

Chinese Drug can be Used in Combination with Monoclonal Antibody Medicines to Reduce the Side Effects of COVID- 19

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Abstract

The mortality rate of the recent global epidemic corona virus disease 2019(COVID- 19) is presently as high as 7%. The SARS- CoV- 2 contagion is the malefactor behind COVID- 19. SARS- CoV- 2 is an enveloped single- stranded RNA contagion; the genome encodes four types of the structural proteins S protein, E protein (envelope protein), M protein (matrix protein) and N protein (nucleocapsid protein). In COVID- 19, monoclonal antibodies have played a significant part in opinion and treatment. This composition compactly introduced the development of monoclonal antibodies targeting on S protein and N protein, which represents the main direction of monoclonal antibody medicines used in the opinion and treatment of COVID- 19. Meanwhile, the traditional Chinese drug also plays important part in the fight against COVID- 19 by regulating human immunity. The composition introduced the use of traditional Chinese drug in fighting against COVID- 19.

Keywords: COVID- 19; Mortality rate; Monoclonal antibodies; S protein

Introduction

The mortality rate of the recent global epidemic COVID- 19 is presently as high as 7. The SARS- CoV- 2 virus is the culprit behind COVID- 19. Cases infected with SARS- CoV- 2 always have severe acute respiratory pattern and Middle East respiratory pattern analogous to MERS- CoV [1]. Further seriously, COVID- 19 infection is accompanied by a severe seditious response caused by the release of inordinate cytokines similar as TNF- α , interleukins IL- 6 and IL- 1, performing in a so- called cytokine storm (CS). Therefore, a vigorous host vulnerable response that recruits macrophages [2], lymphocytes, neutrophils, and T cells against virus- infected cells leads to this hyperactive- seditious state. Worse, multiple organ failure and lung damage will be after that. Remedial strategies for managing COVID- 19 CS are anticipated to reduce contagion- related mortality and morbidity.

Monoclonal antibody (mAbs) is produced by instinctively set hybridoma cells. The product process can be summarized as injecting the antigen into the immunized beast to produce antibodies and also combining the antibody with myeloma cells to produce hybridoma cells [3], the performing hybridoma cells are screened, and the antibody- producing hybridoma cells are reproduced and amplified, and eventually purified to gain monoclonal antibodies [4]. Thus, mAbs are also defined as laboratory- produced molecules finagled to serve as substitute antibodies that can restore, enhance, or mimic the vulnerable system's attack on target cells by binding to antigens set up on the surface of cells.

Presently, 217 remedial antibody programs targeting COVID- 19 have entered the development stage. 133 programs target S protein which contains 3 groups of antibody curatives that have been approved by Emergency Use Authorization (EUA) for the treatment of COVID- 19 cases. 79 programs are in clinical trials (Phase I/ II/ III) of which 25 target the S protein [5]. 66 programs are in early stage, including 60 in preclinical stages. In conclude, at slightest 29 nations and 291 companies/ teach are creating counter acting agent treatments against the COVID- 19.

Monoclonal antibodies used on COVID- 19

The structure of the new coronavirus

SARS- CoV- 2 is an enveloped single- stranded RNA virus characterized by a shaft protein, the S protein, with a club- suchlike projection on the face of the virus. The SARS- CoV- 2 genome encodes four types of the structural proteins S protein, E protein (envelope protein), M protein (matrix protein) and N protein (nucleocapsid protein) [6]. The S protein on the face of SARS- CoV- 2 mediates the list and emulsion of the contagion with the host cell membrane receptor (Fig. 1). And the N protein is an RNA- binding protein with a high degree of stipulation and various activities in SARS- CoV- 2. As the most abundant protein helping the virus to infect cells, the N protein plays a necessary part in the infection and replication of SARS- CoV- 2 regarded as a structural protein that assembles viral genomic RNA into nucleocapsids and virions, and as a nonsupervisory protein that promotes viral transcription and replication and suppresses host ingrain vulnerable responses [7].

S protein- based monoclonal antibody drugs

The spike- suchlike S protein of SARS- CoV- 2 is the most important surface protein of the virus, determining the host range and particularity of SARS- CoV- 2. The S protein is also a crucial target for negating antibodies (NAbs) and vaccine design. The first step of SARS- CoV- 2's invading cells is the interaction of the S protein on the contagion face with the receptor on the face of the host cell. The S protein substantially completes the invasion process through the interaction of the RBD receptor with ACE2. However [8], the invasion of SARS-

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CoV- 2 can be effectively averted, if the process of the S protein's list to the ACE2 receptor could be effectively blocked. So utmost neutralizing antibodies target the receptor- binding epitope of RBD and produce a competitive inhibitory effect with the RBD receptor, therefore exerting a neutralizing effect

N protein- based monoclonal antibody drugs

The N protein, also known as nucleocapsid protein, has a high degree of sequence conservation and RNA chaperone exertion, which makes it an antagonist of interferon and an asset of virally- encoded RNA interference. The N protein is the main structure of the virus, which is an introductory protein composed of 419 amino acids and has a short lysine-rich protein [9]. The N protein is largely immunogenic and has smaller mutations over time than the spike and envelope proteins, which makes it a good target for discovery. After the virus infects human cells, the N protein will be expressed in large amounts which induce humoral and cellular immune responses.

Traditional Chinese drug in the treatment of COVID- 19

Chinese drug has been shown to be effective in the treatment of COVID- 19, and also plays an important part in relieving cases' early discomfort and reducing the rate of referral for serious illness. In China, cases with COVID- 19 have had good results at different stages of treatment with Chinese herbal compounds, either alone or in combination with western drugs.

According to the Pneumonia Treatment Protocol for Novel Coronavirus Infection, COVID- 19 is a plague in TCM, with the complaint located in the lung, and the pathogenesis can be epitomized as "dampness, heat, toxin and blood counterpoise". The clinical treatment in TCM can be divided into five stages the mild stage(cold-damp constraint in the lung pattern [10], damp- heat accumulation in the lung pattern); the moderate stage(damp- poison constraint in the lung pattern, cold-damp obstructing the lung pattern); the severe stage(epidemic poison blocking the lung pattern, blazing of both qi and yin pattern); the critical stage(internal blockage and external desertion pattern) and the recovery stage(lung- spleen qi insufficiency pattern, deficiency of both qi and yin pattern).

Conclusion

In the fight against the new coronavirus pneumonia — COVID-

19 pandemic, the effect of monoclonal antibody medicines is really remarkable, and the development prospect is undoubtedly auspicious. Still, its variability is good of attention at present for SARS- CoV- 2 is an RNA virus. It'll not be enough if the monoclonal antibody medicine only targets two structural proteins. In addition, there are also a large number of reports of serious side goods or severe vulnerable responses after monoclonal antibody remedy. Thus, monoclonal antibodies' threat assessment must be put on the agenda. Furthermore, whether monoclonal antibodies can have more accurate targeting and whether traditional Chinese drug can be used in combination with monoclonal antibody medicines to reduce the side effects are still needed to be explored.

Conflict of Interest

The authors declare that there are no conflict of interest.

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