



LETTER TO THE EDITOR

Cardiac glycosides and COVID-19: would it be a promising therapeutic approach?

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Abstract: Cardiac glycosides have been found to have an anti-viral effect. This was noted in the past during various epidemics including MERS and SARS. It is due to their inhibitory effect on the Na, K-ATPase membrane pump. Furthermore, they exhibit anti-inflammatory properties. These preclinical observations may prove useful in further clinical utility of these well-known compounds in the current COVID-19 pandemic.

Key words: antiviral effect, cardiac glycosides, COVID-19.

In their recent article Trindade et al. (2020) propose some therapeutic approaches to COVID-19 pandemic, related to the SARS-CoV-2 coronavirus.

Cardiac glycosides (CGS) digoxin and digitoxin merit a privileged position among the antiviral compounds. CGS inhibit the Na, K-ATPase membrane pump, a potent signal transduction pathway and ion-exchanger (Riganti et al. 2011). RNA viruses use the Na, K-ATPase pump, in order to attach to the host cell membrane and proceed in endocytosis and replication (Amarelle & Lecuona 2018). CGS were found in the course of previous viral epidemics including MERS and SARS, to inhibit the signaling properties of the pump, and provoke a host intracellular depletion of potassium (Burkard et al. 2015, Grosso et al. 2017). By these mechanisms, CGS inhibited viral transmembrane internalization and viral RNA and pre-RNA splicing necessary for the synthesis of viral proteins, interrupting the replication process (Amarelle et al. 2019). Furthermore, CGS possess significant anti-inflammatory properties, in vitro and in vivo, when administered in the course of inflammatory diseases. CGS downregulate various cytokines and activators, such as TNF α , TGF β and NF-KB ((Yang et al. 2005, Prassas & Diamandis 2008).

Given that COVID-19 is characterized by catastrophic proinflammatory cytokine storm in the target organs, an anti-inflammatory action of CGS provokes further investigation. CGS constitute a historical and emblematic treatment in heart failure and supraventricular arrhythmias. Should preclinical observations regarding the antiviral properties of CGS be translated to clinical validation, a new and promising COVID-19 therapeutic approach would emerge.

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