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Letter to the Editor

Oscillation of SARS CoV-2 RNA load in a cohort of children and adolescents with neuro-psychiatric disorders resident in a nursing home of Lombardy Region (Italy)



COVID-19 has heavily affected nursing homes for elderly people in Italy and particularly in the Lombardy region, causing uncountable deaths. From the moment the pandemic slowly faded, there has been a pressing scientific and social need to define a limit of time and of viral load beyond which the positivity of RT-PCR loses its meaning, to reduce the isolation of the subjects in the nursing homes beyond the clinical and public health utility.

While the decline in viral infectivity seems to decline in one or two weeks since symptom onset¹⁻² the RT-PCR positivity may persist for several weeks after the resolution of symptoms³⁻⁶. Since there is a minimal risk for persistently-positive recovered patients to shed infectious virus, many of them remain hospitalized, or in shelter-in-place, for a much longer time than necessary, with significant social distress and economic commitment.

Few data are available so far in children and adolescent nursing homes regarding quantitative RT-PCR (qRT-PCR) registered during the COVID-19 pandemic.

Fifty-two children and adolescents (41 males 11 females; mean age 14.8, range 6–18 years) affected by neuropsychiatric disorders and resident in Villa Santa Maria Rehabilitation Institute, a well-known nursing home in Lombardy region, underwent a series of qRT-PCR on nose-pharyngeal swabs from April 27 to July 4th, 2020.

Thirty-two subjects had symptoms suggestive of COVID-19 infection, like fever, cough, and or diarrhea while 20 were asymptomatic. Sixty-two percent of symptomatic subjects and 50% of asymptomatic subjects resulted positive to COVID-19 with a total of 30 positive cases (25 males - 5 females; mean age 14.1 years).

Subjects showing positivity to the test were monitored throughout with repeated tests on a 1–2-week basis until the obtainment of two consecutive negative tests. We had to wait till July 4th to certify the negative turning of all subjects.

Interesting details of viral load in the 30 subjects positive at RT-PCR were observed according to different subgroup characteristics. The initial viral load of 25 males was significantly higher than 5 females (median [IQR] males: 19 [14 – 23.5] vs. 27 [24–29], respectively; $p=0.01$ by Mann-Whitney test).

Initial viral load observed in 21 symptomatic subjects resulted substantially higher in comparison with 9 asymptomatic subjects (median [IQR] with symptoms: 20 [15 –27] vs. 22 [16.5–25], respectively; the difference anyway resulted statistically not significant ($p=0.8$ Mann-Whitney test). The viral load at the first swab in 16 subjects who remained still positive at second swab was higher in comparison with 14 subjects who resulted negative at second swab. Also in this case the difference resulted statistically not significant (median CT[IQR] still positive: 19.5 [14.5 –23.7] vs. 22 [17.7–27], respectively ($p=0.4$ Mann-Whitney test).

Twenty subjects underwent more than two RT-PCR tests until permanent negative turning.

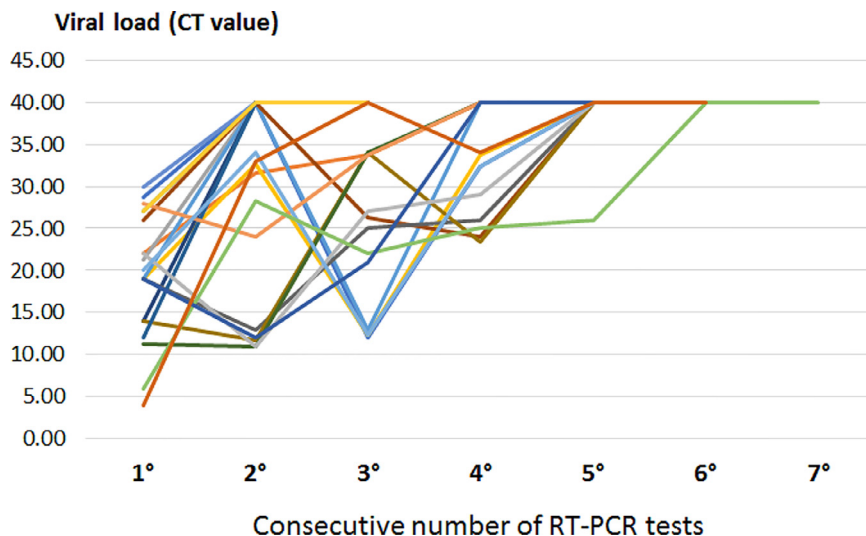


Fig. 1. Cycle-thresholds (CT) values oscillation in 20 subjects undergoing repeated COVID-19 RT-PCR tests (values above 40 are considered negative).

Fig. 1 shows the oscillation of viral load in the subsequent 97 swabs, performed along 12 weeks after the first swab. A marked oscillation of viral load value was observed, also with negative swabs turning positive.

This study shows that in children and adolescents found positive at COVID-19 RT-PCR being resident in a nursing home the time required for a definitive disappearance of the virus from nose-pharyngeal swab can overcome two months. Along this period is possible to observe the existence of discrete oscillation in COVID-19 viral load count in line with the results of a recent Italian study⁷. Given these findings, the WHO resolution for releasing COVID-19 patients from isolation seems reasonable to avoid unnecessary social burden⁸.

Declaration of Competing Interest

The authors don't have any conflict of interest.

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