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Long-Term Positivity and Reinfection of Sars-Cov-2 in Patient with Double Adenocarcinoma of Colon, Anal Carcinoma and Elevated Levels of Tumor Necrosis Factor (TNF): A War on Multiple Fronts in the Covid-19 Era

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Abstract

The SARS-CoV-2 pandemic has already infected more than 137 million people worldwide and resulted in 2.9 million deaths, and cancer is a major risk factor for death associated with COVID-19. The novel coronavirus pandemic currently torments world society and will do so until we have the entire vaccinated populations and/or effectives treatments [1]. To date public health measures have been the most effective method of controlling the pandemic. However, these measures have proved difficult to institute and are proving even more difficult to sustain. Effective vaccines for resistant variants may take years to deliver to large populations, meaning that we will likely see ongoing coronavirus disease 2019 (COVID-19) infections for many years. Although the majority of patients recover from infection without evident consequence, many die or suffer long-term disability. Consequently, there is an urgent need to find effective treatments that reduce mortality and limit COVID-19-related damage. It has been reported that a few conditions, including cancer, predispose individuals to SARS-CoV-2 infection and severe form of COVID-19, Long-Positivity and Reinfection. We report a case of a patient with Long-term Positivity, Reinfection with Adenocarcinoma of Colon and Anal Carcinoma with persistent respiratory failure from COVID-19 treated without Remdesivir.

Keywords: Adenocarcinoma of colon; TFN; Sars-Cov-2; Reinfection

Introduction

Our Italian patient 73-year-old, men, developed fever up to 38.4 degrees C, diarrhoea, asthenia, myalgia, dyspnoea and cough on 3 November 2020. In the Hospital he was admitted immediately after computed tomography (CT) imaging of his chest showed multiple and bilateral ground-glass opacities located in both subpleural and apico-basal spaces (especially on the right). Nasopharyngeal swab specimens were collected to detect severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) nucleic acid. The swab specimens were tested by real-time reverse transcriptase–polymerase chain reaction; a positive result was received 2 days later on 5 November 2020. Our patient was diagnosed with COVID-19 and not recommended treatment with Remdesivir for nephrotoxicity in elderly patient. He received 400 mg of moxifloxacin I.V daily for 3 days;O2 Therapy; methylprednisolone three i.v. boluses of 200mg; Tocilizumab was given in a single i.v. 400-mg dose ; prophylactic enoxaparin was prescribed (he no presented thrombotic events). The patient had a history of Arterial Hypertension, multifactorial anemia and double colon cancer. Adenocarcinoma of the right colon (pT2N0) and left Colon (pT3N0) and Adenocarcinoma (with stenosis) of

the anal canal. On April 2018 he was performed a surgery to remove the section of the colon containing the cancer (colectomy) and adjuvant chemotherapy. After eleven days chemotherapy and radiotherapy suspended for toxicity (radiodermatitis). The response to treatment was refractory. Our patient has been two months with a positive results to the swab specimens by real-time reverse transcriptase-polymerase chain reaction. This is a Case Study with Long Term Sars-Cov-2. On February 14, 2021, our patient was negative and she has after computed tomography (CT) imaging of her chest a complete resolution of bilateral areas of altered density a ground glass after treatment. On day six after your negativity, our patient developed abdominal pain, fever and increasing diarrhea, respiratory failure, diffuse arthro-myalgia, anosmia, ageusia. Biochemistry test indicated leucocytes 9.58 × 10 3c/µl (reference 4–11 × 103c/µl), D-dimer 3.3 µg/ml (reference 0.1–0.5 µg/ml), C-reactiveprotein 329 mg/l (reference 0–5 mg/l), procalcitonin 6.72ng/ml (reference 0–0.1 ng/ml), lactate dehydrogenase 316u/l (reference 135–225 u/l) and lactic acid 3.6 mmol/l (reference 0.5–1 mmol/l) and Tumor Factor Necrosis positive. The swab specimens were tested by real-time reverse transcriptase–polymerase chain reaction has been were positive (On February 20, 2021). Treatment with intravenous Tocilizumab, high flow O2 therapy with Ventimask, steroid, antibiotic, heparin for thromboembolic prophylaxis, (selective beta-2 adrenergic receptor agonist) long acting bronchodilator and and inhaled steroid, correction of hydro-electrolyte imbalance, blood transfusions (for multifactorial anaemia) was started. Computed tomography (CT) imaging of her chest have hightlighted multiple and bilateral ground-glass opacities located in both subpleural and apico-basal spaces. Is it probable that a "fragile condition" can cause TNF positivity (and therefore viral RNA FRAGMENTS?). Fortunately, after the maintenance of intensive medical treatment in hospital, On February 2, 2021, our patient was negative with resolution of symptoms covid-related (IgG positive, IgM negative) and he has after computed tomography (CT) imaging of her chest a complete resolution of bilateral areas of altered density a ground glass after treatment (Figure 1).

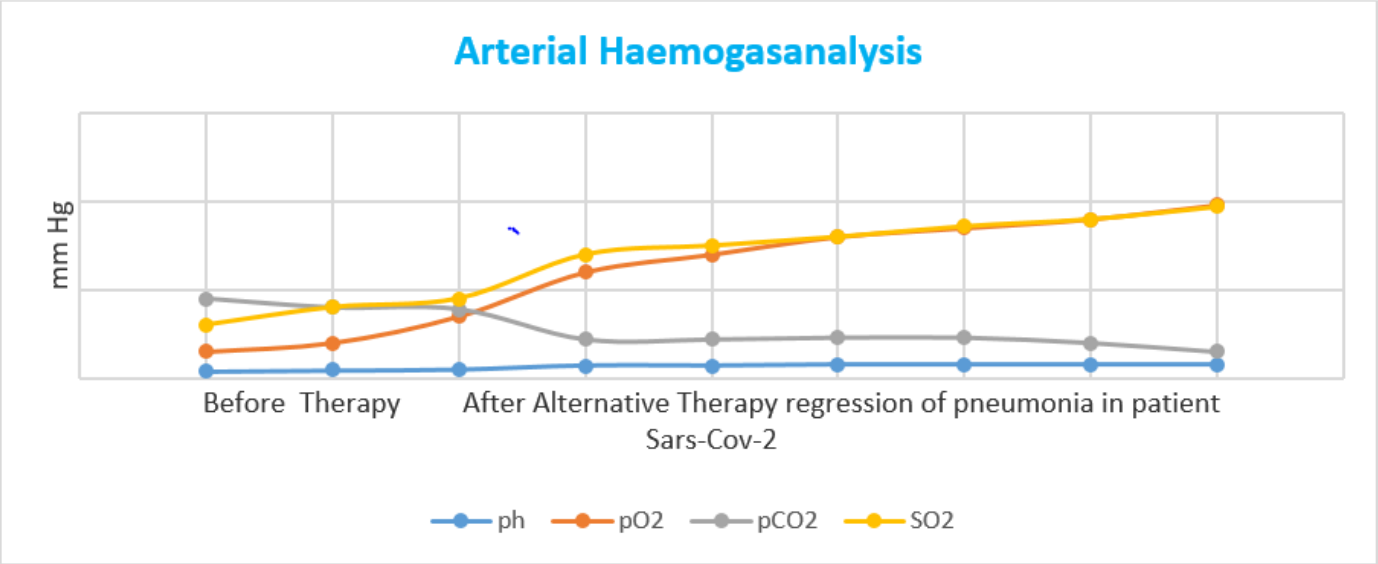

Figure 1: *Arterial haemogasanalysis.*

Discussion

We read with great interest the article regarding the higher risk of coronavirus disease 2019 (COVID-19) in patients with cancer compared with patients without a cancer diagnosis [2]. In their study, gastrointestinal cancer (20 patients; 18.7%) ranked as the second most common cancer diagnosis among a total of 107 patients with cancer who were diagnosed with COVID-19 a finding that has been of concern among gastrointestinal surgeons and physicians. The question of why patients with gastrointestinal cancer are more vulnerable, and whether other routes of infection exist in addition to respiratory transmission, should arouse our interest. In our patient elevated levels of Tumor Necrosis Factor (TNF), a key pro-inflammatory cytokine, colon cancer have been shown to be associated with increased hyper inflammation, severe respiratory failure, reinfection, and long-term positivity with Sars-Cov-2. The coronavirus spike protein helps the virus to enter the target cell through the angiotensin-converting enzyme 2 (ACE2) receptor. The transmembrane serine protease 2 (TMPRSS2) facilitates activation of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike protein and increases the chance of the virus entering the target cell [3]. The expression of ACE2 and TMPRSS2 in lung epithelium may increase the risk of SARS-CoV-2 infection and the severity of COVID-19 [4].

Clinical evidence has proven that SARS-CoV-2 uses ACE2 as a viral receptor for entry into the gastrointestinal system, and therefore higher levels of gene expression predict a greater chance of infection. High levels of ACE2 and TMPRSS2 were found in the human gastrointestinal tract in addition to the respiratory tract [5,6]. ACE2 and TMPRSS2 expression in colorectal cancer tissues were statistically higher than those in normal tissues. There was no difference noted with regard to the levels of ACE2 and TMPRSS2 expression in colon and rectal cancer of different clinical stages, indicating that colorectal cancer of all clinical stages may be the undifferentiated target of SARS-CoV-2. Therefore, ACE2 and TMPRSS2 expression levels may be high in both tumor tissues and adjacent normal tissues in these patients. This distribution could further increase the possibility of SARS-CoV-2 invading and infecting patients with colorectal cancer. A recent study of 73 hospitalized patients with COVID-19 demonstrated that the feces of approximately 53.42% of these patients was positive for SARS-CoV-2 RNA. Another analysis suggested that approximately 44% of the community transmission of COVID-19 could have occurred prior to symptom onset in infected patients. During colonoscopy or colorectal cancer surgery, physicians or surgeons may need to prevent aerosol contamination from the creation of laparoscopic pneumoperitoneum, or intestinal secretions and fecal contamination from the disposal of intestinal tract and tumors, even in asymptomatic patients [7]. Therefore, gastrointestinal oncologists should raise awareness and vigilance regarding protection and actively take precautions to reduce the risk of infection from intestinal secretions and feces during and after examinations or surgeries in patients with colorectal cancer. Strict infection control measures should be enforced because gastrointestinal tumor surgery has a high risk of infection. Careful handling of intestinal tissue or tumor specimens should be practiced to reduce the risk of transmission caused by intestinal infection and to prevent nosocomial infections [8]. In addition, regardless of their clinical stage of disease, patients with colorectal cancer may be at high risk of contracting COVID-19 and are the crucial protection targets in epidemic prevention. Although further validation of clinical data is needed, these findings are of practical importance: patients with clinically mild or moderate COVID-19 with a diagnosis of colorectal cancer should be given special attention because of a possible longer course of disease or a higher risk of severe infection probability.

Conclusion

It is plausible that patients with colon adenocarcinoma and anal carcinoma are more likely to be infected with SARS-CoV-2 and experience severe injury, long-term positivity, and reinfection. In addition, COVID-19 would bring unfavourable survival outcomes of colon cancer patients through the related immune cell infiltration process. This Case Report highlights the importance of preventive actions for colon cancer patients during the COVID-19 pandemic. We can hope to provide adequate clinical care and urgently design interventional studies to prevent Sars-Cov-2 infection in the patient with colon adenocarcinoma and anal carcinoma because the mortality associated with this devastating pandemic is dramatically high. Elevated levels of tumor necrosis factor (TNF), a key pro-inflammatory cytokine, in patients with colon cancer have been shown to be associated with increased hyper inflammation, severe respiratory failure, reinfection, and mortality when co-infected with Sars-Cov-2.

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