An Overview of COVID-19 Treatment Method and their Adverse Effects

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Abstract

Coronaviruses are a group of viruses that can cause illness in mammals and birds. An acute respiratory disease, caused by a novel coronavirus, has spread throughout China and received worldwide attention. As of 1 April 2020, a total of 912,307 confirmed cases globally, 81,554 confirmed in China and 830,753 outside of China, with 45,541 deaths (4.99%) had been reported by WHO. Those who are infected with COVID-19 may have little to no symptoms. You may not know you have symptoms of COVID-19 because they are similar to a cold or flu. Symptoms may take up to 14 days to appear after exposure to COVID-19. This is the longest known incubation period for this disease. Symptoms have included: Cough, fever, pneumonia in both lungs and a small population of patients appeared gastrointestinal infection symptoms. COVID-19 can be diagnosed similarly to other conditions caused by viral infections: Using a blood, saliva, or tissue sample. However, most tests use a cotton swab to retrieve a sample from the inside of your nostrils. Positive CRP and Lymphopenia is a common feature in the patients with COVID-19 and might be a critical factor associated with disease severity and mortality. X-ray images showed a rapid progression of pneumonia. Results imply that over activation of T cells manifested by increase of Th17 and high cytotoxicity of CD8 T cells, accounts for, in part, the severe immune injury in this patient. The purpose of this study is to summarized the articles which are published as of late march 2020 on the clinical treatments, symptoms, and medications adverse effect.

Keywords: COVID-19; Gastrointestinal infection; Lymphopenia

Introduction

Coronaviruses (CoVs), a large family of single-stranded RNA viruses, can infect animals and also humans. The type of pneumonia caused by the 2019 novel Coronavirus Disease (COVID-19) is a highly infectious disease. In late December 2019, several local health authorities reported clusters of patients with pneumonia of unknown cause, which was epidemiologically linked to a seafood market in Wuhan, Hubei Province, China. On 30 January 2020, the World Health Organization (WHO) declared that COVID-19 is a public health emergency of international concern [1]. It has rapidly spread across China and many other countries and the pandemic is escalating rapidly. Since the bases for the pathogenesis of this virus and its proliferation is unclear, there is still no vaccine or definitive treatment against it. That's why the quick introduction of drugs that can be used to treat COVID-19 can be essential in the absence of the specific field treatment and definitive vaccine for COVID-19, it is very important to identify the disease at an early stage. We searched the associated literature in CoOVID-19 to summarize the potential treatments and their adverse effects. We reviewed published article until April 2020 using Pubmed and Google scholar search engine [2].

Description

Clinical reports on COVID-19 treatment mostly emphasized on empirical therapy and clinical experience during the treatments. In 2020 Wang et al. studied the effect of IFN-α efficacy. IFN-α is a broad-spectrum antiviral drug that could inhibit the synthesis of viral RNA. The combination of the IFN-α and ribavirin can reduce viral replication. IFN-α is available in Iv injection, nebulization and spray [3]. In another article the two-drug combination method is listed, Hydroxychloroquine and azithromycin as a treatment of COVID-19. Azithromycin added to hydroxychloroquine was significantly more efficient for virus elimination [4,5]. The following **Table 1** examines medications used in the treatment of the COVID-19 and compares their adverse effect. These kinds of side effects are not visible if this medications are taken in therapeutic doses [6].

Study	Medicine	Mechanism of action	Adverse effect
Wang et al. (2020)	IFNα	Inhibit the synthesis of viral RNA	Histories of mental illness, severe or unstable heart disease, or aplastic anemia
Wang et al. (2020)	Ribavirine	Could reduce viral replication	Hemolytic anemia

Wang et al. (2020)	Lopinavir/ritonavir	Protease inhibitor	Hyperlipidemia-Rash-Diarrhea
Richardson et al. (2020)	Baracitinib	Selective JAK inhibitor	Upper respiratory tract infections
Cortegiani et al. (2020)	Chloroquine phosphate	Reducing viral copy numbers in the cell supernatant and viral infection	Abnormal ECG- stomach cramp Methemoglobinemia-retinopathy
Philippe Gautret et al. (2020)	Hydroxychloroquine	Viral load reduction/disappearance	Mostly visual symptoms such as photophobia and blindness
Jaffar A. Al-Tawfiq et al. (2020)	Remdesivir	Decrease in viral RNA production	Since this medication had not been approved at the time of writing this article side effects have not yet been discovered
Remanshee Arya et al. (2020)	Formotrol-Chloroquine	Binding to SARS-CoV-2 papain-like protease	Chloroquine: Sameas above Formotrol: Viral infections
Yin wang et al. (2020)	Corticosteroids (methyl prednisolone)	Short term use in severe cases may decrease lungs inflammation	Secondary infections

Table 1: The medications used in the treatment of the COVID-19 and compares their adverse effect.

It is reported that the patients administration of moxifloxacin, lopinavir, and interferon to non-ICU patients and the addition of methylprednisolone to the above treatment for ICU patients resulted in 26 patients being discharged from Intensive Care Unit (ICU) and 16 patients being discharged from hospital [7,8]. On the other hand, while studying 416 COVID-19 patients, Shang et al. reported that corticosteroid therapy and gamma globulin administration increased mortality and appeared to be useful only in patients with lower lymphocyte counts [3,9]. According to the recent publications usage of corticosteroid in severe cases with a harsh stage of inflammation can be useful just for short term use. Tocilizumab is an Immunomodulating agent, mainly for the treatment of rheumatoid arthritis used in some protocols based on theoretical mechanisms and limited preliminary data as an adjunct therapy. However, no clinical study has demonstrated the effects of Tocilizumab on COVID-19 and further studies are indeed required. Convalescent plasma or immunoglobulins have been used as a last resort to improve the survival rate of patients with SARS whose condition continued to deteriorate despite treatment with pulsed methylprednisolone [10].

Conclusion

According to articles reviewed in cases of mild to moderate severity hydroxychloroquine is the best treatment option in the other hand adding azithromycin to hydroxychloroquine can also be more effective especially in people whose lungs are involved. In addition to the drugs currently prescribed to treat COVID-19, Arbidol hydrochloride, interferon, and Thalidomide plus Methylprednisolone can also be used due to their effects reported in clinical studies. Galidesivir which is also an anti-viral drug and adenosine analogue can also be effective against coronaviruses. Evidence suggests that no de initive cure has been found for the disease, but according to the articles, the most effective drug is hydroxychloroquine.

References

1. Wang Y, Zhu LQ (2020) Pharmaceutical care recommendations for antiviral treatments in children with coronavirus disease 2019. World J Pediatr 16: 271-274.

2. Gautret P, Lagier JC, Parola P, Meddeb L, Mailhe M, et al. (2020) Hydroxychloroquine and azithromycin as a treatment of COVID-19: Results of an open-label non-randomized clinical trial. Int J Antimicrob Agents 56: 105949.

3. Shang L, Zhao J, Hu Y, Du R, Cao B (2020) On the use of corticosteroids for 2019-nCoV pneumonia. The Lancet 395: 683-684.

4. Chen L, Xiong J, Bao L, Shi Y (2020) Convalescent plasma as a potential therapy for COVID-19. Lancet Infect Dis 20: 398-400.

5. Richardson P, Griffin I, Tucker C, Smith D, Oechsle O, et al. (2020) Baricitinib as potential treatment for 2019-nCoV acute respiratory disease. Lancet 395: e30.

6. Cortegiani A, Ingoglia G, Ippolito M, Giarratano A, Einav S (2020) A systematic review on the efficacy and safety of chloroquine for the treatment of COVID-19. J Crit Care 57: 279-283.

7. Al-Taw iq JA, Al-Homoud AH, Memish ZA (2020) Remdesivir as a possible therapeutic option for the COVID-19. Travel Med Infect Dis 34: 101615.

8. Chen YW, Yiu CP, Wong KY (2020) Prediction of the 2019-nCoV 3C-like protease (3CLpro) structure: Virtual screening reveals velpatasvir, ledipasvir, and other drug repurposing candidates. F1000Res 9: 129.

9. Cao B, Wang Y, Wen D, Liu W, Wang J, et al. (2020) A trial of lopinavir-ritonavir in adults hospitalized with severe COVID-19. N Engl J Med 382: 1787-1799.

10. Huang C, Wang Y, Li X, Ren L, Zhao J, et al. (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet 395: 497-506