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Article

The Outcome of the Psychological and Therapeutical Cares of Hospitalized COVID-19 Patients: National African Pilot Study

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Abstract: Introduction: Hospitalization in a COVID-19 unit represents a significant source of stress and psychological distress for patients. Our study aims to determine the factors of psychological distress in the therapeutic and psychosocial management of patients hospitalized with a COVID-19 infection. **Methods:** This cross-sectional study was carried out over 8 months at the COVID-19 zone of the CHU HASSAN II of FES. 99 patients were evaluated within days of diagnosis by psychometric scales of anxiety, depression, and post-traumatic stress. In the course of this follow-up, we found the presence of psychological impacts in these patients, and we tried to find correlating factors between the occurrence of psychiatric disorders and the set of factors related to sociodemographic data, hospitalization course and treatments taken, as well as family support. **Results:** 35% of patients had scores in favor of post-traumatic stress disorder, 37% of the patients had definite depression and 50% had anxiety. Post-traumatic stress, depression, and anxiety were correlated with sociodemographic factors, hospitalization, treatments received, and length of stay. **Conclusion:** The prevalence of anxiety-depressive disorders and post-traumatic stress disorder was high in patients with COVID-19, hence the interest in providing psychological and psychosocial care in the emergency department.

Keywords: anxiety; depression; post-traumatic stress; hydroxychloroquine; family support; intensive care

Introduction

The pandemic of the coronavirus disease (COVID-19) spread rapidly around the world from January 2020, confining entire populations, filling hospitals overflowing by massive arrivals of patients with severe forms of the disease, and resulting in a dramatic increase in mortality within the care services themselves. The indirect mental health issues of such a pandemic are at least twofold: the potential psychological impact of quarantine on the general population and on vulnerable individuals, especially those with mental disorders [1] and the impact on caregivers.

Various reported papers over the world have studied the stress patterns, the psychological and physical impact of COVID-19 illness on patients including depression, lack of control, anxiety, insomnia, symptoms of post-traumatic stress disorder, sensory overload, sadness, confusion, tension, and loss of control.

Mental health issues still constitute a major concern in Morocco during COVID-19 pandemic. However, there is no epidemiological data on mental health issues raised by COVID-19 outbreak of COVID 19 and lockdown in Morocco.

This study targeted on one hand to categorize the psychiatric disorders found in hospitalized patients following COVID-19 infection and the other hand the analysis of the relationship between

hospitalization, therapeutic and psychosocial management and the occurrence of psychiatric disorders.

Methods

A cross-sectional study was conducted over a period of 9 months from 01 May 2020 to 31 January 2021. We recruited COVID-19 positive patients who were hospitalized in health institutions (Hassan II University Hospital and Ibn Khatib Regional Hospital). All participants agreed to participate after a detailed explanation of the study objectives and procedure.

Given the lack of adequate opportunities to conduct face-to-face interrogations, a digital approach using a standardized online form was used to collect information about socio-demographic and anamnestic data about the illness and its therapeutic and psychosocial management. During the same interview, patients' symptoms were recorded using two standardized scales including the HADS scale and the PTSD Checklist version DSM 5.

Subjects over 18 years of age were included and we excluded intensive care patients, patients under 18 years of age, and non-consenting patients.

The study was reviewed and approved by the local ethics committee and conducted in accordance with international ethical standards.

The statistical analysis was performed using Epi-Info software 2003 and SPSS software (version 17). Classical parametric tests including Khi2 test, Student's test, and ANOVA; and non-parametric tests. Logistic regression and linear regression models were used to establish the factors that are mostly associated with depression, anxiety and post-traumatic stress disorder by adjusting for potential confounder. The significant statistical threshold was considered for p-values less than 0.05.

Results

In this study, 99 patients were recruited. The mean age of our sample was 32 +/- 8,036, the predominance of female at 55,6%. Half of our patients were single (50,5%), while 41,1% were married, 2% were separated and 6,1% were widowed. 95,9% of them were in school. Also, 64% of our patients had a regular job. Almost all lived in urban areas and 87% lived alone while 9% lived in a shared flat while 4% lived with family.

74% of our patients received treatment, of which 51,5% were put on Plaquenil. In addition, 60% of our patients experienced psychiatric side effects to hydroxychloroquine, thus among them 23,7% presented an anxiety, 42,1% sleep disturbances, 5,3% experienced perceptual disturbances and 29% of somatic disorders (diarrhea and vomiting).

Our patients were allocated to medical and intensive care units according to their state of health, based on several criteria, the most important of which was: oxygen saturation. 60% of our patients were hospitalized in a medical service, 22% of our patients were admitted to an intensive care unit and the remaining 18% were cared for at home with daily telephone monitoring. We find that the average length of hospitalization was estimated at 8 days.

The psychiatric assessment using scale scores found that 35% of patients had scores in favor of post-traumatic stress disorder, 37% of patients had definite depression, and 50% had anxiety.

We find a highly significant relationship between taking psychiatric treatment and Plaquenil as well as the viral/contamination status of relatives also represented clinical risk factors for the occurrence of post-traumatic stress disorder in our patients (Table 1). Regarding the hospitalization of our patients three factors seem to have an impact on their psychological status: patients who did not share their hospital rooms with other patients were more likely to develop post-traumatic stress disorder ($p=0,028$). The inpatient department was the most important risk factor in our series and patients who stayed in intensive care were much more vulnerable to psychological distress ($p=0,000$). We also find the length of hospitalization of our patients seems to have a significant impact on the occurrence of psychological disorders ($p=0,001$).

Table 1. factors statistically associated with post-traumatic stress.

POST-TRAUMATIC STRESS				
		No (64,6%)	Yes (35,5%)	P value
Age				
	< 40 years	76,05%	23,94%	P= 0,001
	> 40 years	35,71%	64,28%	
Sex				
	Men	63,6%	36,3%	P=0,002
	Women	65,1%	34,8%	
Marital status:				
	Married	53,6%	46,3%	
	Divorced	0%	100%	P=0,016
	Single	78%	22%	
	Widower	50%	50%	
Grade Level:				
	Never attended school	0%	100%	
	Primary	40%	60%	P=0,024
	Secondary	71,4%	28,5%	
	University	68,1%	31,8%	
Professional activity				
	Regular	66,6%	33,3%	
	Irregular	33,3%	66,6%	P=0,025
	Absent	66,6%	33,3%	
Treatment received				
	Plaquenil	52,9%	47,05%	P=0,012
	Other	77,08%	22,9%	
Psychiatric side effects of hydroxychloroquine				
	Sleep disorders	87,5%	12,5%	P=0,267
	Anxiety disorders	55,5%	44,4%	
	Perceptual disorders	100%	0%	
	Other	72,7%	27,2%	
Cohabitation				
	Yes	77,5%	22,5%	P=0,028
	No	55,9%	44,06%	
Family support				
	Yes	65,7%	34,2%	P=0,665
	No	60,8%	39,1%	

Information about the disease	69,6%	30,3%	P=0,137
Yes	54,5%	45,4%	
No			
Inpatient department			
Intensive care	13,6%	86,3%	P=0.000
Medical	77,9%	22,03%	
Other	83,3%	16,6%	
Length of hospital stay			
≤ 15 days	16,2%	83,7%	P=0,001
>15 days	50%	50%	

For the course of the hospitalization, only the hospitalization department represented a risk factor for the onset of depression with a highly significant relationship ($p=0,001$): patients who stayed in intensive care were a greater risk of developing signs depression clinics. (Table 2)

It has also been found that the intake of Plaquenil by some of our patients was considered to be a risk factor for the onset of anxiety. ($p=0,021$) (Table 3)

Table 2. factors statistically associated with depression disorder.

	DEPRESSIVE DISORDER			P value
	Absence of symptomatology	Questionable symptomatology	Certain symptomatology	
	(60,6%)	(2%)	(37,4%)	
Age				
< 40 years	74,64%	1,4%	23,94%	P= 0,001
> 40 years	25%	3,5	71,42%	
Marital status:				
Married	34,14%	5%	61%	P=0,001
Divorced	50%	0%	50%	
Single	84%	0%	16%	
Widower	50%	0%	50%	
Grade Level:				
Never attended school	0%	25%	75%	
Primary	20%	0%	80%	P=0,001
Secondary	81%	5%	14%	
University	60,8%	0%	39%	
Treatment received				
Plaquenil	37,2%	4%	58,8%	P=0,001
Other	85,4%	0%	14,5%	

Psychiatric effects of hydroxychloroquine	75%	0%	25%	P=0,267
Sleep disorders	55,5%	0%	33,3%	
Anxiety disorders	0%	0%	100%	
Perceptual disorders	72,7%	0%	36,3%	
Other				
Cohabitation				
Yes	72,5%	0%	27,5%	P=0,097
No	52,5%	3%	44%	
Family support				
Yes	59%	2,6%	38%	P=0,682
No	65%	0%	34,7%	
Information about the disease				P=0,590
Yes	60%	3%	36,5%	
No	60,5%	0%	39,5%	
Inpatient department				
Intensive care	13,6%	9%	77%	P=0.001
Medical	69,5%	0%	30,5%	
Other	89%	0%	11%	
Length of hospital stay				P=0,318
≤ 15 days	79,06%	0%	20,93%	
>15 days	46,42%	3,5%	50%	

Table 3. factors statistically associated with anxiety disorder.

	ANXIETY DISORDER			P value
	Absence of symptomatology (39,4%)	Questionable symptomatology (11,1%)	Certain symptomatology (49,5%)	
Age				
< 40 years	46,47%	12,6%	40,84%	P= 0,007
> 40 years	21,43%	7,14%	71,42%	
Treatment received				
Plaquenil	27,4%	7,8 %	64,7%	P=0,008
Other	52%	14,5%	33,3%	

Psychiatric side effects of hydroxychloroquine	31%	19%	50%	P=0,699
Sleep disorders	22,2%	33,3%	44,4%	
Anxiety disorders	0%	50%	50%	
Perceptual disorders	45,5%	9%	45,5%	
Other				
Cohabitation				
Yes	50%	15%	35%	P=0,058
No	32%	8,5%	59,3%	
Family support				
Yes	42%	10,5%	47,3%	P=0,603
No	30,4%	13%	56,5%	
Information about the disease				
Yes	36,3%	9%	54,5%	P=0,331
No	45,5%	15%	39,4%	
Inpatient department				
Intensive care	4,5%	4,5%	90,9%	P=0.001
Medical	45,7%	15,2%	39%	
Other	61%	5,5%	33,3%	
Length of hospital stay	51,16%	13,9%	34,8%	P=0,014
≤ 15 days	30.3%	8,9%	60,7%	
>15 days				

In addition, the only criteria regarding hospitalization that was found to have a significant relationship with the high scores of anxieties in our study was actually the hospitalization department: the stay in an intensive care unit seems to have a highly anxiety-inducing impact on our patients ($p=0,001$), and the duration of hospitalization ($p=0,014$): the longer the duration of hospitalization, the greater the psychological damage. (Table 3)

Discussion

In the present study, we targeted exploring the prevalence and factors associated with the onset of anxiety, depressive, and disorders symptoms supporting post-traumatic stress disorder in hospitalized patients with COVID-19. This study might further enhance the awareness on psychological states of this category of COVID-19 patients and provide required psychological treatment, support and interventions which would allow improving the mental and physical health of patients during this pandemic.

Approximately 37,4% of our patients had depression with definite symptomatology. The findings are consistent with the results of previous studies, in particular that of Xiangyu Kong and Al in China, which found scores suggesting depression in 28,47% of patients with COVID 19 [2], and also that of Mario Gennaro Mazza and Al in Italy which found an estimated prevalence of 30% [3] as well as that of Jie Zhang and Al, in China which found an estimated prevalence of 29,2% [4].

In our study, we found a sharp rise in anxiety levels in patients with COVID 19 with an estimated prevalence of 49,5%. These results are consistent with the results of previous studies, especially those of the systematic review by Y. Krishnamoorthy, et al. (5) in India, based on three studies of anxiety disorders in patients with COVID 19, with an estimated prevalence of 37%, Xiangyu Kong et El [2] also found traits of anxiety in approximately 34,72% of patients with COVID 19. The figures from Mario Gennaro Mazza and Al [3] conducted in Italy were the highest in terms of anxiety with an estimated prevalence of 40%. These results oppose those of Jie Zhang and Al [4], who found an estimated prevalence of anxiety of 15% in the ranks of COVID 19 positive patients.

In our series, the prevalence of acute and post-traumatic stress was estimated at 34,7%. These results agree with the data in the literature, in particular those of the study by Mario Gennaro Mazza in Italy [3], which found a prevalence of post-traumatic stress disorder estimated at 28% in the ranks of positive patients with COVID 19. This figure was significantly higher in the study by Y. Krishnamoorthy et al. who found a prevalence of post-traumatic stress disorder estimated at 96%.

According to French study conducted by Philippe Garcia and al [6] at Toulouse University Hospital [6] on the psychiatric side effects of hydroxychloroquine in 1756 European and Moroccan patients, 56 patients presented with psychiatric disorders, 28 of which presented with a critical disorder leading 4 suicide attempts within 4 days of starting treatment, 3 patients presented with self-harm. In the same series, 12 cases of psychotic disorders were found mainly associated with visual hallucinations, agitations and aggressions.

The study of Biswas and al. [7] found that the most frequently psychiatric manifestations are depersonalization, derealization and affective disorders [76.2% of cases]. The most common mood change symptom was irritability. This study also demonstrated that the duration of psychotic episodes was prolonged with an average duration of 29.62% days after stopping treatment. These results are consistent with those of the Bhatia MS study [8].

In our study, taking hydroxychloroquine represented one of the most significant factors in terms of the onset of psychological distress in our patients: this intake was correlated with a high rate not only of post-traumatic stress [$p=0.012$], of depression [$p=0.001$] and anxiety [$p=0.008$], but also sleep disorders and mainly visual perceptual disorders.

Our study showed no significant relationship between family support and the occurrence of psychiatric side effects. Our results disagree with a Chinese study conducted by Kong and al. [2] which shows that the anxiety and stress levels of positive COVID 19 patients are significantly dependent on family support [$p < 0.01$]

Our study found no link between the information received about the illness and the occurrence of acute stress, depression or anxiety. In contrast, the study conducted in Iran by Amir Mansourieh and al. [9] showed that the more people followed the news of the coronavirus, the more the level and severity of their anxiety increased with a highly significant relationship [$p < 0.01$].

Hospitalization service was discussed exclusively in our study, which revealed that the inpatient department was the most important risk factor for the onset of psychiatric disorders during or after illness [$p=0,001$]. Several explanations have been found: the experience of aggression on the body: care and replacement procedures save patients' lives but they also represent very cumbersome, invasive and painful techniques. They can be experienced as violent and frightening creating a state of uncertainty in the sense of bodily integrity. This attack of bodily limits can be distressing and very anxiety-provoking. According to a French study conducted by Pochard and al [10] at the CHU of Paris on the evaluation of the psychological consequences of a stay in intensive care, the stress factors during a stay in intensive care are numerous (pharmacological, metabolic, noise, light, pain, difficulties or inability to understand and communicate, etc.), and the prevalence of anxiety, depressive, delusional or confusional symptoms is not only major [11,12]. But can increase morbidity

and mortality extubation, accident during an episode of agitation, respiratory decompensation during a panic attack, premature exits, etc.). these disorders, sometimes trivialized, sometimes treated inappropriately, represent patient suffering in the same way as physical pain.

The stressful context experienced during the ICU stay can also be ultimately (in the months or years following discharge) responsible for psychiatric symptoms seriously hampering the quality of life: many ICU survivors have traumatic memories after their stay such as nightmares, acute anxiety [13] or pain, which may be associated with the onset of post-traumatic stress disorder [14]. These symptoms can have significant consequences on somatic morbidity, but also on the relational, emotional and social life of patients.

Length of stay in hospital has not been widely discussed in the literature, however, in our study we found a significant relationship between the length of stay in hospital and psychological distress: patients whose length of stay in hospital over 15 days were more likely to develop post-traumatic stress disorder [$p= 0,001$] and anxiety [$p= 0,014$], however no correlation was found between this parameter and depression.

Limits of the work: The number of patients included remains moderate if we consider the total number of patients with COVID 19. But this is due to the difficulties of conducting interviews patients, non-cooperation, and also the limits of access and availability of digital resources.

Conclusion

Our results showed a high prevalence of anxiety-depression and post-traumatic stress disorders in these patients. These disorders were also correlated with certain socio-demographic factors independently of the characteristics of the disease. These results suggest that psychosocial support should be offered to patients in order to optimize medical management during this pandemic period.

Psychological and medical management may be necessary for those at risk of developing psychological reactions beyond the normal range. Further research should focus on the needs and expectations of patients, beyond the diagnostic phase and throughout the treatment stages.

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Availability of Data and Materials: The data supporting the results of this study are available in open access at the request of the reviewers. The authors confirm that the data supporting the results of this study are available in the article and its supplementary materials.

Conflict of Interest: the authors declare that they have no conflict of interest.

Ethical Approval: All subjects gave their informed consent before participating in the study. The study was conducted in accordance with the Declaration of Helsinki. The local research ethics committee of the Faculty of Medicine and Pharmacy in Fez (Morocco) has given its ethical approval to the study presented by the head of the Department of Psychiatry, Professor AALOUANE Rachid

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