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Review Article

Infection of Patients with Liver Transplantation with COVID-19

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Abstract:

Severe acute respiratory syndrome or SARS, is a clinical disease of infectious etiology that has recently been reported in the literature [1]. Thought to have first originated in Guangdong Province in China, the illness has spread rapidly to numerous other parts of the world, including Asia, North America, and Europe [2].

Keywords: liver transplantation; severe acute; respiratory syndrome

Introduction

Severe acute respiratory syndrome or SARS, is a clinical disease of infectious etiology that has recently been reported in the literature [1]. Thought to have first originated in Guangdong Province in China, the illness has spread rapidly to numerous other parts of the world, including Asia, North America, and Europe [2]. The World Health Organization (WHO) identifies suspected and probable SARS cases on the basis of clinical and epidemiologic case definitions [3]. A suspect case includes fever with cough and either exposure to a suspect or probable case of SARS in the 10 days prior to illness onset, history of travel to an area affected by SARS, or residing in an affected area. A probable case includes the above with chest radiograph infiltrates. The incubation period ranges from 2 to 11 days, and illness typically begins with fever, headache and myalgias, which may progress to lower respiratory tract symptoms that in some cases require mechanical ventilation. The agent of SARS has been speculated to be a novel coronavirus and is likely transmitted via droplets [4–6].

Materials and Methods

At the end of December 2014, in the Batumi Referral Hospital of the Autonomous Republic of Adjara, the first successful liver transplant operation was performed in Georgia. To date, more than 88 surgical interventions have been performed, which revealed both positive and negative aspects of this operation. At the same time, recently there was a COVID-19 pandemic in Georgia and all over the world, and based on this, it is interesting to see how liver transplant patients are infected with COVID-19, and therefore we feel obliged to share our experience with the medical community, because our hospital has the largest material on this topic. As it is known, liver transplantation in Georgia started about 9 years ago and there are more than 120 liver transplant patients in Georgia as a whole. Here we would like to mention the fact that since the beginning of the pandemic, 42 surgeries have been performed and none of the mentioned patients are infected. Since the beginning of the pandemic, all fields of medical activity, especially transplantology, have faced great difficulties, since the stoppage of the said field was equivalent to the death of many people, based on the above, a special protocol was developed by doctors, taking into account the unconditional protection of which the mentioned operations are performed today. The protocol, developed by different transplant teams of South Korea and India (including our active participation), consists of the following criteria:

1. Two days before, the operation block, where liver transplantation is performed, is closed;
2. The recipient and the donor are placed in specially designated rooms, where they are tested twice by polymerase chain reaction (PCR)
3. The medical personnel participating in the mentioned surgical intervention shall undergo PCR testing before the operation;
4. Regardless of the duration of the operation, the personnel who are in the operating block are not allowed to leave the operating room and come into contact with other employees until the end of the operation.
5. After the operation, the patient is placed in the intensive care unit, which is isolated from other patients, and only medical personnel specially designated for them, who are equipped with the appropriate form, interact with them;

6. It is forbidden to contact relatives and friends of the donor and the recipient;

The first liver transplant co-infected patient was identified in the United States of America in March 2020, and we had such a patient in Georgia in October We had 17 liver transplant patients infected with COVID-19. As you know, the mentioned contingent lives in different parts of Georgia, therefore, during the period of their infection, we had to visit them in different clinics, for which a special consultation was created, which included: a transplant surgeon, a hepatologist, a gastroenterologist, an infectious disease specialist, a therapist and an immunologist, who studied how the clinical picture of the disease progressed. Only one patient died due COVID-19 infection

Discussion

As you know, during this period there was some confusion among the medical staff, because they were faced with the necessity of solving new tasks. Several dozen articles were also searched for this purpose, as well as we had communication with our foreign colleagues, who were actively treating liver transplant patients, and we conducted active consultations with them.It is known that in patients with chronic liver disease, the post-infection period with COVID-19 is difficult and the mortality rate is high, which cannot be said for liver transplant patients.Dozens of scientific articles have been reviewed and various clinical trials have been studied, suggesting that one of the targets of the new corona virus was the liver. The infectious agent uses receptors to invade the cell, which are found in the liver as well, and is manifested by the violation of the liver function tests (LFTs).Changes in LFTs could be due viral infection. However, we can also consider the result of a strong response of the immune system to the virus or even the result of hepatotoxicity of drugs used against Covid-19. These disorders are generally transient, mild in nature and do not require specific treatment, and cases of severe, acute hepatitis are very rare.The following forms of liver damage with Covid-19 are distinguished: hepatocellular, cholestatic and mixed type. Patients with a 3-fold increase in alanine transaminase (ALT) and/or aspartate transaminase (AST) are normal or fixed at the upper limit, classified as hepatocyte type. Patients with alkaline phosphatase (ALP) or gamma-glutamyl transferase (GGT) more than twice upper limit normal are classified as cholestatic type, while mixed type patients have the above mentioned parameters.The main goal was to observe the forms of the course of COVID-19 and describe the clinical picture of their course in patients with liver failure, while we considered it necessary to develop optimal management methods. Also, we conducted a general review of the effect of immunosuppressive drugs in infection with COVID-19.COVID-19 has a three-phase course in liver transplant patients [7]. In the first stage, patients have mild respiratory symptoms; The second is aggravated [8] In the mentioned phase, the respiratory symptoms, compared to the previous phase, are with addition of abdominal symptoms.The third phase is the most severe condition, since a systemic syndrome is formed at this time. However, patients in this cohort have high levels of cytokines such as interleukin IL-2, IL-6, IL7. [9]. Various articles discuss the use of immunosuppressive drugs for the prevention and treatment of the hyperinflammatory phase of COVID-19, although this drugs inhibit the host's immune response against the virus as well, thus they may be harmful in the early stages of COVID-19. However, this is still a matter of debate. Among the mentioned patients, we have one patient who was infected with COVID-19 twice, the first time in November 2020 and the second time in August 2021. At the beginning of the infection with COVID-19, he had all the symptoms, if any symptoms are observed at this time. Placing the patient in the clinic caused passion among the medical staff, because the patient had a transplanted liver. It is known that the said contingent is constantly receiving immunosuppressants. The first three infected patients were placed in clinics, in specialized wards, and the following tests were performed on them:

1. Complete Blood Count + Diff.

2. D-dimer;

3. Determination of hemostasis indicators;

4. determination of electrolytes;

5. determination of liver functional samples;

6. determination of urea, creatinine;

7. Tacrolimus concentration determination;

8. Liver Function tests;

9. C-reactive protein;

10. determination of IL interleukin;

11. Determination of intravenous immunoglobulin (IVIG);

12. determination of a-fetoprotein;

13. Computerized tomography study.

We can divide the patients infected with COVID-19 studied by us into three groups

1. 4 patients who had COVID-19 without any symptoms and therefore clinical-diagnostic indicators were within the norm;

2. 7 patients had dyspeptic events;

3. The remaining 5 patients with dyspeptic symptoms had the following symptoms: periodic cough without sputum, temperature 37.2-37.8 for three days, decreased sense of smell, insomnia. Also, the patients included in the third group had the following changes

4. Only 1 patient succumbed to infection

1. ALT-83
2. AST-75
3. GGT-102
4. ALP-168
5. TBIL-24
6. DBIL-0,9
7. Indicators of hemostasis are within the norm, no infiltrative changes are observed in the CT study, tacrolimus is within the norm
8. Antibiotic therapy was not used in any of the 17 infected patients

Eighteen articles reporting 1,522 COVID-19 infected LT recipients were included for the systematic review. The mean age (standard deviation [SD]) was 60·38 (5·24) years, and 68·5% were men. The mean time (SD) to COVID-19 infection was 5·72 (1·75) years. Based on 17 studies (I^2 = 7·34) among 1,481 LT recipients, the cumulative incidence of mortality was 17·4% (95% confidence interval [CI], 15·4–19·6). Mortality was comparable between LT (n = 610) and non-LT (n = 239,704) patients, based on four studies (odds ratio [OR], 0·8 [0·6–1·08]; P = 0·14). Additionally, there was

no significant difference in mortality between those infected within one year vs after one year of LT (OR, 1·5 [0·63–3·56]; $P = 0·35$). The cumulative incidence of graft dysfunction was 2·3% (1·3–4·1). Nearly 23% (20·71–25) of the LT patients developed severe COVID-19 infection. Before infection, 71% and 49% of patients were on tacrolimus and mycophenolate mofetil, respectively. Immunosuppression was modified in 55·9% (38·1–72·2) patients after COVID-19 infection [11]. Since the beginning of the pandemic, many studies have been conducted. In liver transplant patients infected with COVID-19, in order to reduce the virulence of the virus, it is envisaged to use immunosuppressants in the mentioned period, in terms of reducing the cytotoxic strain of the virus. However, in the 17 patients studied by us, it is clearly established that this contingent is constantly receiving immunosuppressive drugs, therefore, they easily passed the period of infection with COVID-19. In conclusion, clinical data on COVID-19 infection in transplant population is still very limited. In present case, recovery after having severe COVID-19 pneumonia may depend on normalization of immunity. Temporary withdrawal of immunosuppression and administration of corticosteroid in low-dose might be principle components of therapeutic regime. Nevertheless, success of a single positive case indeed does not represent the rationality and necessity of complex strategy. Additional data from immunosuppressed cases need to be collected to further recognize the clinical features of COVID-19 in transplant recipients [12].

Conclusion

Successful transplantation of organs from donors with COVID-19 infection is feasible. Appropriate donor and recipient selection and risk assessment is essential and long term follow up to rule out any transmittable risks of donor derived infection. With 4 patients in the first group, who had COVID-19 without any symptoms, the basis for taking a PCR test was the infection of their family members.

References

1. Kumar D, Tellier R, Draker R, Levy G. Humar A Severe Acute Respiratory Syndrome (SARS) in a Liver Transplant Recipient and Guidelines for Donor SARS Screening.
2. World Health Organization. Cumulative Number of Reported Cases of Severe Acute Respiratory Syndrome (SARS).
3. World Health Organization. Case Definitions for Surveillance of Severe Acute Respiratory Syndrome (SARS).
4. Peiris JSM, Lai ST, Poon LLM et al. Coronavirus as a possible cause of severe acute respiratory syndrome. Lancet.
5. Ksiazek TG, Erdman D, Goldsmith C et al. A novel coronaviruses associated with severe acute respiratory syndrome. N Engl J Med.
6. Drosten C, Gunther S, Preiser W Et al. Identification of a novel coronavirus in patients with severe acute respiratory syndrome. N Engl J Med.
7. Arvinder Singh Soin, Sanjiv Saigal, Subash Gupta, et al. Liver transplantation and COVID-19 (Coronavirus) infection: guidelines of the liver transplant Society of India (LTSI)
8. Hasan K. Siddiqi, Mandeep R. Mehra, COVID-19 illness in native and immunosuppressed states: A clinical–therapeutic staging proposal
9. Shaobo Shi, Mu Qin, Bo Shen et al. Association of Cardiac Injury With Mortality in Hospitalized Patients With COVID-19 in Wuhan, China
10. Xiaoming Hung, Shuai Zhang, Lei Lei, et al. Comparison of Prevalence and Associated Factors of Anxiety and Depression Among People Affected by versus People Unaffected by Quarantine During the COVID-19 Epidemic in Southwestern China
11. Anand V. Kulkarnia, Harsh Vardhan Tevethiaa, Madhumita Premkumarb et al. Impact of COVID-19 on liver transplant recipients -A systematic review and meta-analysis
12. Bin Liu, Yangzhong Wang, Yuanyuan Zhao et al. Successful treatment of severe COVID-19 pneumonia in a liver transplant recipient