ORIGINAL ARTICLE

Effect of the Coronavirus Disease-19 Pandemic on Mental Health of Positive Patients and Suspects: A Cross-sectional Study

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ABSTRACT

Background: Coronavirus disease 19 (COVID-19) pandemic is affecting human beings all over the world in many unprecedented ways, which include not only physical health but also mental health. **Objective**: We did a case control study to see the impact of the disease in mental health status of suspected and positive COVID-19 patients. **Materials and Methods:** A total of 49 suspected COVID-19 patients and 70 controls were selected over a period of 1 month using the inclusion and exclusion criteria of the study. Basic demographic characteristics were noted and all participants were subjected to Hamilton Depression Rating Scale. **Results:** Among the case cohort, 42.85% of patients had symptoms of depression. Out of these 49 patients, 11 were finally confirmed positive by Reverse transcription polymerase chain reaction and all of these had clinical depression. In the control cohort, 1.42% had depression. **Conclusion:** The number of patients subjected to mental stress far exceeds the number infected by the virus itself. We elucidated by this study that suspected COVID-19 patients also form an important vulnerable subgroup which is psychologically impacted by the pandemic; hence, due attention should also be given on their mental well-being as well.

KEY WORDS: Coronavirus disease-19, depression, mental health.

Introduction

The emergence of coronavirus disease 19 (COVID-19) pandemic has affected the mankind in various ways. The virus has crossed regional, racial, and international borders causing marked morbidity and mortality.

Till date (June 11, 2020) over 7,273,958 cases have been confirmed and 413, 372 deaths have been attributed to this disease across 216 countries.[1] By the same time, our country has 284,036 confirmed cases and 8498 deaths.[1]

To curtail the spread of COVID-19 transmission, stringent infection control measures including mandatory isolation of cases, quarantine of contacts physical distancing, and population-level movement restrictions " lockdown" have been implemented.

India has recently observed a rising trend in mental disorders; the proportional contribution of mental disorders to total disease burden has doubled from 1990 to 2017.[2] In the backdrop of this rising mental disorder, the occurrence of a pandemic of this magnitude may further negatively impact the mental health status of population.

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Several pandemics have occurred in history but studies regarding their impact on mental status are limited. Few studies done in epidemics of severe acute respiratory disorder and severe acute respiratory syndrome (SARS) have highlighted the impact of these diseases on mental health. There had been a 30% increase in suicide in age group above 65 and a 50% increase in anxiety related disorders in recovered patients after severe acute respiratory disorder epidemic in 2003.[3,4] These studies pave the way for complete health preparedness which definitely includes mental health, for future pandemics.

We tried to elucidate the impact of this virus on the mental health of suspected and positive COVID-19 patients.

Materials and Methods

Participants

This descriptive cross-sectional study was done in Maharshi Vashishtha Autonomous State Medical College and associated Kailly hospital, Basti, Uttar Pradesh, India, after taking ethical clearance from the concerned department. It included 119 participants over a period from April 20, 2020, to May 20, 2020. Cases, for the purpose of this study, were suspected COVID-19 patients who were defined as symptomatic patients (history of Fever, cough, and sore throat) with history of travel from COVID-19 zones in the past 14 days, history of contact with COVID-19 infected person or history of participation in large social or religious gatherings as per the guidelines given by Indian Council of Medical Research.[5] As per this criteria, we had 49 cases. They were quarantined in the hospital and their sample was sent for confirmation of COVID-19 as per the same guidelines. Among control group, 70 patients who attended the same hospital for ailments other than respiratory tract infection were included in the study.

Informed consent was taken from all the subjects before commencement of study. All participants were interviewed during hospital stay after ensuring adequate physical distance. Data were collected on a predesigned pro forma which included basic characteristics and assessment of depression as per Hamilton Depression Rating scale.

Hamilton depression rating scale (Ham-D)

The Hamilton Depression Rating Scale (HAM-D) is most widely used clinician administered depression assessment scale.[6] The original version has 17 items related to symptoms of depression experienced over past week. The degree of depression is rated by the accumulated scores on 17-items. Scores of 0–7 are considered as being normal; 8–16 suggest mild depression, 17–23 moderate depression; and scores over 24 are indicative of severe depression.

Statistical analysis

Statistical Package for the Social Sciences software, version 20.0 was used for statistical analysis. Means and proportions of the given data were calculated. Categorical variables were analyzed using the Pearson's Chi-square test. Continuous variables were analyzed using non-paired Student's *t*-test. Differences between groups were considered to be significant when $P < 0.05$.

Results

Demographic characteristics

A total of 119 participants, 99 male and 20 female were included in current study. Among these participants, 49 were in the case group and 70 were in the control group. The age of the study participants ranged from 18 to 65 years. Median age in case and control group was 29 and 30 years with interquartile range 13 and 17, respectively. Among case and control groups 42 males and 7 females; 57 males and 13 females were included, respectively (p.538). Lesser proportion of participants was educated up to graduate level about 14% and 15.7% among case and controls groups, respectively. Most participants were educated up to senior secondary level. Quite a large number of participants had only primary education or were illiterate. About 65.30% among cases and 67.14% among control were living with spouse. None participants were divorced or widowed. Education level and marital status among case and control groups did not yield significant difference ($P = 0.622$ and 0.835, respectively). Demographic characteristics are listed in Table 1.

Among the case group, 11 were confirmed cases of COVID-19 as per positive reverse transcriptase polymerase chain reaction reports.

Psychological characteristics of the participants

Among the case cohort, 42.85% participants had symptoms of depression. All of them were categorized into mild category. In control cohort, 1.42% of participants had features of mild depression.

Table 1: Baseline demographic and clinical characteristic of participants

Characterstic	Case	%	Control	%	Significant value
Gender					
Male	42	85.71	57	81.14	0.538
Female	7	14.28	13	18.57	
Age (years)					
≤25	16	32.7	22	31.4	0.544
26–40	23	46.9	32	45.7	
41–55	4	8.2	11	15.7	
≥56	6	12.2	5	7.1	
Marital status					
Married	32	65.30	47	67.14	0.835
Single	17	34.70	23	32.85	
Divorced	0	0	0	0	
Widowed	0	0	0	0	
Education Status					
Illiterate	6	12.24	5	7.14	0.622
Primary	5	10.20	10	14.28	
Lower secondary	7	14.28	14	20.0	
Upper secondary	24	48.97	30	61.22	
University/master	7	14.28	11	15.71	

The median and interquartile range of Hamilton depression rating scale in case cohort was 6.30 and 5.60 and for control cohort was 2.10 and 0.70.

Among the case group, median total score (interquartile range) of the above scale among male and female participants was 5.95 (5.07) and 10.50 (6.30).

Among case group median total score (interquartile range) among married and unmarried participants were 7.00 (6.82) and 5.60 (4.20), respectively.

Median total score (and interquartile range) in age groups 18–25, 26–40, 41–55, and ≥56 years was 5.25 (3.67), 6.30 (6.30), 5.60 (5.77), and 10.85 (2.80), respectively.

Median total score (and interquartile range) in education groups: Illiterate, primary, lower secondary, upper secondary, and graduate or higher were 11.90 (2.80), 7.00 (7.00), 8.40 (4.90), 5.60 (2.10), and 5.60 (0.17), respectively. The significant values of all demographic variables among cases are shown in Table 2.

Table 2: Mean rank of total score for various demographic characteristics for cases cohort

Characterstic	Mean rank	Significant value
Sex		
Male	23.62	0.095
Female	33.29	
Marital status		
Married	28.23	0.029
Unmarried	18.91	
Age group		
≤ge	18.03	0.016
26–40	26.13	
41–55	24.50	
≥4.	39.58	
Educational status		
Illiterate	41.06	0.001
Primary	27.43	
Lower secondary	29.50	
Upper secondary	18.05	
University/master	16.0	

Table 3: Mann–Whitney test of significance for HAM D 17 items and total scores among case and control group

Group	Case/ control	Mean rank	Significance (2 tailed)
Depressed mood	Case	85.22	0.000
	Control	42.34	
Feeling of guilt	Case	78.98	0.000
	Control	46.71	
Suicide	Case	60.71	0.232
	Control	59.50	
Early insomnia	Case	82.00	0.000
	Control	44.60	
Middle insomnia	Case	68.57	0.000
	Control	54.00	
Morning insomnia	Case	56.64	0.243
	Control	62.35	
work/activities	Case	79.36	0.000
	Control	46.45	
Retardation	Case	74.29	0.000
	Control	50.00	
Agigation	Case	68.88	0.007
	Control	53.79	
anxiety psychic	Case	83.64	0.000
	Control	43.45	
somatic anxiety	Case	72.79	0.000
	Control	51.05	
GI somatic	Case	81.71	0.000
	Control	44.80	
somatic general	Case	80.00	0.000
	Control	46.00	
Genital	Case	59.50	0.403
	Control	60.35	
Hypochondriasis	Case	66.43	0.000
	Control	55.50	
wt loss	Case	61.36	0.605
	Control	59.05	
HAM D Total score	Case	90.85	0.000
	control	38.41	

Table 4: Mann-Whitney test of significance for HAM D 17 items and total scores in negative vs positive among case group

Group	Non Infected/ infected	Mean rank	Significance (2 tailed)
Depressed mood	Non-infected	21.29	0.000
	Infected	37.82	
Feeling of guilt	Non-infected	22.39	0.006
	Infected	34.00	
Suicide	Non infected	24.50	0.063
	Infected	26.73	
Early insomnia	Non-infected	22.97	0.018
	Infected	32.00	
Middle insomnia	Non-infected	20.29	0.000
	Infected	41.27	
Morning insomnia	Non-infected	25.16	0.837
	Infected	24.45	
Work/activities	Non infected	23.18	0.045
	Infected	31.27	
Retardation	Non-infected	20.80	0.000
	Infected	39.50	
agitation	Non infected	22.39	0.004
	Infected	34.00	
Anxiety psychic	Non-infected	24.05	0.233
	Infected	28.27	
Somatic anxiety	Non-infected	21.45	0.000
	Infected	37.27	
GI somatic	Non-infected	24.13	0.164
	Infected	28.00	
Somatic general	Non infected	22.37	0.006
	Infected	34.09	
Genital	Non-infected	25.00	1.00
	Infected	25.00	
Hypochondriasis	Non-infected	22.43	0.000
	Infected	33.86	
Wt loss	Non infected	22.08	0.000
	Infected	35.09	
HAM D total score	Non-infected	19.72	0.000
	Infected	43.23	

Severity of depression in COVID-19 infected cases

Among case group, 77.55% and 22.44% of participant were COVID-19 infected and non-infected, respectively. Among infected all had features of depression. Among non-infected group, 26.31% participants had depression.

The median score (and interquartile range) of Hamilton depression rating scale in infected group and non-infected group was 12.60 (2.10) and 5.60 (2.87), respectively, and its significant value with mean rank is shown in Tables 3 and 4.

Discussion

The current pandemic of corona virus has affected the whole world in one way or the other. Governments in different countries have been trying to control its spread among people by creating awareness and taking several measures including lockdown. This crisis is disrupting education due to prolonged closure of schools and colleges, and loss of employment leading to financial disturbance; thereby creating a difficult situation for many people. This situation is exacerbated due to novelty of the virus, lack of any effective therapy and out of proportion media coverage. Hence, this pandemic is expected to negatively impact the mental health of population.

We did a case–control study to directly study the mental health aspect of suspected COVID-19 patients. Our study revealed that the suspected patients had significantly higher incidence of depression. Although it has been suggested that both infected and suspected COVID-19 patients may experience the fear of the consequences of the infection, there has been no previous such study to elucidate it.

Few previous studies during epidemics of other infectious diseases have also implicated their impact on mental health. A study done in 2014 on 117 ebola virus disease (EVD) survivors and their contacts to assess their psychological distress showed that around 38.5% of subjects suffered from lack of ability to concentrate, another 33.3% had loss of sleep.[7] Another study on 256 EVD survivors in Guinea, identified features of psychological suffering in about 15% of subjects, 11 of whom had features of severe depression.[8]

A study done in Taiwan on nursing staff who were caring for SARS patients, showed that mean score was in moderate depression range when the staff started to care for SARS patients, although it gradually improved 2 weeks after their duties with SARS patients ended.[9] Healthcare workers also form an important subgroup of people whose mental health status is directly affected by the pandemic or epidemic.

A questionnaire-based assessment of psychological status and quality of life was done in survivors of SARS in Singapore; 41% of subjects had symptoms of post-traumatic stress disorder and 30% had likely anxiety or depression.[10] Another study in Hong Kong done to assess subjective well-being of the elderly and young population in SARS epidemic concluded that elderly people showed significantly lower levels of subjective well-being.[11]

During the initial stage of the current pandemic, a study was done in China to assess the psychological impact on the general population, 53.8% of respondents rated the psychological impact of the outbreak as moderate or severe and 16.5% reported moderate to severe depressive symptoms.[12]

Our study was done in the suspected category of COVID-19 patients which fall at a higher risk of being psychologically affected; thereby we found a higher percentage of depressive symptoms.

The extensive media coverage, considerable mortality rate, and lockdown; all these factors have created a fear among population which is an expected response to the situation but its chronic and disproportionate persistence becomes a harbinger of bad mental health. It has also been suggested that suspected COVID-19 patients may experience fear of the consequences of infection including physical disability and death, which may form the basis for poor mental health. Our study clearly revealed this fact.

Several measures have been suggested to combat this problem of mental health. The need for mental healthcare in the present crisis was well addressed by Korea; they distributed leaflets among healthcare workers which mentioned the warning somatic signs for which they needed to contact mental health-care professionals. Furthermore, mental health services were provided at community and national level hospitals.[13] A directed approach toward vulnerable subgroups as mentioned above may be a more rewarding option in a resource poor country like ours.

This study had few limitations. We presently did not do a follow-up of the patients to see persistence of these symptoms in their later life. The study did not consider the economic background of the cases and control, which maybe a confounding factor for mental stress.

Conclusion

Several articles have expressed the concern on the mental health of whole population during the present pandemic. During these times, the number of people subjected to mental stress exceeds the number actually affected by the infection itself. There are several subgroups of the population which can be considered at higher risk of developing psychological problems. Healthcare workers, patients with preexisting mental illness, and patients with history of substance abuse are some of the vulnerable subgroups. We want to highlight by the medium of this study that suspected COVID-19 patients also form an important vulnerable subgroup which is negatively impacted by the pandemic.

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