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Welcome to Eurasian Journal of Comprehensive Clinical Medicine and Translational Research!!!

Thymosine -a T cell modulator in COVID-19

Anurag Anghole

*Department of Clinical Biochemistry, Vardhman Mahavir Medical College (VMMC) &
Safdarjung Hospital, New Delhi. India*

Amol Anbhule

*Department of Clinical Biochemistry, Vardhman Mahavir Medical College (VMMC) &
Safdarjung Hospital, New Delhi. India*

Prashant Tripathi

*Department of Clinical Biochemistry, Vardhman Mahavir Medical College (VMMC) &
Safdarjung Hospital, New Delhi. India*

Md. Muntakhab

*Department of Clinical Biochemistry, Vardhman Mahavir Medical College (VMMC) &
Safdarjung Hospital, New Delhi. India*

Omkar K. Choudhari (Corresponding Author)

omkarchoudhari@yahoo.com

*Department of Clinical Biochemistry, Vardhman Mahavir Medical College (VMMC) &
Safdarjung Hospital, New Delhi. India*

Institute of Origin: Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi

The ongoing pandemic of Corona Virus Disease(COVID-19) have resulted in millions of death worldwide and many big cities worldwide were under lockdown to contain the infection. Its been more than 2 year since the 1st case was reported in the Wuhan Province of Republic of China.[1] Presently various vaccines have got necessary approvals and vaccine rolling is ongoing amid rise of cases due to 3rd wave of pandemic.[2] Though effectiveness of vaccines varies, reports are suggesting that even after 2 doses of vaccine, a person may get infected with the Virus , however, the severity of clinical manifestation would be low if reinfection occurs.[3] Many drugs are now used in the treatment of COVID-19 including antibiotics like azithromycin, Doxycycline, anti- viral such as Remdesivir along with corticosteroids.[4,5] These drugs are redirected from their original use and being used in COVID-19 moderate and severe disease.

Current evidence however, suggests using the above mentioned antibiotics and antivirals are of limited use. The drug Remdesivir, being used is mainly meant for the treatment of RNA virus infections and its efficacy in earlier pandemic of SARS and MERS caused by the same corona virus, did not show any promising results.[6] Moreover, its uses are beneficial only in case of early presentation, where the drug is assumed to be inhibit the replication of virus and incorporation into cell and use its machinery.

Another cause would be inability of T cell to act, due to invasion of the machinery of cells and acting as self-antigens on the cells which lead to T cells inability to detect a foreign antigen and like happening in cancerous cells in the organisms.[7,8] After escaping the immune surveillance, tumour cells grow and metastasize , likewise virus particles escape immune system. We must however note that after establishing the tumour metastasis, case reports of spontaneous resolution are reported in many cancers including renal cell carcinoma, Hodgkin's lymphoma, multiple myeloma etc.[7] Their spontaneous resolution is attributed to T cell activation and their regaining ability to recognize those tumour cells as foreign and subsequent destruction and killing of these cells.

Thymosine is a hormone derived from the Thymus gland, which undergoes size reduction and only presents rudimentary levels in adults. The development of T cells and B cells, which is undertaken in hematopoietic cells and further maturation requires the thymus and bone marrow respectively for attaining their maturity to be able to combat infections. With age, its concentration diminishes in the blood. It is involved in amplifying the T cell maturation and brings specificity and versatility to the T cell nature.[9] So use of this agent could potentiate the T cell response and naturally resist infection. Moreover, it will increase the lymphocyte count and add to the immunological strength as lymphopenia is a common finding in COVID-19 and is associated with severe infection.[10]

Presently used drugs in the treatment of COVID-19 are either non-specific nor are they involved in the treatment of the basic problem with COVID-19. Most of these drugs used are mainly immune boosters, immune modulators with remdesivir as inhibiting the replication of the virus and hence help in stopping the establishment of infection.[11] But the natural immunity, which may have inhibited the virus particle, is never addressed. Use of Vitamin C may help in free radical scavenging, an antioxidant; however, no studies to the best of our knowledge showed that the Vitamin C supplement increases immunity or boosts immunoglobulin production. The same is with Zinc supplement, which plays a significant role in immunity; however, no specific studies showed a direct link of zinc supplement and its direct effect on viral replication or antibody production or any action on interferons and NK cells, which are primarily involved in the killing of viruses.[12] Along with it are the antibiotics, which are presently used in COVID-19 patients mainly to avoid secondary bacterial infections due to viral infections.

As many COVID-19 patients have mild disease or no symptoms and few other patients are having moderate and severe disease. If we consider familiar lineage wise, in a family one person may have severe disease while others are asymptomatic but are COVID RT-PCR positive. The point of variable expression in a family is probably attributed to T cell function. Many T cell polymorphisms are known and may be the contributory factor in the differential expression of the T cell.[13] So, potentiation of T cells via Thymosine may contribute to the development of a sufficient immune response to the invading pathogen and their deletion, like what happens in the spontaneous resolution of cancers. [7,14]

The safety concern for the use of Thymosine may arise; however, these hormones do not cause any significant side effects. The serum Thymosine level corresponds to the size of the Thymus and a high level of Thymosine causes negative feedback inhibition on the Thymus gland, reducing its size further. So, it can be safely used as the immune-modulator fighting the COVID-19 infection in a natural way.

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