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Original Research Article

Post COVID health effects on patients discharged from tertiary COVID care hospital of Southern Rajasthan, India: a cross-sectional study

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ABSTRACT

Background: The World Health Organization declared the 2019-20 Coronavirus outbreak a public health emergency of international concern on 30th January 2020 and a pandemic on 11th March 2020. It has been creating havoc and a sense of serious insecurity and panic like situation. After recovery patient remain at risk of lung disease, heart disease, and mental health disorders. There have been long term sequelae of adverse effects. This study is being conducted as of now there is limited evidence of post-COVID sequelae as well as the initial psychological impact of COVID-19 is known and further research is required in this topic.
Methods: Cross-sectional study was conducted on patients of a teaching hospital in south Rajasthan. Along with socio-demographic proforma, impact of event scale-revised (IES-R Scale) was used to collect the sociodemographic details and psychological impact on patients after they recovered from the disease. Chi-square test was used to find out statistical significance.
Results: A total of 153 patients were taken for analysis. Fever followed by breathing difficulty was found to be most common post COVID physical symptoms. IES-R scale had significant associations with age group, co-morbid condition, smoking and alcohol intake.
Conclusions: During the initial phase of pandemic, India presented with a high prevalence of post COVID health effects along with a psychiatric sequela. Considering this as an alarming impact, it is suggested to routinely monitor the patients even after discharge from the hospitals.

Keywords: Post COVID effects, Discharged patients, COVID care hospital

INTRODUCTION

SARS-CoV-2 or COVID-19 pandemic outbreak has been creating havoc and has imposed a sense of severe insecurity and panic like situation.[1] The mass media/telecommunications/newspaper/blogs have been updating the information about the rapid rise in cases leading to admission to the hospital, being kept in isolation ward, requiring oxygen support, being admitted in intensive care units (ICUs), associated mortality and fate of the dead bodies (packaging/ filled up graveyards/ crematorium).[2] All this news has led to a significant fear, anxiety, uncertainty, and restlessness in general public. In this background, when one is diagnosed with COVID-19 infection, the diagnosis brings in a feeling of shock and disbelief, and a feeling in a death bed.[3] Respiratory viral diseases are associated with both acute and long-lasting psychological consequences in the survivors. Coronaviruses are negatively stranded RNA viruses, which cause infection ranging from common colds to severe acute respiratory syndrome.[4]Coronavirus exposure has been implicated in neuropsychiatric disease during and after severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) outbreaks.[5] SARS survivors reported psychiatric symptoms, including post-traumatic stress disorder (PTSD),

depression, panic disorder and obsessive compulsive disorder (OCD) at 1 to 50 months of follow up.[6] The recent spreading of the Severe Acute Respiratory Syndrome Coronavirus (COVID-19) pandemic seems yet to be associated with psychiatric implication.[7] Preliminary data suggest that patients with COVID-19 might experience delirium, depression, anxiety, and insomnia.[8] Coronaviruses could induce psychopathological sequelae through direct viral infection of central nervous system (CNS) or indirectly via an immune response.[9]Clinical, post-mortem, animal, in vitro, and cell culture studies demonstrated that Coronavirus are potentially neurotropic and can induce neuronal injuries.[10] Notwithstanding possible brain infiltration, "cytokine storm" involved in the immune response to Coronavirus may cause psychiatric symptoms by precipitating neuro-inflammation.[11] Taking into account the sparse preliminary studies on COVID-19 and considering the previous evidence about SARS and MERS outbreaks, we hypothesize that COVID-19 survivors will show a high prevalence of emergent psychiatric conditions like PTSD, mood disorders etc. Hence this study attempted to find the initial psychological impact of COVID-19 among the general public; and understand its relationship with physical symptoms. This can potentially help the policy makers in formulating comprehensive interventions.

Objectives

Objectives of current study were to analyse patient's socio-demographic and clinical variables related to COVID-19, to find out different post-COVID physical health effects, to measure overall psychological impact by using IES-R scale instrument and to find out association of clinical parameters with psychological impact

METHODS

A cross-sectional study was conducted among the patients of age >18 years with confirmed COVID-19 infection i.e., positive reverse transcriptase polymerase chain reaction (RT-PCR) assay of nasal/oro-pharyngeal swabs who were admitted at designated COVID-19 setup in Jhalawar district of Rajasthan. The study was conducted after getting ethical approval from the institutional ethical committee in October 2020 to December 2020.

Sample size

Complete enumeration of study population was considered as a sample size. All study participants were included in our study during study period that fulfil our inclusion exclusion criteria. Finally, 153 study population were selected.

Selection criteria

The study participants were of age >18 years with confirmed COVID-19 infection who gave consent for the study. The study excluded those patients who refuse to give their consent to participate in this study, patients with communication impairment, long term hospitalization or those with baseline dementia which can be assessed by looking on the medical history and when the patient will unable to articulate the purpose of the study even after making him understand.

Data collection

Data was collected from the hospital register after getting the permission from the dean and medical superintendent (MS) of the medical college. Patients were approached on the 7th day post discharge telephonically and informed about the nature and purpose of the study. They were asked about their detailed socio-demographic profile like age, gender, marital status, any history of contact with positive cases, presenting symptoms during admission into the hospital and any associated co-morbid conditions. A predesigned socio-demographic proforma was used to get the above information. The second part of the survey was adopted for asking detailed about the post-COVID health effects if any, observed 7 days post discharge. For measuring psychological impact, impact of event-revised (IES-R) scale was used. This tool (IES-R) comprised of 22 item questionnaire which measure the effect of everyday trauma and stress after an event. For all questions, scores could range from 0 through 4. Categorization of scores ranges from 24 to 32, 33 to 36 and more than 37 which will signify mild, moderate and severe psychological impact respectively. Among this scale, the intrusion subscale is mean item response of items 1, 2, 3, 6, 9, 14, 16, 20. The avoidance subscale is the mean item response of items 5, 7, 8, 12, 13, 17, 22. The hyperarousal subscale is the mean item response of items 4, 10, 15, 18, 19, 21.

Statistical analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS trial version 23). Descriptive statistics were conducted for the socio-demographic and clinical parameters (like physical symptoms and contact history etc). The scores of IES-R and subscales were expressed as mean and standard deviation. We used Pearson Chi-Square to test the relationship between socio-demographic characteristics, physical symptoms, contact history, additional information variables and IES-R score. If expected number in the cell was below 5 in a table, Fisher's Exact test was used.

RESULTS

We screened 348 COVID-19 discharges identified through the electronic health record. Of these, 62 were deemed ineligible. Of the remaining 286 eligible discharges, 46 could not be reached, 58 declined to participate, 28 were re-hospitalized and too sick to participate, so final study sample of 153 was obtained. A total of 153 patients were included in the study, of which 85 (55.6%) were males and 68 (44.4%) were females.

Respondents were categorised into three age-groups. Most of the patients (53%) belonged to the age group 18-44 years, 24.2% belonged to 45-60 years and 22.8%. 12.4% of the respondents were healthcare professionals, 62.1% were married, 5.2% were having contact history with persons with COVID-19 infection, 30.7% were having co-morbid conditions like hypertension (12.2%), diabetes mellitus (6.4%), obesity (9.8%), asthma and other respiratory conditions (2.3%) (Table 1).

Table 1: Socio-demographic and clinical parameters.

Variables		N (%)
Age group (years)	18-44	81 (53)
	45-60	37 (24.2)
	> 60	35 (22.8)
Gender	Male	85 (55.6)
	Female	68 (44.4)
Health professionals	Yes	19 (12.4)
	No	134 (87.6)
Marital status	Married	95 (62.1)
	Single	41 (26.8)
	Widow	6 (3.9)
	Widower	11 (7.2)
Contact history	Yes	8 (5.2)
	No	145 (94.8)
Co-morbid condition	Yes	47 (30.7)
	No	106 (69.3)
Oxygen support	Required	43 (28.1)
	Not required	110 (71.9)
ICU admission	Required	25 (16.3)
	Not required	128 (83.7)
Smoking	Current/Former	46 (30)
	Non-smoker	107 (69.3)
Drinking alcohol	Current/Former	41 (26.7)
	Not drinking	112 (73.2)

Table 2: Post COVID physical symptoms.

Post COVID physical symptoms	N	%
Sore-throat	13	8.4
Presence of cough	12	7.8
Headache	17	11.1
Fever	19	12.4
Breathing difficulty	64	41.8
Fatigue	17	11.1
Myalgia	11	7.1

All patients were enquired for post COVID physical and psychological symptoms after discharge from the hospital. Fever was the most commonly encountered post COVID physical symptom with 41.3%, followed by breathing difficulty in 19 (12.4%), fatigue and headache in 17 (11.1%), sore-throat in 13 (8.4%), presence of cough in 12 (7.8%) and myalgia in 11 (7.11%) of patients discharged (Table 2). Psychological impact was with respect to COVID-19 outbreak was measured using IES-R scale, revealed most of the respondents, 62 had mild psychological impact with IES-R score of 25-32. Around 42 patients had minimum psychological impact to COVD infection and 15 in moderate impact category. Around 28 patients reported severe impacted category with IES-R score >36 (Table 3, Figure 1).

Table 3: Frequency and percentage distribution of psychological impact in response to COVID-19 outbreak (n=153).

Categories	N	%
Minimal (0-23)	42	27.5
Mild (24-32)	68	44.4
Moderate (33-36)	15	9.8
Severe (>36)	28	18.3

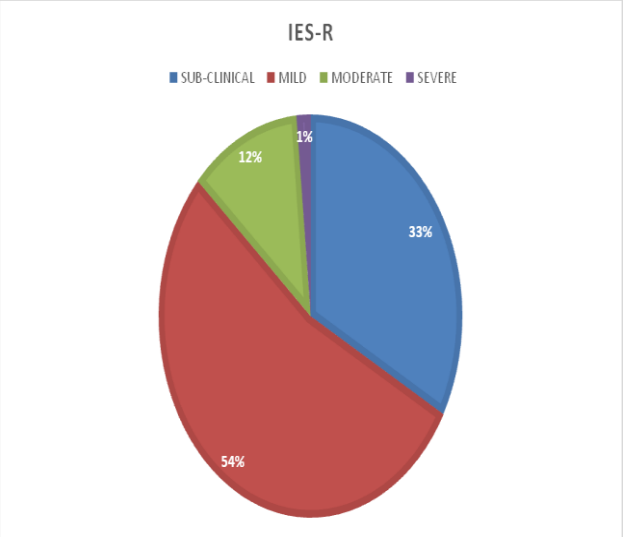

Figure 1: Pie-chart showing IES-R scale.

Table 4: Association of age with psychological impact in response to COVID-19 outbreak.

Age group (years)	Post COVID IES-R scale				P value
	Minimal	Mild	Moderate	Severe	
	18-44	56	87	99	0.012
	45-60	57	97	88	
	>60	98	90	89	

Association of psychological impact with clinical parameters

Association of IES-R scale with various socio-demographic variables like age (Table 4), co-morbid conditions (Table 5), smoking (Table 6) and alcohol intake (Table 7) were found out using chi-square test and found out to be significant.

Table 5: Association of co-morbid condition with IES-R scale.

Co-morbid condition		Post COVID IES-R scale				P value
		Minimal	Mild	Moderate	Severe	
	Yes	5 (10.6)	16 (34)	6 (12.8)	20 (42.6)	0.0001
	No	37 (34.9)	52 (49.1)	9 (8.5)	8 (7.5)	

Table 6: Association of smoking with IES-R scale.

Smoking		Post COVID IES-R scale				P value
		Minimal	Mild	Moderate	Severe	
	Current	6 (35.3)	8 (47.1)	0	3 (17.6)	0.011
	Former	6 (20.7)	7 (24.1)	3 (10.3)	13 (44.8)	
	Never	24 (26.4)	47 (51.6)	10 (11)	10 (11)	
	Unknown	6 (37.5)	6 (37.5)	2 (12.5)	2 (12.5)	

Table 7: Association of alcohol intake with IES-R scale.

Drinking alcohol		Post COVID IES-R scale				P value
		Minimal	Mild	Moderate	Severe	
	Current	7 (41.2)	7 (41.2)	0	3 (17.6)	0.013
	Former	6 (23.1)	6 (23.1)	2 (7.7)	12 (46.2)	
	Never	24 (26.7)	45 (50)	10 (11.1)	11 (12.2)	
	Unknown	5 (25)	10 (50)	3 (15)	2 (10)	

DISCUSSION

In our prospective single health system observational cohort study examining post-discharge outcomes of patients hospitalized for severe COVID-19, we found that patient and typically did not have shortness of breath prior to hospitalization for COVID-19. However, almost three quarters of patients reported persistent shortness of breath post-hospital discharge. Shortness of breath that existed prior to COVID-19 exacerbated in severity, frequency, and duration following COVID-19. Furthermore, both physical and mental health were not regarded as good. Even after being discharged from the hospital, the patient's condition was same as before.

Individual patients with COVID-19 effects lasting for several years have been mentioned in studies like that of by Parshley, D'Ambrosio, Belluck P.[12-14] According to one study[15] 35% of non-hospitalized COVID-19 patients did not return to their typical state of health 2-3 weeks following diagnosis. Our findings show that the vast majority of individuals with COVID-19 sickness take a long time to recover. The world health organization estimates that the median time from onset of disease to recovery of severe COVID-19 is about 3-6 weeks, based on early data from China.[16] Recent research from Italy, which looked at post-discharge outcomes, found that 43 percent of patients had persistent dyspnoea two months following symptom start.[17] In our study many of the patients were admitted to ICU and were serious with presence of co-morbidities which explains the reason of higher incidence of breathing difficulty.

This has major ramifications for the ability to return to work, as well as downstream mental health effects from often drastic lifestyle and work capacity changes (most notably breathing difficulty) and the ability to engage in activities or hobbies loved previous to COVID-19 sickness. This results in psychological impact, which is assessed in our study by using IES-R scale. Overall, among the 153 respondents 72.5% had (mild/moderate/severe) psychological impact regarding COVID-19. This finding in the study is comparable with the study conducted in China by Wang et al which reported 53.8% of respondents suffered from a psychological impact from the present outbreak, ranging from moderate to severe among 1210 respondents studied. Contracting the virus is likely to be associated with fear of becoming ill, helplessness, hopelessness, stigma, and possibly death.

During an outbreak, providing psychological first-aid and counselling is critical. It aids in the reduction of psychological discomfort and the promotion of adaptive coping skills for dealing with it. Despite the efforts of WHO and other public health authorities to contain the COVID-19 outbreak, this time of crisis is generating stress throughout the country, much alike its impact on the global counterparts.[18] Providing continuous mental and emotional support to various groups during the outbreak should be a top focus. Clinical variables showcase those patients with co-morbid conditions have more psychological impact of COVID-19 outbreak as compared to the ones with no comorbidities. This was found to be statistically significant. These findings were similar in the study conducted by Weerahandi et al a

greater psychological impact of due to the Coronavirus outbreak.[19] These patients are at risk for due to the high incidence of intensive care unit stays and protracted hospitalizations associated with these cases. Individuals with COVID-19 were also more likely to be comorbid than the general population, with a higher prevalence of previous hospital admissions and all pre-existing conditions (most notably hypertension, major adverse cardiovascular events, respiratory disease, and diabetes) than the general population. In our survey, demographic variables like smoking habits and alcohol intake had statistically significant association with the psychological impact. This is comparable with the study made by Varshney et al.[20] It is found that smoking and drinking alcohol are considered as much a stress reliever, social activity or hobby for all group of population. These habits weaken the body's immune system, making it less able to cope with infectious diseases.

Limitations

Imitations of current study were time bound and only spanned for three months. There was a need to counsel patients about the post COVID health consequences. The response from patients who died and were not psychologically active to respond could not be obtained.

CONCLUSION

When compared to similar persons in the general population, those discharged from hospital following acute COVID-19 had a higher risk of mortality, readmission, and multiorgan dysfunction, and the relative increase in risk was not limited to the elderly or uniform across ethnic groups. Post-COVID effects exacerbate current healthcare challenges, particularly the need for long-term high-quality care: inequalities in health, access, and provision; incomplete pathways between community and hospital care; and the need to translate research into clinical practise with adequate resources. Integrated care pathways, which have been shown to be effective in the treatment of other conditions such chronic obstructive pulmonary disease, could be useful in the treatment of post-COVID effects.

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