

Trigeminal Neuralgia in a Couple: Case Report

Ashraf Ali J B

Senior Assistant Professor, Department of Physiology, Govt. Thiruvarur Medical College,

Abstract

Objective: To discuss a case report of Trigeminal Neuralgia (TN) in a couple.

Background: The world is witnessing Covid 19 since March 2020 as a Pandemic as per World Health Organisation. Covid 19 was primarily presented with Respiratory symptoms. Though, it also affects the other systems, especially the Nervous System which is getting reported with many Neurological signs. Presenting TN in a couple is a rare and unusual entity.

Methods: We discuss the clinical manifestations of Trigeminal Neuralgia in a couple at some stage in Covid 19 Era. We also review the possible Pathophysiology and Differential Diagnosis of the disease as per the Literature.

Results: Patient Y was a 41 years old male who presented with increased tooth sensitivity to temperature, progressively stabbing pain increased in the right V3 of Trigeminal Zone with no other Neurological Manifestations.

Patient X was a 33 years old female who had Tinnitus progressed with a toothache and stabbing pain in the right V3 of the Trigeminal Zone with no other Neurological Manifestations.

Both had no History of Covid 19 clinical symptoms in the recent past. Both were diagnosed with TN probable post-viral infection and treated with steroids following which the symptoms improved.

Conclusions: Trigeminal Neuralgia is likely due to SARS-CoV-2. Still, we must undergo more studies to find the pathophysiology of this Covid 19 infection.

Keywords: *Trigeminal Neuralgia, Covid 19, Demyelination, Post viral Infection, Neurological Manifestations, steroids.*

Introduction

In Wuhan, China, a case of Atypical Pneumonia was reported due to unknown Etiology in December 2019. In January 2020, World Health Organisation announced it as 2019 – Novel Coronavirus (2019 – nCoV)⁽¹⁾. In March 2020, WHO declared 2019 – nCoV as a Pandemic⁽²⁾.

Respiratory Symptoms are dominant in 2019 – Novel CoronaVirus. Other Symptoms like

Headache, Dizziness, Abdominal pain, Diarrhoea, Anosmia, and Dysgeusia were also reported in the clinical course of the disease^(3,4).

In SARS -2002 and MERS 2012, coronavirus was found to be a Neurotropic Virus^(3,4). Either by a hematogenous or retrograde axonal pathway through certain Cranial nerves, Coronavirus can extend towards the CNS. Coronavirus penetrates our cells through Angiotensin-Converting Enzyme

Receptor 2 (ACE2). It was stated that Endothelium, Glial cells, and Neurons express Angiotensin Converting Enzyme Receptor, as it is the probable target for Coronavirus ⁽⁵⁾.

In March 2020, an Italian Neurologist's warned the world to look for poorly defined Neurological conditions in Covid 19 patients ⁽⁶⁾.

Though Headache was found in the 2019 nCoV, studies on the characterisation of the pain were also done and it depends on Duration, Lateralization, Location, Pain quality, and Headache Intensity ⁽⁷⁾. Trigeminal Neuralgia was presented as a sole clinical manifestation of Covid 19 ⁽⁸⁾. After a Covid 19 Vaccination, it was reported that a Patient developed a case of TN ⁽⁹⁾.

Case Report

Patient Y was a 41 years old male with increased tooth sensitivity to temperature, progressively stabbing pain increased in the right V3 of Trigeminal Zone for one week with no other Neurological Manifestations in August 2021. Blood investigations were normal. He has had a history of Diabetes Mellitus for 3 years on regular treatment under control. MRI Brain showed Multiple Tiny Oval Shaped Hyperintensities in Right TemporoParietal and Left FrontoParietal Sub Cortical Lobe. Probable Small Foci of Demyelination. He had no History of Covid 19 clinical symptoms in the recent past. The patient was diagnosed with TN post-viral infection and treated with steroids by which the symptoms improved. He was vaccinated with doses of Covishield in January and February 2021.

Patient X was a 33 years old female who had Tinnitus progressed with a toothache and stabbing

pain in the right V3 of the Trigeminal Zone for 3 days with no other Neurological Manifestations in November 2021. Blood Investigations and MRI brain were reported as normal. She had no History of Covid 19 clinical symptoms in the recent past. The patient was diagnosed with TN probable post-viral infection and treated with steroids following which the symptoms were relieved. She was vaccinated with two doses of Covishield in Feb and March 2021.

The onset of Clinical Symptoms between Patient X and Y was around three months. Both the patients were treated with steroids and the symptoms improved clinically. Covid Antibody IgG was positive for Patient X & Y and Covid Antibody IgM was negative for Patient X & Y.

Discussion

Couples with particular illnesses are at increased risk of diseasing themselves, at least 70% increased risk for asthma, depression, and peptic ulcer disease. This is an indication that shared environmental risk factors are on top of any genetic or distant exposure or shared activities about seeking health care ⁽¹⁰⁾.

This clinical case among the couple explains the possible care issues surrounding the cases of conjugal neurological disease and the possibility of finding joint environmental risk aspects.

The possible mechanism behind Headache associated with Covid 19 could be the invasion of the virus to the Trigeminal Nerve endings in the Nasal Cavity ⁽¹¹⁾.

ACE produces Angiotensin II which acts on Angiotensin II Receptor Type 1 (AT1R) all over the body, which is involved in the pathogenesis

of Cardiovascular disease, Vasoconstriction, and Oxidative Stress⁽¹²⁾. On the other side, Angiotensin II is hydrolysed into Ang 1-7 by ACE 2. Ang 1-7 inhibits ACE/Ang II/AT1R axis by counteracting its effect which includes Cardiovascular protection, Vasodilation, Anti-Oxidative Stress, and Antinociception. Thus ACE2 inhibits the action of Ang II and also causes the opposite effects⁽¹³⁾.

2019 nCoV enters our body through ACE2, which was identified as a host receptor. This causes the unbalance in the actions of ACE and ACE2, as 2019 nCoV causes the internalization of ACE2 by downregulating its function⁽¹⁴⁾.

The angiotensin system is also present in the Trigeminal Ganglia of Human and Rat⁽¹⁵⁾.

ACE2 is also found in the endothelial cells, by producing inflammation. Indirect Trigeminal activation caused by ACE2 and proinflammatory cytokines during the Covid 19 can lead to pain⁽¹⁶⁾.

Conclusion

Trigeminal Neuralgia must not be underestimated as just another type of Headache. Post pandemic of Covid 19, all the Nonrespiratory symptoms have to be evaluated along with its Pathophysiology.

Conflict of Interest Statement : None

Source of Funding : Nil

References

1. D.S. Hui et al. / *International Journal of Infectious Diseases* 91 (2020) 264–266
2. WHO Director-General's opening remarks at the media briefing on COVID19 -March 2020 <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
3. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*. 2020;395:507-513.
4. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497-506
5. Li YC, Bai WZ, Hashikawa T. The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. *J Med Virol Epub* 2020 Feb 27
6. Armocida D, Palmieri M, Frati A, Santoro A, Pesce A (2020) How SARS-Cov-2 can involve the central nervous system. A systematic analysis of literature of the department of human neurosciences of Sapienza University, Italy. *J Clin Neurosci* 79:231–236
7. Dos Anjos de Paula RC, de Maria Frota Vasconcelos T, da Costa FBS, et al. Characterization of Headache in COVID-19: a Retrospective Multicenter Study. *Mol Neurobiol*. 2021;58(9):4487-4494. doi:10.1007/s12035-021-02430-w
8. Molina-Gil J, González-Fernández L, García-Cabo C. Trigeminal neuralgia as the sole neurological manifestation of COVID-19: A case report. *Headache*. 2021;61(3):560-562. doi:10.1111/head.14075
9. Kaya A, Kaya SY. A case of trigeminal neuralgia developing after a COVID-19 vaccination [published online ahead of print, 2021 Dec 6]. *J Neurovirol*. 2021;1-2.

doi:10.1007/s13365-021-01030-7

10. Hippisley Cox J, Coupland C, Pringle M, Crown N, Hammersley V. Married couples' risk of same disease: cross sectional study *BMJ* 2002; 325 : 636 doi:10.1136/bmj.325.7365.636
11. Doobay MF, Talman LS, Obr TD, Tian X, Davisson RL, Lazartigues E. Differential expression of neuronal ACE2 in transgenic mice with overexpression of the brain renin-angiotensin system. *Am J Physiol Regul Integr Comp Physiol*. 2007;292:R373-R381
12. Zhang H, Penninger JM, Li Y, Zhong N, Slutsky AS. Angiotensin-converting enzyme 2 (ACE2) as a SARS-CoV-2 receptor: Molecular mechanisms and potential therapeutic target. *Intensive Care Med*. 2020;46:586-590.
13. Xu P, Sriramula S, Lazartigues E. ACE2/ANG- (1-7)/Mas pathway in the brain: The axis of good. *Am J Physiol Regul Integr Comp Physiol*. 2011;300:R804-R817.
14. Zhou P, Yang X, Wang X, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579:270-273
15. Imboden H, Patil J, Nussberger J, et al. Endogenous angiotensinergic system in neurons of rat and human trigeminal ganglia. *Regul Pept*. 2009;154:23-31
16. Varga Z, Flammer AJ, Steiger P, et al. Endothelial cell infection and endothelitis in COVID-19. *Lancet*. 2020;395:1417-1418.