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A Short Note on Exercise and ACE2

Harika Vasupalli*

Gitam Medical College, Visakhapatnam, India

Short Communication

Obesity has been shown to extend the danger for more severe coronavirus disease 2019 (COVID-19) courses and better mortality, particularly among younger (age<50 years) hospitalized patients ((1)). Additionally to obesity, conditions that are typically related to lower physical activity (higher age, hypertension, diabetes, coronary heart condition, and chronic obstructive pulmonary disease) are related to worse clinical outcomes from COVID-19 ((2)). Regular workout promotes immune defense and reduces susceptibility to pathogenic microorganisms, including viruses. Under the time pressure of the present COVID-19 pandemic, rapid scientific discoveries alongside clinical observations have provided several potential drug targets. However, so far, neither vaccines nor effective and safe pharmacotherapies against the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exist. Therefore, nonpharmacological strategies, particularly moderate exercise, should be considered as approaches to scale back the SARS-CoV-2 infection–related burden. Whether workout affects propagation of SARS-CoV-2 or the course of COVID-19 is currently unknown.

The COVID-19 pandemic is currently exacerbating another established global pandemic – physical inactivity [1]. the planet Health Organization attributes approximately 3.2 million deaths per annum to sedentary behavior. For many, social distancing and quarantine including the systemic closure of fitness centers and public parks have imposed unique structural barriers to maintaining a physically active lifestyle. From a public health perspective, the importance of not conflating shelter-in-place with staying-in-place must be reinforced. Herein, exercise is going to be discussed as a possible therapeutic strategy to bolster resilience against COVID-19 via effects on ACE2.

Many physiological responses of the Renin Angiotensin System (RAS) are related to two opposite pathways: (1) a classical one formed by angiotensin-converting enzyme (ACE), angiotensin II (Ang II) and Angiotensin type 1 (AT1) receptor, which is associated to vasoconstriction, cell proliferation, organ hypertrophy, sodium retention and aldosterone release and (2) a counter-regulatory or vasodilator pathway comprising angiotensin-converting enzyme 2 (ACE2), Angiotensin-(1-7) [Ang-(1-7)] and Mas receptor, which is involved in vasodilation, antiproliferation, anti-hypertrophy, cardioprotective and renoprotective actions.

***Corresponding author:** Harika Vasupalli, Gitam Medical College, Visakhapatnam, India; E-mail: Harika.vasupalli@yahoomail.com

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