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Case Report

Tears and Conjunctival Swab Positive, Nasopharyngeal Swab Negative for SARS CoV-2

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ABSTRACT:
The pandemic year 2020 opened new ways of handling our day-to-day activities. Coronavirus affected people of all ages all over the world. Paramedics and medics were working hand in hand day in and out at Dr. D.Y.Patil medical college, Hospital and Research Centre. Nasopharyngeal swabs were taken for rt PCR to confirm the Cycle time of the virus and its potency.

Keywords: Coronavirus, RT-PCR, Nasopharyngeal swabs, Tears, Conjunctival swab

INTRODUCTION:

During one of our ongoing research on the presence of coronavirus in tears, this was an unusual case we came across.[1] It is almost a year that we are trying to discover and rediscover COVID-19. Since the pandemic, the virus seems to be mutating its presentation feature *in vivo*. We at our COVID-19 ward carried out a research project based on the hypothesis drawn from earlier studies. A review of the literature confirms the presence of SARS CoV-2 in tears and conjunctival Sac [Wu *et.al.* 2020],[2] whereas some studies contradict it [Seah *et.al.* 2020].[3] Some studies have shown the association of ocular symptoms with the presence of SARS CoV-2 in tears [Wu et.al 2020, Xia *et.al.* 2020].[4] The presence and frequency of SARS CoV-2 in the tears were found less during earlier studies. So far, all the studies have emphasized the presence of SARS-CoV-2 in the nasopharyngeal swab. We observed moderate to severe dry eye [Schirmer strip readings range 2-8mm] in patients confirmed clinically or laboratory with COVID-19. We performed tears collection with Schirmer's paper, conjunctival and nasopharyngeal swabs from COVID-19 patients. To test the presence of virus in tears and conjunctival swabs, we followed the molecular technique of RT-PCR, a gold standard method to test this new coronavirus SARS-CoV-2. Initially, we collected tears and a conjunctival swab from a suspected patient put it into a viral transport medium and extracted RNA through TRUPCR viral RNA extraction kit and performed qRT-PCR by TRUPCR SARS-CoV-2 RT qPCR Kit (3B BlackBio Biotech, India) on QuantStudio 12K Flex thermocycler. Each sample was collected along with a laboratory referral form referred by ICMR and studied the clinical manifestation of patients.

CASE HISTORY:

On the day of admission 2-10-2020 on 4th floor as COVID -19 suspect [clinically diagnosed].
The presence of SARS COV-2 in tears and conjunctiva for 7 days, with negative results of the nasopharyngeal swab is of concern. The early cycle time indicates a significant viral load two days after the compliance of symptoms.
The patient had come with the compliance of breathlessness since 2 days.
Tear sample and conjunctival swab were taken as per my research project methodology.

Repeat collection of the sample after 24 hours i.e. three consecutive days the samples were collected. The nasopharyngeal swab was taken on 5th day of the patient's admission. In the meantime, the patient was shifted from the suspect ward to COVID ICU ward. The result of nasopharyngeal came on the 6th day of her admission and the patient was shifted to medical ICU as the result was negative for COVID-19 .

Surprisingly, the tear sample and the conjunctival swab was positive by RT PCR for the same patient.

Table 1. Summary of the sample taken and the RT-PCR* Result.

Date of admission	Compliance since	Day	Tear sample	Conjunctival swab	Nasopharyngeal swab
2-10-2020	2 days	1st day	+ve	+ve	Not taken
		3rd day [48 hours later]	+ve	+ve	Not taken
		4th day	Not taken	Not taken	Negative
		7th day	**+ve**	**+ve**	**Negative**
		13th day	**-ve**	**-ve**	-

Table 2.Details of rtPCR, Ct values of the sample taken.

Date of admission	Illness	Post illness day Sample Collection	Conjunctival swab	Ct** values	Tears Sample	Ct values	Nasopharyngeal swab	Ct values
02-10-2020	Breathlessness since 2 days	1st day	Positive	E gene: 19.080 RNaseP: 30.004 RdRp: 18.892	Positive	E gene: 20.610 RNaseP: 28.595 RdRp: 19.912	Not received	Nil
		3rd day [48 hours later]	Positive	E gene: 20.077 RNaseP: 23.545 RdRp: 20.193	Positive	E gene: 21.370 RNaseP: 26.365 RdRp: 21.951	Not received	Nil
		4th day	Not received	Nil	Not received	Nil	Negative [inconclusive]	E gene: 31.598 RNaseP: 22.433 RdRp: 34.292
		7th day	Positive	E gene: 31.599 RNaseP: 23.755 RdRp: 34.786	Positive	E gene: 31.823 RNaseP: 25.481 RdRp: 33.374	Nil	Nil
		13th day	Negative	E gene: UND*** RNaseP: 26.4 RdRp: UND	Negative	E gene: 34.915 RNaseP: 28.912 RdRp: 36.126	Nil	Nil

***Reverse transcriptase polymerase chain reaction, **Cycle Time, *** UND- Undetermined**

DISCUSSION:

The patient visited with the complaints after 2 days of breathlessness. She was positive with low Ct values as presented in the table 2. The patient was positive for the test since 7 days. It means that the virus was active in her tears. The transmissibility of the virus to fellow person cannot be ruled out. We are not sure for the infestation time of the virus in tears, was it before the breathlessness started or after that. The documented values for sure indicates that virus remains active in the tears for 7 days.

CONCLUSION:

It can be concluded that even tears shows presence of virus with early CT which is the most infective stage. Nasopharyngeal swab is considered to be the standard for the rt PCR for coronavirus. There may be chances that swab from the nasopharynx did not contain sufficient viruses to be detected in rtPCR. More patients should be tested for the presence of corona virus in tears to actually correlate the results more effectively.

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