

Melatonin as an Adjuvant in COVID-19 Vaccination

Jan Tesarik, MD, PhD^{1*} and Russel J Reiter, PhD²

¹MARGen Clinic, Camino de Ronda, Granada, Spain

²Department of Cell Systems and Anatomy, UT Health San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78229, USA

*Corresponding author: Jan Tesarik, MD, PhD, MARGen Clinic, Camino de Ronda 2, 18006 Granada, Spain, Tel: +34-606376992, E-mail: jtesarik@clinicamargen.com

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The development of COVID-19 vaccines represents a new hope to stabilize and reduce the progression of the pandemic. However, their use may not be free of serious side-effects, especially allergic reactions including anaphylaxis. This complication was observed after the first dose of both Moderna [1] and Pfizer-BioNTech [2] COVID-19 vaccines. Despite the relatively low incidence of these complications, they have to be taken seriously into account.

In addition, an unexpected rise in reported COVID-19 cases due to the emergence of new SARS-CoV-2 variants, observed since December 2020, raises an issue of whether the existing COVID-19 vaccines will be able to protect against new SARS-CoV-2 variants, both those already existing [3] and those which may appear in the future.

Melatonin, an endogenously-produced molecule, inhibits different forms of allergic reactions, including atopic dermatitis, atopic rhinitis and asthma, and prevents the vicious circle of pro-inflammatory cytokine activation, known as the “cytokine storm” [4]. These protective actions are due to a unique combination of immunomodulatory, anti-oxidative, and anti-inflammatory activities of this multifaceted molecule [4].

Adhering to the “First do no harm” principle, it has to be stressed that melatonin treatment has a large safety margin without serious adverse effects [4]. If administered together with a COVID-19 vaccine, it would be likely to reduce the unpredictable risk of serious allergic reactions, without any risk of additional health damage. Moreover, according to a recent analysis, melatonin is likely to act directly against the virus SARS-CoV-2 itself, by attenuating growth factor receptor signalling required for the virus replication in the infected cells [5]. These four antiviral actions of melatonin are not strictly strain-specific, and melatonin can act against a large range of viruses causing respiratory tract infections [4]. Accordingly, melatonin is highly likely to be effective against different variants resulting from SARS-CoV-2

mutations, both those already existing and those potentially appearing in the future.

Taken together, melatonin may not only protect individuals receiving COVID-19 vaccines against allergic reactions, but is also likely to potentiate the vaccines’ antiviral action. This is important because none of the existing vaccines has 100% efficacy. Moreover, in the event of possible future mutations of SARS-CoV-2, which may render the resulting variants less sensitive to the existing vaccines, melatonin can be used to cover the time period between the appearance of a vaccine-resistant virus variant and the development of a new vaccine adapted to this new condition.

Declaration of Interests

No potential conflict of interest relevant to this letter was reported.

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