ORIGINAL RESEARCH

Assessment of neuropathic pain features in COVID 19 patients

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ABSTRACT

Background: Neuropathic pain is the most widely accepted term for non-nociceptive pain. The most obvious difference from nociceptive pain is the absence of a continuous nociceptive stimulus. The present study was conducted to assess of neuropathic pain features in COVID 19 patients. **Materials & Methods:** 48 COVID 19 patients with neuropathic pain of both genders were divided into positive (+) and negative (-) according to the PCR test results. Average values of pain intensity and Neuropathic Pain Questionnaire items were recorded. **Results:** Out of 48 patients, males were 28 and females were 20. In PCR +ve and PCR -ve subjects, the mean pain intensity (0-10) was 6.7 and 5.2, burning pain was 4.6 and 2.3, neuropathic pain questionnaire score was 0.16 and 0.02, throbbing pain was 4.5 and 3.1, electric pain was 3.7 and 1.2, numbness was 4.2 and 1.5, squeezing pain was 2.3 and 2.8, freezing pain was 3.9 and 0.92. How unpleasant was your usual pain score was 5.9 and 5.4, How annoying was your usual pain was 5.0 and 4.1, increased pain due to weather changes was 3.7 and 1.5, increased pain due to touch was 3.9 and 1.9 respectively. The difference was significant (P< 0.05). **Conclusion:** The frequency of neuropathic pain was significantly higher in PCR confirmed COVID-19 patients at the onset of the disease.

Key words: coronavirus disease, Neuropathic Pain, PCR

INTRODUCTION

It is surprising that the 2020 year started with the report of a dreaded novel viral coronavirus (SARS-CoV-2) disease threat in China and spreading all over the globe.[1] World Health Organization (WHO) has declared coronavirus disease-2019 (COVID-19) a Public Health Emergency of International Concern. Various changes in environmental factors and human behaviors have led towards the emergence of more than 30 new infectious diseases in the last 3 decades, ranging from rotavirus to Middle East respiratory syndrome coronavirus.[2] The increasing human population, people movement across diverse borders, rapid expansion of air traffic, changes in the climate have modified the ecosystem has made these novel pathogens can easily spread across the world.[3]

Neuropathic pain is the most widely accepted term for non-nociceptive pain. The most obvious difference from nociceptive pain is the absence of a continuous nociceptive stimulus.[4] Neuropathic pain is a condition that can have extremely disturbing effects on the patient and may become chronic if it is not treated timely and correctly.[5] Most patients with neuropathic pain complain of throbbing, piercing, or burning pain.[6] Apart from the pain, patients may complain of hyperalgesia (feeling more pain than should be felt with a stimulus that normally causes pain) or allodynia (pain caused by a painless stimulus, for example, feeling pain with cotton touch).[7] The present study was conducted to assess of neuropathic pain features in COVID-19 patients.

MATERIALS & METHODS

The present study consisted of 48 COVID 19 patients with neuropathic pain of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The patients were divided into positive (+) and negative (-) according to the PCR test results. Average values of pain intensity and Neuropathic Pain Questionnaire items were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 48		
Gender	**Male**	**Female**
Number	28	20

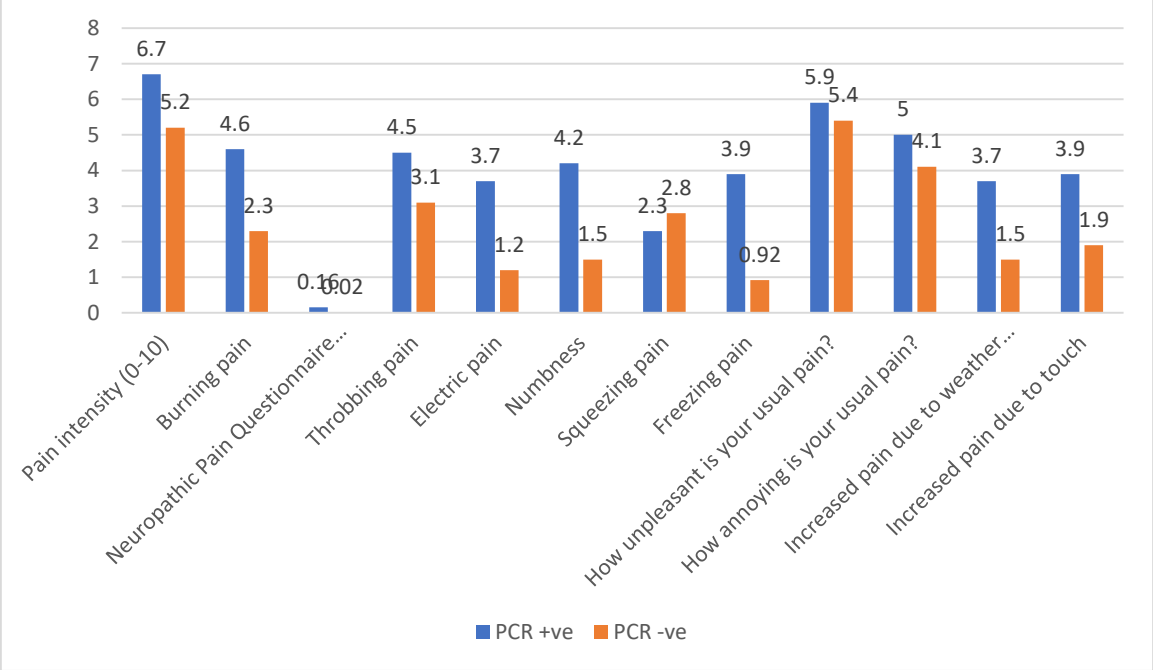
Table I shows that out of 48 patients, males were 28 and females were 20.

Table II Average values of pain intensity and neuropathic pain questionnaire items based on PCR results

Parameters	PCR +ve	PCR -ve	P value
Pain intensity (0-10)	6.7	5.2	0.04
Burning pain	4.6	2.3	0.05
Neuropathic Pain Questionnaire score	0.16	0.02	0.001
Throbbing pain	4.5	3.1	0.02
Electric pain	3.7	1.2	0.04
Numbness	4.2	1.5	0.02
Squeezing pain	2.3	2.8	0.19
Freezing pain	3.9	0.92	0.001
How unpleasant is your usual pain?	5.9	5.4	0.95
How annoying is your usual pain?	5.0	4.1	0.04
Increased pain due to weather changes	3.7	1.5	0.01
Increased pain due to touch	3.9	1.9	0.03

Table II, graph I shows that in PCR +ve and PCR -ve subjects, the mean pain intensity (0-10) was 6.7 and 5.2, burning pain was 4.6 and 2.3, neuropathic pain questionnaire score was 0.16 and 0.02, throbbing pain was 4.5 and 3.1, electric pain was 3.7 and 1.2, numbness was 4.2 and 1.5, squeezing pain was 2.3 and 2.8, freezing pain was 3.9 and 0.92. How unpleasant was your usual pain score was 5.9 and 5.4, How annoying was your usual pain was 5.0 and 4.1, increased pain due to weather changes was 3.7 and 1.5, increased pain due to touch was 3.9 and 1.9 respectively. The difference was significant (P< 0.05).

Graph I Average values of pain intensity and neuropathic pain questionnaire items based on PCR results



DISCUSSION

SARS-CoV entry into the human host cell is mediated primarily by cellular receptors angiotensin enzyme-2 (ACE2) that is expressed in the lung parenchyma, kidney cells, vascular endothelia, small intestine cells, and human airway epithelia. MERS-CoV enters humans host cells primarily by dipeptidyl peptidase-4 (DPP4) in the cells of the immune system, liver, small intestine, and lower respiratory tract.[8] Indeed, ACE2 or DPP4 alone is not enough to make the host cell susceptible to infections. SARS-CoV or MERS-CoV infections were also reported in the CNS, where ACE2 or DDP4 expression level is low under normal conditions.[9] The accurate route where SARS-CoV and

MERS-COV enter CNS is still not clearly documented.[10] Indeed, the lymphatic or hematogenous path seems to be impossible, particularly in the initial infection stage and there were no virus particles were detected in the infected brain area. However, several shreds of evidence indicate that CoVs may initially invade peripheral nerve terminal, and later to the CNS through a synapse-connected route. The trans-synaptic transfer has been reported for HEV67 CoV and avian bronchitis virus.[11] The present study was conducted to assess of neuropathic pain features in COVID 19 patients.

We found that out of 48 patients, males were 28 and females were 20. Ocak et al[12] evaluated neuroptic pain as presenting symptom in COVID-19 patients. In total, 440 participants included in the study. Among 301 who stated to had any complaints, 197 (65.4%) had pain. The intensity of their pain was 5.8 ± 2.4 (0 – no pain and 10 – the most severe pain of life). Neuropathic pain component was present in 29.2% of the patients. Among the first admissions, neuropathic pain component was observed significantly higher in those with positive PCR test (55.0%) than negative ones (23.8%), and the Odd's ratio was calculated as 3.911.

We found that in PCR +ve and PCR -ve subjects, the mean pain intensity (0-10) was 6.7 and 5.2, burning pain was 4.6 and 2.3, neuropathic pain questionnaire score was 0.16 and 0.02, throbbing pain was 4.5 and 3.1, electric pain was 3.7 and 1.2, numbness was 4.2 and 1.5, squeezing pain was 2.3 and 2.8, freezing pain was 3.9 and 0.92. How unpleasant was your usual pain score was 5.9 and 5.4, How annoying was your usual pain was 5.0 and 4.1, increased pain due to weather changes was 3.7 and 1.5, increased pain due to touch was 3.9 and 1.9 respectively. Mao et al[13] reported dysgeusia (5.6%), dysosmia (5.1%), visual disturbances (1.4%), and neuralgia (2.3%) as peripheral nervous system effects.

Baig et al[14] have recently published an article where they suggested a putative transcrabrial SARS-CoV-2 route to the brain and emphasized that SARS-CoV-2 RNA isolation in the cerebrospinal fluid would be the conclusive evidence to report the COVID-19 neurovirulence.

The limitation the study is small sample size.

CONCLUSION

Authors found that the frequency of neuropathic pain was significantly higher in PCR confirmed COVID-19 patients at the onset of the disease.

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