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1674MO  ACE2 and TMPRSS2 expression by clinical, HLA, immune, and microbial correlates across 34 human cancers and matched normal tissues: Implications for SARS-CoV-2

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Background: Pandemic COVID-19 by SARS-CoV-2 infection is facilitated by the ACE2 receptor and protease TMPRSS2. Patients with cancer may be at particularly high risk for SARS-CoV-2 infection and deleterious outcomes to the disease. A better understanding of potential host risk factors, notably ACE2 and TMPRSS2, in malignant tissues may inform considerations surrounding SARS-CoV-2 and COVID-19 in patients with cancer and more broadly in the general population.

Methods: We performed a large-scale integrated study of ACE2 and TMPRSS2 gene expression in 10,038 patients with cancer across and within organ systems, by normal versus tumor. We investigated its correlative pattern with clinical factors (age, gender, race, BMI and smoking history, etc.), HLA, immune signatures, and commensal microbiome.

Results: Matched normal tissues generally display higher ACE2 and TMPRSS2 expression compared with tumor, with digestive organs expressing the highest levels. No consistent association was observed between clinical groups or HLA genotypes and ACE2/TMPRSS2 levels, after adjusting for tissue-specific expression. ACE2 expression showed a significant correlation with clinically relevant immune signatures including interferon-stimulated genes and the T cell-infiltrated phenotype, and with microbiome embedded single-cell RNAseq analysis demonstrated little to no ACE2 or TMPRSS2 expression in lymphocytes or macrophages. ACE2 and TMPRSS2 showed a distinctive correlative pattern with 75 bacterial taxa in normal tissues particularly from colorectal cancers (gram-negative to positive ratio = 2.6:1). LASSO regression models integrating multi-dimensional correlates revealed immune and microbiota are among the top-ranked features predictor to SARS-CoV-2 expression, while epithelial cell abundance is the dominant predictor for TMPRSS2.

Conclusions: We investigated ACE2 and TMPRSS2 expression across clinical, genetic, immune, and microbiome domains. We identify novel associations with the microbiota and confirm host immunity associations with gene expression. We hope these data may better inform clinical considerations surrounding risk stratification and prevention approaches.

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1675MO  Screening of COVID-19 disease based on chest CT and PCR for cancer patients undergoing radiotherapy in a French coronavirus hotspot

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Background: The coronavirus disease (COVID-19) pandemic has caused 180,000 confirmed cases in France with more than 28,000 deaths as of May 19. A large part of COVID-19 patients seem asymptomatic and cancer patients may be more vulnerable. We evaluated a screening strategy combining chest computed tomography (CT) and PCR for patients treated with radiotherapy (RT).

Methods: A screening strategy was organized from March 18, in our RT department. An inspiratory hold chest acquisition was proposed during the CT simulation for RT. Images was reviewed by a radiologist according to the CO-RADS classification. A nasal swab with a polymerase chain reaction (PCR) assay was proposed by the radiation oncologist in case of evocative imaging or clinical context. For patients who were already undergoing RT at this time, a PCR was proposed in case of evocative symptoms and before concomitant chemotherapy.

Results: From March 18 to May 1, 2020, 507 CT simulation were performed for 449 patients, including 445 chest acquisition. 237 of the chest CT (53%) showed lung abnormalities, of which 34 (8%) were COVID-19 compatible (CO-RADS > 3). 102 patients were tested by PCR after the CT scan of the 449 (5.3%) patients were considered as COVID-19 patients: 19 had positive PCR, and 5 were considered positive on the basis of imaging despite PCR-negative PCR. Four of the patients (1.7%) were diagnosed during RT: 3 on routine screening before chemoradiotherapy, and one on symptoms. Four patients needed several PCR for the diagnosis of COVID-19 with six confirmed false negative PCR (Sensitivity (Se) = 76 % (19/25)). Three PCR positive patients had no evocative lung images (Se = 84%). During this period, an additional 169 PCR tests were performed on asymptomatic patients (NNT: 2.6 vs. 10, with or without serological selection). At a very early follow up (8 wks), in 114 SARS-CoV-2-seropositive/RT-PCR-negative patients, who continued their anticancer therapies, none but one developed a symptomatic COVID-19 illness.

Conclusions: Among cancer patients, the two-step diagnostics strategy with serology followed by pharyngeal swab for asymptomatic or mildly symptomatic SARS-CoV-2 infection is feasible and effective and can help selecting cancer patients on treatment who might be silent carriers of the virus. The early safety outcome of patients previously exposed to SARS-CoV-2 supports the recommendation to continue active treatment, at least in the case of negative RT-PCR test.

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1676MO  COVID-19 mortality in hospitalized cancer patients is not significantly affected by chemotherapy or other anti-cancer treatments

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Background: Individuals with cancer, particularly those who are receiving systemic anti-cancer treatments, have been postulated to be at increased risk of mortality from SARS-CoV-2 related coronavirus disease (COVID-19). This conjecture has considerable impact on the treatment of cancer patients and large, multi-centre data to support this assumption is lacking due to the contingencies of the pandemic.

Results: From March 18, to May 1, 2020, 507 CT simulation were performed for 449 patients, including 445 chest acquisition. 237 of the chest CT (53%) showed lung abnormalities, of which 34 (8%) were COVID-19 compatible (CO-RADS > 3). 102 patients were tested by PCR after the CT scan of the 449 (5.3%) patients were considered as COVID-19 patients: 19 had positive PCR, and 5 were considered positive on the basis of imaging despite PCR-negative PCR. Four of the patients (1.7%) were diagnosed during RT: 3 on routine screening before chemoradiotherapy, and one on symptoms. Four patients needed several PCR for the diagnosis of COVID-19 with six confirmed false negative PCR (Sensitivity (Se) = 76 % (19/25)). Three PCR positive patients had no evocative lung images (Se = 84%). During this period, an additional 169 PCR tests were performed on asymptomatic patients (NNT: 2.6 vs. 10, with or without serological selection). At a very early follow up (8 wks), in 114 SARS-CoV-2-seropositive/RT-PCR-negative patients, who continued their anticancer therapies, none but one developed a symptomatic COVID-19 illness.

Conclusions: Among cancer patients, the two-step diagnostics strategy with serology followed by pharyngeal swab for asymptomatic or mildly symptomatic SARS-CoV-2 infection is feasible and effective and can help selecting cancer patients on treatment who might be silent carriers of the virus. The early safety outcome of patients previously exposed to SARS-CoV-2 supports the recommendation to continue active treatment, at least in the case of negative RT-PCR test.

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