

Case Report

The Prophylactic Treatment of COVID-19 in A Renal Failure and Hodgkin Lymphoma Patient with Convalescent Plasma

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Abstract

COVID-19 is a viral infectious disease that is thought to have emerged from an animal market in Wuhan, People's Republic of China, in December 2019, and subsequently caused a pandemic. Despite the fact that 1 year has passed since the onset of the epidemic and many treatment agents have been tried, there is still no approved treatment. Convalescent plasma therapy is a passive immunization method and holds promise in the treatment of COVID-19. In this study, we observed that asymptomatic COVID-19 infection was effectively treated with convalescent plasma in a young patient with a diagnosis of Hodgkin lymphoma, acute renal failure also who received R-DHAP (Rituximab – Cisplatin – Cytarabine-Dexamethasone) chemotherapy treatment. We think that this treatment may be more effective when it started in earlier stage of disease in asymptomatic patients.

Keywords: Covid 19; Lymphoma; Renal Failure; Convalescent Plasma

Introduction

In the last 2 decades, infections belonging to the corona virus family have led to outbreaks. From them, SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome) caused fear in 2002 and 2012 but the main pandemic was SARS-CoV-2 (Severe Acute Respiratory Syndrome Corona virus 2) who is a new member of the corona virus family. He made it under the name of COVID-19 [1].

Convalescent plasma therapy is a passive immunization method which an effective and reliable treatment was used more than 100 years for various infectious disease and holds promise in the treatment of COVID-19 [2]. Because of the lack of B- and T-cell-derived immunity, immunosuppressed patients may benefit more from convalescent plasma treatment [3]. Here, we report the rapid and effective treatment of COVID-19 disease with convalescent plasma that develops in our patient with Hodgkin lymphoma who infected shortly after her chemotherapy.

Despite the fact that 1 year has passed since the onset of the epidemic and many treatment agents have been tried, there is still no approved treatment [4]. Although the difficulties in treating immunocompetent individuals still remains, also effort in developing treatment modality continues in immunosuppressed individuals, especially in patients with hematological malignancies.

Case Report

A 22-year-old female patient received 6 cycles of ABVD (Adriamycin-Bleomycin-Vinblastin-Dacarbazine) treatment with the diagnosis of Hodgkin Lymphoma 2 years ago. She was followed up in remission until to October 2020. R-DHAP

(Rituximab – Cisplatin – Cytarabine-Dexamethasone) chemotherapy was started due to recurrence in the patient. In the second cycle of the treatment, drug-induced nephrotoxicity developed in the patient and she received hemodialysis and renal replacement therapy for 6 times. She was referred to our clinic for hematopoietic stem cell transplantation. She was admitted to our service and the COVID PCR test was sent from the nasopharyngeal swab sample in accordance with our transplant protocol. Because of the positivity of her test, Favipiravir treatment was initiated to the asymptomatic patient. Serum immunoglobulin levels measured and IgA deficiency did not detected. COVID convalescent plasma therapy was administered. First, antibody titer of the convalescent plasma donor was measured. Plasma was collected from the donor with an IgG level above 1/320.200 cc plasma was administered in 15 minutes and there was no complication. The patient was followed up in the COVID ward. Renal replacement therapy of the patient was continued in this place. In the follow-up, intravenous meropenem 3x1000 mg / day treatment was started. On the 7th day of the convalescent plasma treatment, the COVID PCR test which was taken from the nasopharyngeal swab sample became negative. It is planned to continue autologous stem cell transplantation procedure after recovery of kidney function. The table below shows the patient's results before and after convalescent plasma.

Discussion and Conclusion

The treatment of COVID-19 in immunosuppressed patients is still a mystery. Increased mortality and morbidity is an expected result in patients with hematological malignancies and solid organ transplantation [3]. It is obvious that in patients with

Examination Name (Unit)	Normal value	02.12.2020	09.12.2020
White Blood Count (10 ³ /uL)	4,3-10,3	7,79	12,51
Red Blood Count (10 ⁶ /uL)	4,38-5,77	3,78	3,59
Hemoglobin (g/dL)	13,6-17,2	10,10	9,7
Hematocrit (%)	39,5-50,3	30,0	28,8
Mean Corpuscular Hemoglobin (pg)	27,2-33,5	26,7	27
Mean Corpuscular Hemoglobin Concentration (g/dL)	32,7-35,6	33,7	33,7
Lymphocyte (%)	19,4-44,9	8,7	8
Monocyte (%)	5,1-10,9	30,8	10,2
Neutrophil (%)	41-76	59,4	81
Eosinophil (%)	0,9-6	0,3	0
Basophil (%)	0,3-1,5	0,8	0,8
Basophil (10 ³ /uL)	0-0,2	0,06	0,1
Eosinophil (10 ³ /uL)	0-0,5	0,02	0
Neutrophil (10 ³ /uL)	2,1-6,1	4,63	10,14
Monocyte (10 ³ /uL)	0,3-0,9	2,4	1,27
Lymphocyte (10 ³ /uL)	1,3-3,5	0,68	1
Mean Corpuscular Volume (fL)	80,7-95,5	79,4	80,2
PlateletCount (10 ³ /uL)	156-373	86	145
Glucose(mg/dL)	70 - 100	79	92
BUN (mg/dL)	7 - 18,7	20,88	69,64
Creatinine (mg/dL)	0,57 - 1,25	8,81	5,66
Uric Acid (mg/dL)	2,6 - 6	6,36	6,57
Total Protein (g/dL)	6,4 - 8,3	5,8	5,7
Albumin (g/dL)	3,5 - 5	2,9	2,9
Total Bilirubin (mg/dL)	0,2 - 1,2	0,48	0,33
Direkt Bilirubin (mg/dL)	0 - 0,5	0,27	0,19
AST (U/L)	5 - 34	31	46
ALT (U/L)	0 - 55	27	71
ALP (U/L)	38 - 155	90	106
GGT (U/L)	9 - 36	47	81
Magnesium (mg / Dl)	1,6 - 2,6	1,83	1,67
LDH (U/L)	125 - 243	2056	882
Amylase (U/L)	25 - 125	26	47
Lipase (U/L)	8 - 78	101	34
Sodium (mmol/L)	136 - 145	138	138
Chlorine (mmol/L)	98 - 107	101	103
Potassium (mmol/L)	3,5 - 5,1	3,84	4,32
Calcium (mg/dL)	8,4 - 10,2	8,9	9,7
Phosphorus (mg/dL)	2,3 - 4,7	2,1	6,5
C Reactive Protein (mg/dL)	0-0,351	10,8	1,59
IL-6 (pg/mL)	0-7	34,420	8,01
Ferritin (ng/mL)	10-291	1650	1650
Fibrinogen (mg/dL)	150-350	543,12	221,27
INR	0.8-1,2	1,19	
PTZ (second)	10-14	14,2	
APTT (second)	24,6	23-35	
COVID-19 PCR		POSITIVE	NEGATIVE

hematological malignancies, both innate and humoral immunity weaken due to the primary disease and the agents used in disease treatment. Currently, there is no standard treatment for COVID-19. The agents used are mostly antiviral drugs such as favipravir, remdesivir, lopinavir-ritonavir, oseltamivir. Immune convalescent plasma therapy is a promising treatment in this respect. The use of convalescent plasma is recommended in patients with solid organ transplantation, hematological malignancy and low immunity [5]. Adding to this, it is advised that antiviral therapy and convalescent plasma treatments are used in combination [6]. When the current literature is reviewed, it has been observed that convalescent therapy is mostly used in patients with advanced stage, such as acute respiratory distress syndrome [7,8]. Data on the use of convalescent plasma in the

treatment of hematological cancer patients with COVID-19 infection is very limited. However, it has been reported as an effective and safe treatment [5]. Similar to our case, convalescent plasma can be used as a safer treatment in patients with comorbidities such as kidney failure and in which not all drugs can be used.

In a study of 17 patients receiving anti-B-cell treatments, it was reported that the effectiveness of convalescent plasma treatment emerged in a short period of 1 week [9]. In the result of Senefeld's work, within 48 hours of convalescent plasma transfusion the majority of 54 patients who have hematological malignancies demonstrated improved clinical status and viral clearance [10]. In addition, it was reported that the convalescent plasma administered in a non-Hodgkin Lymphoma patient

who was seronegative and whose complaints continued even 88 days of viral meeting. After the onset of plasma his complaints relieved immediately [11]. In another case, convalescent plasma was transfused a patient who was on the day 20 of hospitalization. Following this treatment, the patient became independent of ECMO within one day and was successfully weaned from mechanical ventilation within two days [12]. In addition, a report of 16 patients in USA says steady improvement in oxygenation levels was observed following each convalescent plasma infusion. All of the 5 intubated patients were extubated between 1- and 19-days post convalescent plasma infusion. The remaining 11 showed a dramatic decline in oxygen needs and did not require ventilatory support [13].

We observed that asymptomatic COVID-19 infection was effectively treated with convalescent plasma in a young patient with Hodgkin lymphoma, acute renal failure and who received anti CD-20 therapy. As stated in some studies in the literature, we saw that our patient turned negative for the COVID-19 PCR test within 1 week [14]. When it was given inside of the 72 hours of admission, convalescent plasma recipients <65 years had 4-fold lower mortality and 4-fold lower deterioration in oxygenation on severe Covid-19 patients [15]. In another 3 studies, it was stated that when convalescent plasma is used at an average of 44 and 72 hours, it reduces mortality on the elderly patients. It should be used in the early period especially before cytokine storm begins [16-18]. In the meta-analysis of 17 studies, 5 of which were randomized, it was reported that the mortality rates of patients who received convalescent plasma were significantly lower than those who did not [19]. FDA (United States Food and Drug Administration) announces best outcomes occur in those who receive a high-titer unit of convalescent plasma within 3 days of COVID-19 diagnosis or admission to the hospital [20]. We think that the clinical improvement of the patient situation may be due to other drugs used in combination with convalescent plasma. Convalescent plasma can be used as an additive therapy agent in such patients where there is no standard treatment and the mortality rate is high due to the underlying disease. Finally, this treatment may be more effective in asymptomatic and immunosuppressed patients when it is given as soon as they are diagnosed.

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