

Journal Pre-proof

Lower detection rates of SARS-COV2 antibodies in cancer patients vs healthcare workers after symptomatic COVID-19

M.L. Solodky, C. Galvez, B. Russias, P. Detourbet, V. N'Guyen-Bonin, A.-L. Herr, P. Zrounba, J.-Y. Blay

PII: S0923-7534(20)39793-3

DOI: <https://doi.org/10.1016/j.annonc.2020.04.475>

Reference: ANNONC 175

To appear in: *Annals of Oncology*

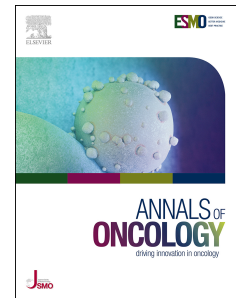
Received Date: 24 April 2020

Accepted Date: 28 April 2020

Please cite this article as: Solodky ML, Galvez C, Russias B, Detourbet P, N'Guyen-Bonin V, Herr AL, Zrounba P, Blay JY, Lower detection rates of SARS-COV2 antibodies in cancer patients vs healthcare workers after symptomatic COVID-19, *Annals of Oncology* (2020), doi: <https://doi.org/10.1016/j.annonc.2020.04.475>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2020 Published by Elsevier Ltd on behalf of European Society for Medical Oncology.



Letter to the Editor

Lower detection rates of SARS-COV2 antibodies in cancer patients vs healthcare workers after symptomatic COVID-19

M. L. Solodky¹, C. Galvez¹, B. Russias¹, P. Detourbet¹, V. N'Guyen-Bonin¹, A.-L. Herr¹, P. Zrounba¹, J.-Y. Blay^{1-3*}

Affiliations:

1. Centre Léon Bérard Cancer Center, Lyon, France.
2. Université Claude Bernard Lyon I
3. Unicancer, Paris, France

*: Correspondence: Prof J.-Y Blay, Department of Medical Oncology, Centre Léon Bérard, 28 rue Laënnec, 69373 Lyon Cedex 08, & Université Claude Bernard Lyon I France. Tel: +33 (0)4 78 78 51 26, jean-yves.blay@lyon.unicancer.fr

Funding: NetSARC (INCA & DGOS) and RREPS (INCA & DGOS), RESOS (INCA & DGOS) and LYRICAN (INCA-DGOS-INSERM 12563), Association DAM's, Eurosarc (FP7-278742), la Fondation ARC, Infosarcome, InterSARC (INCA), LabEx DEvweCAN (ANR-10-LABX 0061), PIA Institut Convergence Francois Rabelais PLAsCAN (PLASCAN, 17-CONV-0002), Ligue de L'Ain contre le Cancer, La Ligue contre le Cancer, EURACAN (EC 739521) funded this study.

The diagnosis of COVID-19 is based on the detection of the SARS-COV2 virus using RT-PCR from nasopharyngeal samples at the time of active infection (1-3). Most patients infected with SARS-COV2 develop antibodies (Ab) against SARS-COV2 proteins (1-3). The survival of cancer patients presenting with RT-PCR+ COVID-19 has been reported to be very poor, with up to 30% mortality at 30 days (4,5).

In this work, we retrospectively analyzed cancer patients presenting with a suspicion of COVID-19 from March 1st 2020 to April 16th 2020 as part of an Institutional Review Board approved clinical trial (Oncovid-19, approved 12 March 2020) and a series of health care workers (HCWs, nurses and doctors) as part of a voluntary testing procedure in the Centre Leon Berard.

All 85 cancer patients were tested both with SARS-nCoV2 RT-PCR on nasopharyngeal samples and a point-of-care Ab diagnostic test, Toda Coronadiag® (TODA Pharma, Strasbourg France). Coronadiag® is a rapid lateral flow immunoassay (LFIA) providing results in 10 min using a finger-pricked blood sample. This test was performed 15 days or more after a positive RT-PCR or COVID-19 symptoms. The LFIA test was performed in all 244 HCWs. In addition, SARS-CoV2 RT-PCR was found positive previously (>15d) in 14 HCW presenting with clinical symptoms, and was performed in the 3 HCWs testing positive for SARS-COV2 Ab.

Ten of 85 (12%) of cancer patients had documented SARS-CoV2 on RT-PCR, and 5 (6%) had a positive Ab detection test. Three of the 10 (30%) RT-PCR-confirmed infected patients had detectable Ab anti SARS-

COVID-19 15 days after the clinical start of the infection. Two of the 75 (2.3%) remaining cancer patients screening negative for RT-PCR had detectable SARS-CoV-2 IgG.

In parallel, all 244 HCWs were tested with the LFIA test, including 14 with a RT-PCR-documented SARS-CoV-2 infection: 10 of these 14 (71%) RT-PCR-confirmed infections had detectable Abs 15 days or later after clinical symptoms. Three of the remaining 230 (1.3%) HCWs had detectable Ab but a negative test for RT-PCR performed at the same time. Two of these reported possible COVID-19 symptoms in the previous weeks.

The rate of seroconversion 15 days after documented SARS-CoV-2 on RT-PCR was therefore significantly lower in cancer patients vs HCWs (30% vs 71%, $p=0.04$). Importantly, 6 of the 7 serodiagnostic-negative cancer patients had received cytotoxic therapy or major surgical intervention in the previous 4 weeks, compared to none of the 5 remaining patients ($p=0.003$). None of these patients died.

In this series, 5 of 85 (5.9%) and 13 of 244 (5.4%) of cancer patients and HCWs, respectively, had detectable Ab against COVID-19. However, cancer patients had a significantly lower detection rate of SARS-CoV-2 antibodies 15 days or later after symptoms and RT-PCR+ testing. Anti-SARS-CoV-2 Abs were more often undetectable in patients receiving cancer treatments in the month prior to testing. Additional studies will be needed to confirm whether immune response to the virus is influenced by recent cancer treatments.

References:

- 1: Patel R, Babady E, Theel ES, Storch GA, Pinsky BA, St George K, Smith TC, Bertuzzi S. Report from the American Society for Microbiology COVID-19 International Summit, 23 March 2020: Value of Diagnostic Testing for SARS-CoV-2/COVID-19. *mBio*. 2020 Mar 26;11(2):e00722-20.
- 2: Vashist SK. In Vitro Diagnostic Assays for COVID-19: Recent Advances and Emerging Trends. *Diagnostics (Basel)*. 2020 Apr 5;10(4):E202.
- 3: Li Y, Yao L, Li J, Chen L, Song Y, Cai Z, Yang C. Stability issues of RT-PCR testing of SARS-CoV-2 for hospitalized patients clinically diagnosed with COVID-19. *J Med Virol*. 2020 Mar 26. doi: 10.1002/jmv.25786. Epub ahead of print.
- 4 : Liang W, Guan W, Chen R, Wang W, Li J, Xu K, Li C, Ai Q, Lu W, Liang H, Li S, He J. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol*. 2020; 21:335-337.
- 5: Zhang L, Zhu F, Xie L, Wang C, Wang J, Chen R, Jia P, Guan HQ, Peng L, Chen Y, Peng P, Zhang P, Chu Q, Shen Q, Wang Y, Xu SY, Zhao JP, Zhou M. Clinical characteristics of COVID-19-infected cancer patients: A retrospective case study in three hospitals within Wuhan, China. *Ann Oncol*. 2020 Mar 26:S0923-7534(20)36383-3.