

Clinical and Microbiological Assessment to Correlate RT-PCR Ct Value with Post Covid Symptoms in Health Care Workers: Does Adjuvant Therapy Helps Alleviate Post Covid Symptoms?

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ABSTRACT

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a newly discovered strain of coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Most people who fall sick experience mild to moderate illnesses with the most common symptoms being fever, dry cough, fatigue and breathlessness. Patients are detected by gold standard test i.e. RT-PCR along with radiological and clinical investigations and thereby treated accordingly. The anti-inflammatory property of adjuvants taken during SARS-COV-2 infection has shown tremendous results in the treatment of COVID-19. Many studies have not been done regarding these adjuvants and recovery of patients. Therefore, we tried to observe correlation between RT PCR Ct value with post covid symptoms and the adjuvant therapies which the patients took during their illness to determine whether this information provided useful clinical information.

Keywords: Post Covid Symptoms, Adjuvant Therapy, (Real Time RT-PCR), SARS-COV.


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INTRODUCTION

COVID-19 is a respiratory disease caused by SARS-CoV-2, a new coronavirus discovered in 2019. The virus is thought to spread mainly from person to person through respiratory droplets produced when an infected person coughs, sneezes, or talks. Some people who are infected may not have symptoms. For people who have symptoms, illness can range from mild to severe. Real Time Reverse Transcription Polymerase Chain Reaction (Real Time RT-PCR) is the gold standard test for detection of SARS-CoV-2. This test enables early detection of viral genome in clinical samples. A positive test enables the clinicians and public health professionals to quickly isolate the patient and prevent spread of the disease. The number of cycles required for the fluorescent signal to cross the threshold (i.e. exceeds background level) is called Ct (cycle threshold). Ct values are inversely proportional to the amount of target nucleic acid in the sample (i.e. the lower the Ct level the greater the amount of target nucleic acid in the sample).¹

As soon as the patient is diagnosed positive, he is put on allopathic treatment and also advised to take some adjuvants like vitamin C, steam inhalation, herbal decoction and turmeric milk

which would help in his speedy recovery. We here discuss the correlation between RT PCR Ct value with post covid symptoms and whether these adjuvant therapies which the patients took during their illness proved beneficial for them.

MATERIALS AND METHODS

A retrospective study was done on 200 patients over a period of 2 months. i.e. 17th July till 17th September. Throat or deep nasal cavity swabs were collected dipped in viral transport media (VTM) taking all universal precautions.

Samples were properly labelled, packed in triple packaging layer and were transported to laboratory maintaining an adequate cold chain.

All the samples were processed in bio safety laboratory-3 by taking biosafety precautions. Their RNA was extracted by using Perkins Extraction kit and their SARS-CoV-2 was diagnosed by real time reverse transcriptase polymerase chain reaction assay (RT PCR assay) by using commercial kit Quantiplus which targeted 2 genes i.e. E gene (envelope protein) and N gene (nucleocapsid protein).(Table:1)

Table:1 Interpretation of results by Quantiplus kit

E gene (FAM)	N gene (Yakima Yellow)	Internal Control (Cy5)	Interpretation	Conclusion
✓	✓	✓	2019-nCoV RNA Detected	Proceed for further Analysis
-	✓	✓		
-	-	✓	2019-nCoV RNA Not Detected	
✓	-	✓	B-beta CoV specific RNA detected*	
-	-	-	Possible inhibition of PCR	Dilute the RNA sample (1:10) and repeat the Assay

RESULTS

Out of 200 patients, there were 71% male and 29% females. We divided these patients into 3 age groups as <40 years, 40-60 years and >60 years. We found that maximum patients (83%) belonged to age group of <40 years. We classified Ct values in 3 ranges i.e 11-20, 21-30 and >31 and observed that maximum (60%) patients had moderate ct value in between 21-30. There were 116 (58%) patients out of 200, in whom post covid symptoms were observed and 84 (42%) patients didn't show any PCS. Of 116, there were 70% (81) patients who were also taking some adjuvant therapies along with allopathy treatment and 30% (35) patients who were not taking any kind of adjuncts. We divided these 70% (81) patients into 4 categories according to their recovery days. i.e. 5-10 days; 10-15 days; 15-20 days and >20 days and found that the majority of patients (63%) who were on adjuncts along with allopathy treatment recovered in 10-15 days. Also, we divided those patients who were not on any adjuncts into similar categories i.e. 5-10 days, 10-15 days, 15-20 days and >20 days. It was observed that the majority (57%)

patients took more time (>20 days) in recovery as compared to ones who took adjuncts. (Fig:1) The patients relying on adjunct treatments had a mean(σ) recovery period of 12.3 days whereas the patients not taking any adjunct therapy had a mean(σ) recovery period of 18.6 days. All these patients showed various PCS (POST COVID SYMPTOMS) like generalised body weakness, myalgia, fever, exertional dyspnoea, cough, fatigue, confusion, anosmia and ageusia. The research highlights that adjuncts proved helpful in eliminating inflammation, clearing viruses and thereby speeding recovery in those who took them as compared to those who didn't. Especially for the patients whose ct value was >31, taking these adjuvants at an early stage might be one of the reasons that they didn't suffer from any serious post-covid symptom. Among these 200 cases, there were 8% patients who were asymptomatic and therefore they didn't take any adjuncts during their whole phase of isolation period. Also they didn't show any PCS after their isolation period got over.

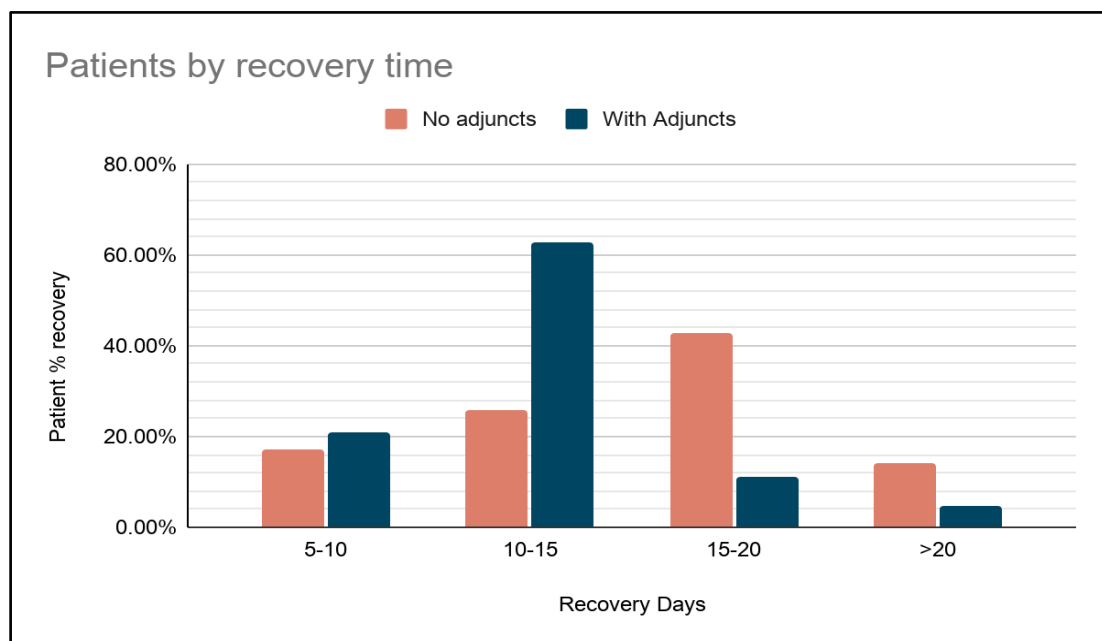


Fig 1: Patients showing recovery with and without adjuvant therapy.

DISCUSSION AND CONCLUSION

In our study we tried to observe whether adjuvant therapy like vitamin C, steam inhalation or consumption of turmeric milk or herbal decoction helps in speedy recovery or not and therefore we found that nearly all the patients in our study took vitamin C, steam inhalation and few of them also took turmeric milk and herbal decoction. And in those patients (70%) who took these therapies at an early stage and ct value was between 21-30 or >/31, the post covid symptoms weren't prominent. One of the reasons behind this as discussed by Mandal Ananya² is that Steam inhalation cycles are considered to be useful in damaging the capsid of the SARS-CoV-2 envelope and prevent infection. Giancarlo la Marca et al³ and Cohen Marc⁴ also stated that steam inhalation at temperature 55–65 °C might indeed be beneficial in halting SARS-CoV-2 virus infection in the upper airway mucosae during the initial stages of infection and possibly preventing further spread. Potential benefits of Vitamin C (VC) otherwise known as ascorbic acid have sparked an interest regarding finding its use in the treatment of COVID-19. Kumari P et al⁵ in their study concluded that Vitamin C is known to boost immunity and acts as a potent antioxidant. Therefore, VC supplementation can be beneficial in resolving infection and inflammation by reducing CRP and LDH levels in body.⁶ Also it slightly improves physical activity and cold incidence in covid patients.⁷

Similarly, turmeric milk which contains Curcumin as an active agent has multiple health benefits due to its antioxidant and anti-inflammatory mechanism. It helps in curing hyperlipidemia and relieves muscle soreness.⁸

A very peculiar feature we saw in one of our covid patient who was suffering from cancer and her RT PCR value was >/31. In spite of being immunocompromised she was pauci symptomatic and didn't face any post covid symptom either. The reason could be that people receiving chemotherapy are more often prescribed growth factor medications to increase their white blood cell count and make them less vulnerable to developing serious complications if they are infected with COVID-19. This could possibly be attributed to much stricter application of social distancing procedures also that the patient was aware of that she might be at higher risk of severe COVID-19 infection. Prophylactic changes implemented in breast cancer care (e.g., postponement of all non-mandatory visits to ICH, and preferring telemedicine) may also have contributed to further reduce the risk of SARS-CoV-2 infection.⁹ Also estrogen if given for breast cancer may cause vasodilation and antioxidant effect of angiotensin 1–7 and causes ER- α upregulation in T lymphocytes. Thus, increases the release of interferon I and III from T lymphocytes. Increasing interferon I and III alleviates COVID-19 infection¹⁰

To conclude, patients when advised to take adjuvant therapies along with standard treatment show good prognosis. These therapies help to alleviate POST COVID SYMPTOMS by reducing inflammation in body, helps increase white blood cell count and boost the immunity to fight infection. Hence patient recovers fast and gets exempted from PCS in future. This can prove beneficial not only to a layman but also to our health care workers who can safely resume their duty back and come back to normal life.

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