

## Review: Stem Cell Based Therapy- Opportunity in COVID-19

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### ABSTRACT

On 2019 December, the first COVID-19 patient was detected in Wuhan, China. Currently, the world is still facing the pandemic. The novel virus associated with pneumonia. Coronaviruses are RNA single-stranded viruses. They are enveloped. This notorious virus is classified into : alpha (cause asymptomatic infections), beta, gamma and delta coronaviruses (subfamilies). The doctors use corticosteroids and antibiotics to reduce inflammation of various secondary bacterial infections. Mesenchymal stem cell (MSCs) can be used in the treatment of this virus because of their multipotent characteristic as well as their characteristic plasticity. In this paper we try to analyse the treatment for covid-19 with the help of characteristic feature of plasticity of stem cells including its multipotent character. The reason for this article is to survey the proof for the alternative treatment of SARS CoV -2 with the help of stem cell based theory.

**KEY WORDS:** STEM CELL, COVID-19, MSCS, SARS COV-2.

### INTRODUCTION

The outbreak of deadly virus covid -19 was declared as a global pandemic. This global pandemic was faced by the entire world in the early months of 2020, and is still spreading all over the globe threatening human life. World Health Organization (WHO) named as SARS-CoV-2 (virus). According to studies, the CoV genome has the largest known genome of RNA which is single stranded with positive envelope (1). SARS-CoV-2 belongs to the category of  $\beta$ -CoV subgroup and is considered by its heat and ultraviolet radiation sensitivity character. (Marahatta et al. 2020) Although the treatment protocols are not yet specified but due to studies of doctors, scientists it has been found high temperature is responsible for reducing the viral replication. Moreover, it is also able to withstand temperatures below 0 °C.

(Marahatta et al. 2020) Transmission of SARS-CoV-2 caused by sneezing, coughing or speech.

Potential threat is caused when there is prolonged exposure in confined spaces aerosols. Also, asymptomatic people contribute 80% of the virus transmission. Even the health care workers with symptoms like cough, fever, shortness of breath is also said to be a suspect. The people sharing close contact with the covid -19 suffering patient but without any symptoms or mild symptoms such as sore throat, light fever, no shortness of breath can also be suspected as a carrier. It is the responsibility of such people to self-quarantine with proper measures such as wearing mask with sanitizing themselves and even the things they have touched and the places where they stayed.

(Sgalla et al. 2018) In the patients with severe viral infection this virus can also cause hypoxic respiratory failure, which can be potentially turned into multi vital organ failure as the disease advances ultimately resulting in death. Such patients need to get admitted in the hospitals as soon as possible. Using electron microscopy it is found that, the virus is also found in the body organs like breast, heart, skin, lymph nodes.

Biosc Biotech Res Comm P-ISSN: 0974-6455 E-ISSN: 2321-4007



#### Identifiers and Pagination

Year: 2021 Vol: 14 No (6) Special Issue

Pages: 262-263

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DOI: <http://dx.doi.org/10.21786/bbrc/14.6.54>

#### Article Information

Received: 28<sup>th</sup> March 2021

Accepted after revision: 29<sup>th</sup> May 2021

### A short review: Stem cells in regenerative medicines

(Bian et al. 2020) Stem cells, have the ability to self-replicate and display the regenerative effect of various types of cells. (Desai et al. 2020 and Burhani et al. 2020) Stem cells, as per their ability to differentiate, are organized according to the following types of cells: pluripotent, totipotent, multipotent and unipotent. That's why stem cells can be used to fight against this deadly disease due to their characteristic like multipotency and plasticity. (Butola et al. 2020) Moreover, stem cells are divided into embryonic stem cells (ESCs), mesenchymal stem cells (MSCs), Wharton jelly mesenchymal stem cells (UCSC), bone marrow stem cells (BMSC), progenitor cells tissue-specific stem cells (TSPSCs) and induced pluripotent stem cells (IPSCs). Due to the regenerative capability of stem cells they are also divided on the basis of their transplantation into allogeneic, autologous and syngeneic. The plasticity of these cells gives an amazing stimuli to the cellular environment.

### 3. The Stem cells therapy for COVID-19

Many trials are conducted by researchers, doctors, scientist and pharmaceutical companies so that the MSCs are more and more applied in clinical use for the patients infected with SARS-CoV-2.

(Bawiskar et al. 2020) A research was conducted on virus infected patients in Beijing. They were given injections of umbilical cord stem cells. As a result to which MSCs started directly or indirectly started acting as an antibody, thus influencing immune response against the virus. The patients were observed for was 14 days in the hospital under the supervision of experts. The therapy was performed on a 65-year-old patient infected with COVID-19. He was given the first dose of umbilical cord stem cell, but to dismay of the doctors it did not show any visible effects. But the doctors had faith and gave the patient the second dose of the stem cells, and fortunately their idea worked and the patient's vital signs were steadied and organ failure was normalized. (Musial et al. 2021) And after giving the final or third dose, his lung was in a much better condition as compared to during the first dose of injection and fortunately he was shifted to the general wards of the hospital from the ICU.

Also, it is very important to widely promote in public if something is found to be favourable to the public health with genuine evidence. It is best if it is cost efficient, transport efficient and moreover is easily accessible to the public with proper prescription by the professional doctor.

## CONCLUSION

(Arora et al. 2020) To conclude, for clinical use in COVID-19, umbilical cord-derived stem cells deserve special attention from the doctors and researchers. It requires a more in-depth study to be able to use it for the treatment against the virus publically. The stem cells, because

they have plasticity, fortunately they do not show any carcinogenic side-effects. (Musial et al. 2021 and Acharya et al. 2020) The most used of stem cell to fight against the dangerous covid -19 infection is by intravenous infusions. To the pros the intra venous infusion is way more convenient than the intra-arterial infusion because it is more tactless as compared to intra-arterial infusion. But it also has a downside that it can show pneumonia as a complication.

## REFERENCES

- Acharya, S., Shukla, S. and Acharya, N., 2020. Gospels of a pandemic-A metaphysical commentary on the current COVID-19 crisis.
- Arora, D., Sharma, M., Acharya, S., Shukla, S. and Acharya, N., 2020. India in "Flattening the Curve" of COVID-19 Pandemic-Triumphs and Challenges Thereof. *Journal of Evolution of Medical and Dental Sciences*, 9(43), pp.3252-3256.
- Bian, X.W., 2020. Autopsy of COVID-19 patients in China. *National Science Review*, 7(9), pp.1414-1418.
- Burhani, T.S. and Naqvi, W.M., 2020. Telehealth--A Boon in the Time of COVID 19 Outbreak. *Journal of Evolution of Medical and Dental Sciences*, 9(29), pp.2081-2085.
- Butola, L.K., Ambad, R., Kute, P.K., Jha, R.K., Shinde, A.D. and DMIMS, W., 2020. The Pandemic of 21st Century-COVID-19. *Journal of Evolution of Medical and Dental Sciences*, 9(39), pp.2913-2919.
- Bawiskar, N., Andhale, A., Hulkoti, V., Acharya, S. and Shukla, S., 2020. Haematological Manifestations of Covid-19 and Emerging Immunohaematological Therapeutic Strategies. *Journal of Evolution of Medical and Dental Sciences*, 9(46), pp.3489-3495.
- Desai, D. and Shende, P., 2020. Nanoconjugates-Based Stem Cell Therapy for the Management of COVID-19. *Stem Cell Reviews and Reports*, pp.1-10.
- Latchoumi, T.P., Ezhilarasi, T.P. and Balamurugan, K., 2019. Bio-inspired weighed quantum particle swarm optimization and smooth support vector machine ensembles for identification of abnormalities in medical data. *SN Applied Sciences*, 1(10), pp.1-10.
- Marahatta, S. and Marahatta, S.B., 2020. Challenges of COVID-19 pandemic: Dermatologist's perspective from Nepal. *International Journal of Dermatology*, 59(12), p.1537.
- Musial, C. and Gorska-Ponikowska, M., 2021. Medical progress: Stem cells as a new therapeutic strategy for COVID-19. *Stem Cell Research*, p.102239.
- Musial, C. and Gorska-Ponikowska, M., 2021. Medical progress: Stem cells as a new therapeutic strategy for COVID-19. *Stem Cell Research*, p.102239.
- Sgalla, G., Iovene, B., Calvello, M., Ori, M., Varone, F. and Richeldi, L., 2018. Idiopathic pulmonary fibrosis: pathogenesis and management. *Respiratory research*, 19(1), pp.1-18.