

## Neurological and Mental Health Responses to Pandemic Covid-19

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### ABSTRACT

**Aim:** To assess the neurological and mental health responses to pandemic Covid-19.

**Study design:** Cohort study

**Place and duration of study:** Department of Medicine, Chandka Medical College Hospital Larkana and Department of Medicine, Khairpur Medical College Hospital Khairpur Mir's from 1<sup>st</sup> October 2021 to 31<sup>st</sup> March 2022.

**Methodology:** Two hundred patients who suffered Covid-19 infection and 200 who had any other life event except Covid-19 were enrolled. All patients who were above 18 years of age and were positive for Covid-19 through reverse transcriptase PCR were included in the study. Global Psych trauma Screening was done by enlisting twenty-two items which assessed trauma related symptoms while five items only assessed the factors increasing risks.

**Results:** There were 112 (56%) females and 88 (44%) males in Covid-19 patients and 150 (75%) females and 50 (25%) males in non-Covid patients. The mean age of the Covid-19 patients was 49.65±15.5 year while of non Covid patients was 39.02±12.01 years. A significant increase in post-traumatic stress disorder (PTSD) cases probability was noted in the Covid-19 cases than non Covid-19 related events. Neurological responses showed that patients who had suffered from Covid 19 infections had a generalized weakness with hyposmia formation.

**Conclusion:** Covid-19 is related with high level of depression, anxiety, hyposmia and other mental and neurological responses.

**Keywords:** Neurological health, Mental health, Response, Covid-19

### INTRODUCTION

Novel coronavirus had infected more than 200 million people globally since its initiation in 2019 from China. Around 4 million individuals died until last year due to the fatal infective responses of pandemic 19<sup>1,2</sup>. By the time it started the scientist all over the world have been focusing on finding associated factors and methods of treatment for reducing the fatality of this infection and related comorbidities<sup>3,4</sup>.

Various researches<sup>5-7</sup> have confirmed a strong association of mental as well as neurological ailments with Covid-19. This link is of high concern as is related with major comorbidities including stroke and heart attacks which are leading cause of morbidity all over the world<sup>5-7</sup>. The Covid-19 virus is from beta genus including SARS CoV 1 and ERS CoV which are respiratory syndrome causing since 2003 and 2012 respectively. They lead into disease of central as well as peripheral nervous system disturbing mental and neurological health<sup>8</sup>.

The most important neurological complaints in a pandemic like Covid-19 are anosmia, headache, ageusia, stroke, Seizure, impaired consciousness and encephalopathy. Stress and psychological anxiety and isolation cause severe mental disorders in Covid-19<sup>9-15</sup>.

The present study was designed to enlist all the neurological and mental disorders which are the result of Covid-19 infection and needs to be addressed for life saving and patient's health related betterment.

### MATERIALS AND METHODS

This cohort study was conducted after ethical committee permission in the Department of Medicine, Chandka Medical College Hospital Larkana and Department of Medicine, Khairpur Medical College Hospital Khairpur Mir's from 1<sup>st</sup> October 2021 to 31<sup>st</sup> March 2022. Two hundred patients who suffered Covid-19 infection and 200 non-Covid patients were also taken. All patients who were above 18 years of age and were positive for Covid-19 through reverse transcriptase PCR were included in the study. The

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responses towards neurological conditions as well as mental ailments were compared with responses of non-covid 19 patients which did not have any known ailment or disorder of neurological and psychological system. The sample size was generated by using sample size calculation formula with 95% CI and 5% margin of error while patients with known history of mental or neurological issues were excluded from the study. Depending upon the patient's conditions and criticality various tests for analyzing their mental and neurological tests were adapted within their active treatment time or post three to six months of time. These tests included CT scans, MRI radiographic imaging, electroencephalogram. All the clinical details, comorbidities history as well as psychological assessment through special generated questions was entered on a standardized proforma. Global Psych trauma screening was done by enlisting twenty-two items which assessed trauma related symptoms while five items only assessed the factors increasing risks. The score is calculated through aggregating all items score and identifying the final scoring between 0-17. Subdomain scoring was done through averaging items score of subdomains and ranging it within 0 to 1. The subdomains included depression (2 items), disturbances in self-organization (2 items), association (2 items), desistance abuse (1 item), anxiety (2 items), insomnia (1 item), self-harm (1 item), and other (1 item). Data was analyzed using SPSS version 26.0 through multi-variant analysis. P value <0.05 was taken as significant.

### RESULTS

There were 56% females and 44% males in Covid-19. The mean age of the covid-19 patients was 49.65±15.5 year while of non-Covid patients was 39.02±12.01 years. There was a significant difference between trauma onset, frequency, physical violence, recent abuse history as well as mental disturbances as a result of recent loss of family and or friend (Table 1).

In the present study, a significant increase in post-traumatic stress disorder (PTSD) cases probability was noted in the Covid 19 cases than non Covid 19 related events. Higher odds ration values with depression and dissociation of Corvid 19 patients was also interpreted through the results with insomnia more common in Covid 19 patients (Table 2).

Neurological responses showed that patients who had suffered from Covid 19 infections had a generalized weakness with hyposmia formation. They felt agitated for months and had

confused mental state. However, coma condition and stupor was only mentioned by a few cases (Fig. 1).

Table 1: Demographic history and psychological responses of Covid and non-covid participants

| Variable                            | COVID-19 (n=200) | Non-Covid 19 (n=200) | t or $\chi^2$ | p-value |
|-------------------------------------|------------------|----------------------|---------------|---------|
| Age (years)                         | 49.65±15.5       | 39.02±12.01          | 4.11          | <0.001  |
| Gender (female)                     | 112 (56%)        | 150(75%)             | 0.96          | 0.33    |
| Gender (males)                      | 88 (44%)         | 50(25%)              | 0.95          | 0.32    |
| Trauma onset (longer than 3 months) | 40(20%)          | 120 (60.0)           | 1109.21       | <0.001  |
| Trauma frequency (single)           | 140(70%)         | 128(64%)             | 41.56         | <0.001  |
| Work hardships                      | 68(34%)          | 60(30%)              | 14.59         | <0.001  |
| Physical violence                   | 46(23%)          | 54(27%)              | 9.61          | 0.002   |
| Recent Emotional abuse              | 68(34%)          | 88(44%)              | 50.65         | <0.001  |
| Recent Loss of family /friends      | 34(17%)          | 60(30%)              | 32.92         | <0.001  |
| Homicidal Thoughts/Attempt          | 6(3%)            | 5(2.5%)              | .12           | 0.75    |
| Suicidal Thoughts/Attempt           | 6(3%)            | 5(2.5%)              | .13           | 0.76    |
| Meeting DSM-5 criterion A           | 108(54%)         | 142(71%)             | 239.56        | <0.001  |

Table 2: Global Psychotrauma Screen symptoms comparison between Covid 19 and non Covid 19 participants

| Sub-domains     | COVID-19 | Non -Covid 19 | B    | Std error | t or Wald | P      | Partial $\eta^2$ or odds ratio |
|-----------------|----------|---------------|------|-----------|-----------|--------|--------------------------------|
| PTSD            | .52      | .47           | .06  | .02       | 5.01      | < .001 | 0.005                          |
| DSO             | .43      | .40           | .01  | .02       | 2.21      | .03    | 0.002                          |
| Anxiety         | .66      | .60           | .08  | .01       | 6.98      | < .001 | 0.006                          |
| Depression      | .63      | .56           | .08  | .02       | 5.73      | < .001 | 0.006                          |
| Dissociation    | .27      | .22           | .06  | .011      | 5.85      | < .001 | 0.007                          |
| Insomnia        | .57      | .55           | .09  | .07       | 1.98      | .15    | 1.1                            |
| Self-harm       | .09      | .08           | -.06 | .11       | .221      | .65    | 1.12                           |
| Substance abuse | .25      | .29           | -.08 | .07       | 1.56      | .26    | 0.005                          |
| Other problems  | .56      | .52           | .18  | .07       | 7.26      | .008   | 1.16                           |

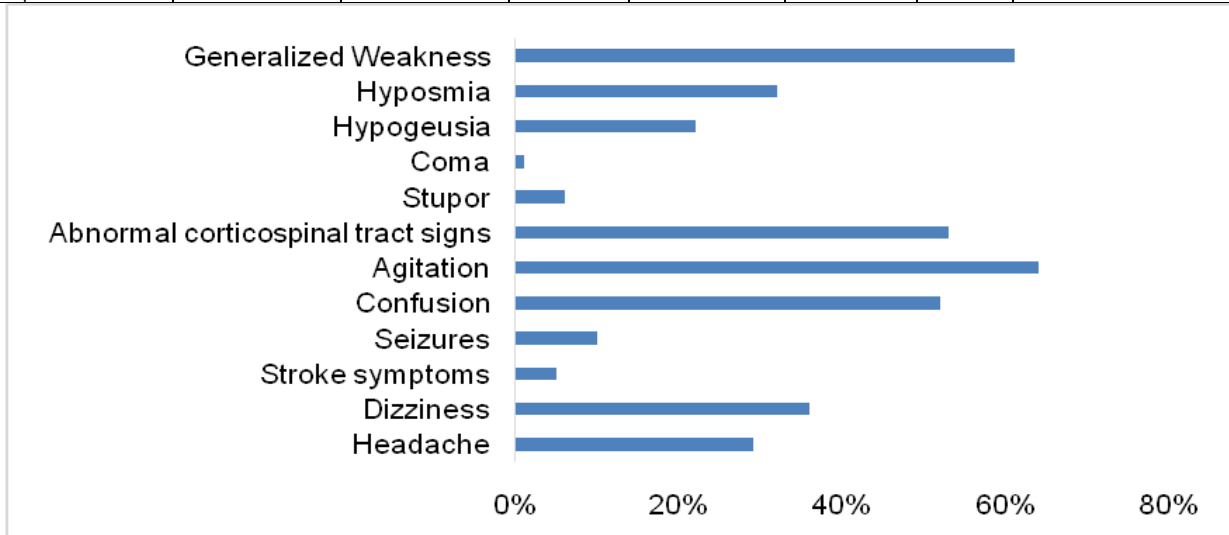


Fig. 1: Neurological responses of Covid 19 patients

**DISCUSSION**

The present study compared the neurological and mental disorders responsiveness of Covid 19 patients with non-Covid 19 infected cases. Mental and neurological ailments have been reported worldwide in patients who are under the burden of a pandemic as of pandemic 19 in the recent cases. The current study results interpreted that those patients who were suffering from serious ailment themselves or had a family member who had been either seriously ill or have been lost due to this pandemic were having higher grade of neurological and mental issues<sup>16-18</sup>.

Higher number of patients with symptoms of generalized anxiety and depression with PTSD cases has been reported in the present study results in Covid-19 patients than any other related non-Covid 19 patients or participants. This can be the direct effect of the pandemic where observing death and critical ailment of the community and loved ones create higher mental distress and neurological disorders. Similar has been reported in other studies

from various parts of the world. These studies have reported higher levels of depression, insomnia and PTSD in Covid 19 patients than the non Covid 19 subjects<sup>19-23</sup>.

The result of these researches also explains that the depression or anxiety is not only seen in general population suffering from this disease but also health care workers and any personal from any working area. Therefore Covid 19 related events were giving much enhances mental and neurological disorders than any other stressful events reported. Risk factors which can enhance these ailments included physical abuse, psychiatric history, suicidal or homicidal health conditions<sup>24,25</sup>.

**CONCLUSION**

Covid-19 is related with high level of depression, anxiety, hyposmia and other mental and neurological responses.

**Conflict of interest:** Nil

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