety and depression in COVID-19-infected patients.

In a meta-analysis by Deng et al. [2], the incidence of anxiety in COVID-19 patients was found to be 47%. In a systematic review and meta-analysis by Rogers et al. [3], summarizing psychiatric and neuropsychiatric presentations associated with SARS, MERS, and COVID-19 outbreaks, delirium was common in patients experiencing the acute stages of COVID-19. However, the prevalence of other psychiatric disorders, such as depression, anxiety, and sleep disorders, could not be evaluated due to lack of published data. In addition, none of the existing studies was conducted in the setting of the intensive care unit (ICU). It is important to recognize and manage the anxiety experienced by patients and to enable them to cope with anxiety effectively. It should be recognized that patients with COVID-19 are prone to anxiety and these disorders should be properly diagnosed and addressed in order to improve prognosis, shorten hospital stay and avoid long-term mental health problems.

As far as we are aware, there is no study evaluating the first 24 h of patients admitted to the ICU and undergoing non-invasive mechanical ventilation (NIMV). The aim of this study was to investigate the anxiety and depression in the first 24 h of people taken to ICU due to COVID-19 and had to use unfamiliar devices in this closed environment.

Material and method

This study was planned as a prospective cohort and undertaken at Kocaeli Derince Training and Research Hospital. The study was registered as a clinical trial and initiated after obtaining the approval of the ethics committee and written consent from the patients (approval number: 14.01.2021–2020-172; ClinicalTrials ID: NCT04715477). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Between January 15, 2021 and May 1, 2021, 62 patients with COVID, who were PCR (+), were admitted to ICU, needed non-invasive mechanical ventilation, were over 18 years old, and conscious and co-operative were included in the study. The need for NIMV was determined by the intensive care physician. Patients who had hearing-speech problems, who could not speak Turkish or English, who did not have the cognitive level to understand and answer questions, who had communication problems, such as dementia or Alzheimer's, and who received sedation were not included in the study.

The anxiety scale used in the study is the Hospital Anxiety Depression Scale (HADS; Hospital Anxiety Depression Measure). HADS is a self-assessment questionnaire designed to detect symptoms of anxiety and depression in general hospital patients. The validity and reliability study

for HADS in Turkey was performed by Aydemir et al. [4]. It is used to diagnose anxiety and depression in a short time and to determine the risk group. Seven of the 14 questions (1–3-5–7-9–11-13) measure anxiety (HAD A) and seven (2–4-6–8-10–12-14) depression (HAD D). Responses are scored on a four-point Likert scale between 0 and 3. The scoring of each item in the scale is different. Items 1, 3, 5, 6, 8, 10, 11, and 13 show decreasing severity and the scoring is 3, 2, 1, and 0. On the other hand, the second fourth, seventh, ninth, twelfth and fourteenth items are scored as 0, 1, 2, and 3, respectively. The lowest score that patients can get from both subscales is 0, and the highest score is 21. The degree of anxiety and depression is graded by cumulative score: a score of 0–7 indicates no anxiety or depression, a score of 8–10 indicates mild anxiety or depression, a score of 11–14 indicates moderate anxiety or depression, and a score of 15–21 indicates severe anxiety or depression.

In the study, the age, gender, Acute Physiology and Chronic Health Evaluation (APACHE) II scores, and HAD A and HAD D scores of the patients were recorded, and the prevalence of anxiety and depression and independent factors affecting them were investigated.

The primary aim of the study was to investigate the prevalence of first-day anxiety and depression in patients admitted to the intensive care unit due to COVID-19 and undergoing NIMV.

The secondary aim was to find the independent variables that affect anxiety and depression.

Statistical analysis

Categorical variables are presented as numbers and percentages while continuous variables are presented as mean ± standard deviation, with range (minimum–maximum). Comparison of the categorical variables between groups was done using chi-square or Fisher exact test. To evaluate the correlations between measurements, Pearson's correlation coefficient was used. The statistical level of significance for all tests was considered to be 0.05. Statistical analysis was performed using SPSS version 19 (IBM Software, Armonk, NY, USA).

Results

The mean age of the 62 patients included in the study was 57.1 ± 17.6 years. The female/male ratio was 20/42, and the mean APACHE II score was 29.3 ± 0.4. The average HAD A score reflecting anxiety was 10.5 ± 3.5 in all patients, while the HAD D score reflecting depression was 10.5 ± 3.3 (Table 1).

The prevalence of anxiety was found to be 37.1% (23 patients), and the prevalence of depression was 43.6% (27 patients) (Table 1).

Table 1 Descriptives and prevalence of HAD A and HAD D

	Mean ± sd		Min–max		Total
Age (year)	57.1 ± 17.6		18–65		62
Sex (female/male)	20/42				62
HAD A score	10.5 ± 3.5		5–20		62
HAD D score	10.5 ± 3.3		5–20		62
APACHEII	29.3 ± 10.4		10–47		62
	HAD A			HAD D		
	n	%	Total %	n	%	Total
Score 0–7	39	62.9	62.9	35	56.4	56.4
Score 8–10	10	16.1	37.1	10	16.1	43.6
Score 11–14	8	12.9		14	22.6	
Score 15–21	5	8.1		3	4.9	

HAD A Hospital Anxiety Depression — Anxiety, *HAD D* Hospital Anxiety Depression — Depression, *APACHE II* Acute Physiology and Chronic Health Evaluation II

When the parameters associated with anxiety and depression were examined, it was determined that anxiety and depression were negatively correlated with age (r: − 0,220 and r: − 0.278, respectively), and anxiety and depression decreased as age increased ($p < 0.05$). Although no correlation was found with gender, there was also an inverse correlation with APACHE II between anxiety (r: − 0.823) and depression (r: − 0.805). Accordingly, as APACHE II scores increased, patients' anxiety and depression decreased ($p < 0.05$) (Table 2).

Discussion

In this study, the incidence of anxiety in the first 24 h of admission to the ICU in patients who were admitted due to COVID-19 and underwent NIMV was 37.1% while that for depression was 43.6%. In addition, advanced age and high APACHE scores were associated with low anxiety and depression.

Since being diagnosed with COVID-19 poses a threat to life, daily routines are disrupted in the face of high anxiety, and a crisis situation occurs where stress and anxiety are at the forefront. If there is no effective intervention in this crisis, occurring within 1–3 days, the patient will experience symptoms such as numbness, impaired perception of reality towards the environment, recurrent nightmares, avoidance of emotions, and sleep disturbance that last between 3 days and 1 month. This situation, which can be considered as acute stress disorder, is one of the most important psychological problems that occur in the event of an epidemic. This disorder describes the state of helplessness, insecurity, fear, and anxiety experienced when the individual is exposed to a potentially fatal event [5].

It is vital to investigate the prevalence and related factors of anxiety and depression in the first 1–3 days of admission

Table 2 Correlations

		Age	Sex	HAD A score	HAD D score	APACHEII
Age	Pearson correlation	1	.230*	− **.220***	**− .278***	.496**
	Sig. (1-tailed)		.036	**.043**	**.014**	.000
Sex	Pearson correlation	.230*	1	−.128	−.091	.111
	Sig. (1-tailed)	.036		.160	.241	.195
HAD A SCORE	Pearson correlation	−.220*	−.128	1	.846**	−.823**
	Sig. (1-tailed)	.043	.160		.000	.000
HAD D SCORE	Pearson correlation	−.278*	−.091	.846**	1	−.805**
	Sig. (1-tailed)	.014	.241	.000		.000
APACHEII	Pearson correlation	.496**	.111	**−.823****	**−.805****	1
	Sig. (1-tailed)	.000	.195	**.000**	**.000**	
	N	62	62	62	62	62

HAD A Hospital Anxiety Depression — Anxiety, *HAD D* Hospital Anxiety Depression — Depression, *APACHE II* Acute Physiology and Chronic Health Evaluation II

*Correlation is significant at the 0.05 level (1-tailed); **correlation is significant at the 0.01 level (1-tailed)

to the ICU, in terms of the effectiveness of the treatment and the mental state in the next period. Although there is no similar study in the literature, the incidence of anxiety in COVID-19 patients varies between 34% [6], 36% [7], and 47% [2]. The prevalence of depression in the same studies was found to be 45% [2], 28% [6], and 29% [7]. These frequencies are in keeping with those found in our cohort of patients.

In the study conducted by Kong et al. in COVID-19 patients [6], the mean HAD A score was 6.35 ± 4.29 and the HAD D score was 5.44 ± 4.32. Again, in the study of Parker et al. [7], the mean HADS-A score at study entry was 5.4 and the mean HADS-D score at study entry was 6.3. However, these anxiety and depression studies were not conducted in ICU patients. In the same study by Parker et al. [7], the mean HADS-D score of the patients admitted to the ICU was 10.8 at the time of entry to the study, while it was 5.9 for the participants who were not admitted to the intensive care unit during the same period. In our study, HAD A and HAD D scores were found to be 10.5 ± 3.5 and 10.5 ± 3.3, respectively. The high HADS scores found in our study are in line with those reported by Parker et al. [7] in ICU patients, and thus, admission to ICU appears to be a trigger for greater anxiety and depression in patients needing intensive care.

In our study, it was found that anxiety and depression were negatively correlated with age, and anxiety and depression decreased as age increased. There was no correlation with gender, but there was an inverse correlation with APACHE II. Accordingly, as APACHE II scores increased, anxiety and depression decreased in patients ($p < 0.05$). In contrast, Kong et al. found that being old and being a woman were associated with high anxiety levels [6]. These differences may be due to the fatalism phenomenon and differences in cultural factors, which are more effective in the elderly, causing our population to withstand life stresses more easily.

Considering that anxiety and depression are associated with longer hospital stays and non-compliance with treatment in various diseases [6], early recognition and prevention of mental health problems will be vital to improve clinical outcomes, shorten hospital stays, and have a better subsequent quality of life. While the COVID-19 epidemic continues, it seems appropriate to highlight the need for developing an effective psychological support strategy, not only for the diagnosis of COVID-19, but also for all patients admitted to the ICU and those undergoing NIMV.

Our study has some limitations. This study is single-center and limits the generalizability of the results as the study sample could not be representative of all COVID-19 patients. In addition, only anxiety and depression in the first 24 h of admission to the ICU were measured. Thus there is a need for longer term studies to investigate changes over time and treatment responses. Furthermore, this study was not capable of determining a causal relationship between anxiety or depression and socio-demographic and clinical variables.

Conclusion

In this cohort, the anxiety rate in the first 24 h of admission in COVID-19 patients who were admitted to the ICU and underwent NIMV was 37.1% while the depression rate was found to be 43.6% as measured by the HADS tool. Advanced age and high APACHE scores were associated with lower anxiety and depression. These data suggest that clinicians should screen acute patients with COVID-19 for anxiety and depression, both at initial assessment and during follow-up, and should be aware of the risk of acute stress disorder or post-traumatic stress disorder as patients recover from their acute illness.

Declarations

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