

Covid-19 Pandemic Era

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Abstract

In December 2019, an outbreak of Novel beta coronavirus, named Novel CORONAVIRUS (SARS-COV-2) in Wuhan city, Hubei province, China. The worldwide epidemic affecting all ages and more than six million infections.

The Coronavirus (Covid-19) manifestations consist of fever, cough, dyspnea, myalgia, headache and diarrhea, transmission through respiratory droplets when an infected person coughs or sneezes.

The elderly are at greater risk for complications of the epidemic virus, together with people with chronic diseases and those with a compromised immune system as in the case of cancer or HIV.

It is recommended for the elderly, Regular physical activity for staying healthy, with moderate-intensity exercise and balanced food intake with supplements to reduce feelings of stress and boost mental and physical performance and general health and muscle and bone healing and immunity.

Keywords: pandemic, physical activity, supplements, elderly, immune system.

Introduction

The purpose of this article was to revisit a fundamental question in the sport immunology field which is the impact of exercise on the immune system of elderly in the Covid-19 pandemic era, with special reference to Live points:

- How does the immune system respond to SARS -COVID-2?
- Can exercise affect immune function to increase susceptibility to infection?
- How exercise affects the physiological capacity of the elderly?
- What are the guidelines for exercising the elderly?
- What are the recommended supplements for the elderly?

Finally, a conclusion of all the above points.

CORONAVIRUS Disease 2019 (Covid-19) pandemic is caused by SARS-COV-2 (Severe Acute Respiratory Syndrome) CORONAVIRUS2, shortened to “coronavirus”.

This virus has a greater impact on human health and the economy throughout the world than any other health problem in the last century. It is predicted to be moved from horseshoe bats and pangolins by ingestion or eaten or used for Chinese medicine, sold in the seafood market in Wuhan. (23).

On January 30, 2020, the World Health Organization (WHO) declared that the new corona-virus outbreak in a public health emergency of international concern. The virus has already had a direct impact on millions of people in the city of Wuhan, China, on the 30.12.2019 as a cluster of pneumonia cases of unknown cause was reported on the PRO Med-mail website, this outbreak was linked to a seafood market in Wuhan, and in 8.1.2020 PRO Med-mail reported that the outbreak was linked to a novel CORONAVIRUS, the virus is spherical on pleomorphic, single-stranded, enveloped RNA and covered with club-shaped glycoprotein.

CORONAVIRUSES are four subtypes: alpha, beta, gamma, and Delta. CORONAVIRUS and affecting both man and animals. (5).

How does the immune system respond to SARS-CoV-2?

Conti et al (2020), La Gruta et al (2007) and Eichner (1993), Wang et al (2015) reported an answer to how the immune system responds to viral infection: As the coronavirus infects the upper and lower respiratory tract, this will lead to produced

(PAMPs) pathogen-associated molecular patterns, detected by Receptors on target cells. which induce cytokines production (interferons) which restrict virus action and cause inflammation. The secretion of cytokines by (NK) cells stimulates the adaptive immune system. It produces killer T cells, (CD8) to kill virus-infected cells through cytotoxicity. (5), (13).

Also, B lymphocytes produce specific antibodies against the virus to detect and fight the virus, Interferons may reduce viral control and increased neutrophils, monocytes, and macrophages directed to the viral invasion of the respiratory system, which in turn reduce the symptom of pneumonia and help the patients to reduce virus strength and help to recovery.

Chen et al. (2020) added that exercise at home is well suited to avoid coronavirus and maintain fitness levels. Home exercise may include strengthening exercises, activities for balance, stretching exercises, or a combination of the above exercises. (23). Wackerhage et al, (2020) reported that the exact mechanisms by which exercise may affect infections are unclear and moderate and vigorous exercise, that lasts less than 60 minutes stimulate NK cell, whilst mild exercise may boost, the immune system, but exhausting exercise may weaken the immune system and it is unclear whether exercise to exhaustion may weaken the immune system. (20).

Many types of research have demonstrated the deep impact that exercise can have on the immune system. There is a general thinking that regular exercise of moderate-intensity exercise is beneficial for immunity in old and young people and among those with chronic diseases. It is reported that lifelong physical activity is a potent means of reducing the risk of non-communicable diseases including cancer, cardiovascular disease, and other chronic inflammatory disorders. (22). Also, others reported that a physically active lifestyle diminishes the risk of communicable diseases including viral and bacterial infections. (17), (12), (14), (23).

An important question to be solved was asked by Simpson et al (2020), can exercise affect immune function to increase susceptibility to infection? It was reported by some Researchers that moderate exercise intensity may be beneficial for older adults and people with chronic diseases. In contrast, the infection burden is. Reported to be high

among performance athletes, meaning that exhaustive exercise can suppress immunity and increase infection risk. (19).

Regarding the effects of exercise on immune system responses indicated that following moderate intensity of exercise suited to the elderly indicated on increase in neutrophil and natural killer cell counts (NK). Also, salivary IGA concentration is enhanced together with increases stress hormones which lead to a reduction in excessive inflammation together may help to boost immunity against viral infections. Also, it is reported that twenty to thirty percent reduction of upper respiratory tract infections tract infection in performing a moderate level of exercise intensity while the high intensity of physical activity with long duration leads to immune suppression. (24).

How exercise affects the physiological capacity of the elderly?

When we approach the middle years, various organs and systems begin to deteriorate, which present itself as a number of diseases such as heart disease, arthritis, high blood pressure and low back pain, also a decrease in hormone production and diminish in elasticity of muscle with problem in balance, also skin problems and in blood vessels too.

The physiological process of aging will be reached and will take its toll. Exercise does not stop the biological clock, but it can slow it considerably as exercise based on scientific basis is imperative in maximizing physiological capacity. (3), (11).

Exercise prolong life:

Multiple studies have shown that regular exercise and judicious regimens of weight control have the benefit of prolonged life. The most evident reasons are that exercise especially regular one and weight control reduce cardiovascular disease due to lower blood pressure and cholesterol reduction and low-density lipoprotein, all these together reduce the number of heart attack and brain strokes. Also, a fit old person may have a respiratory system that exceeds oxygen delivery to the tissues as three to four-fold more than a nonfit person, this is of special importance when an older person develops conditions such as pneumonia that may be included by viral infections as Covid-19, pneumonia can especially require all available respiratory reserve, the same is also extended in case & cardiac reserve of a fit old person which is 50% greater than the nonfit old one. (8), (16).

Researchers are discovering that health-related problems can be improved by the intervention of exercise especially in old ages proper exercise lengthens and improves quality of life and living longer and more active lives. Athletically and nutritionally fit old people can measure out at 10 to 20 years biologically younger than their chronological age. (2), (4).

What are the guidelines for exercising elderly?

The strength exercise program should not begin with until the older participant reaches a good base level of strength.

Strength Exercise must begin with low to moderate intensity with higher amounts of repetitions.

Frequency two to three times per week, in conjunction with aerobic or cardiovascular exercises.

Duration: Approximately 60 minutes. (30 minutes of resistance, weight training and 30 minutes of aerobic or cardio exercises).

Intensity: approximately 50% to 80% of estimated V_{O_2} or 60% to 75% of maximum heart rate.

Flexibility Exercise: 2 to 3 times per week and after each session. Flexibility can be active stretching the muscle that are actively involved to do so in the eccentric contraction passive flexibility refers to the ROM available when an outside force (i.e. gravity, another person) in the causative force.

Points of consideration for elderly:

- A medical clearance is a must for older adults. They should have measures as blood panels, EKG's, and neurological assessments.
These assessments help to evaluate chronological versus fitness age.
- Regular exercise is important to maintain physical, emotional independence.
- Diseases could be prevented with appropriate lifestyle, good food and regular exercise.

Recommended supplements for elderly:

Elderly require specific supplements to boost their mental focus or arousal such:

- Phosphatidylserine (500 mg).

- Balanced meal to ensure blood sugar levels and for general health.
- Vitamins and mineral complex.
- Antioxidants (VIT.A, C, E glutathione selenium, green tea)
- Trace elements and minerals: Iron, Zinc, Copper, Calcium, Manganese.
- Immune boosters (colostrum, echinacea, DHEA).
- Amino Acids: glutamine, branched chain amino acid.
- Cardiovascular tonics (garlic, onion, ginger).
- Adaptogens (Siberian ginseng)

For rapid muscle and bone healing:

- Vit. C (1000mg).
- Insulin growth factors (colostrum).
- Vit. D3.
- Glucosamines.

Of the many dietary supplements most needed by the elderly are the branched-chain amino acids (BCAA) that contributes to the metabolism inside the muscle for generating muscle energy. BCAA is composed of Leucine, Isoleucine, and Valine. The contribution of BCAA as energy alternatives is about 15% or more of the total energy used in continuous physical training for a prolonged period. (18), also tryptophan may be very important for the elderly as it is transformed in the brain to serotonin hormone known to improve mood and help to reduce Fatigue. (15).

Water is recommended due to its Dietary importance for the elderly:

Drinking five glasses of water a day can lower the risk of the dead by heart disease as Reported By Dr.Jacqueline Chan Researcher of Loma Linda University, as it is a simple method for preventing Coronary heart disease, the importance of water is noted that dehydration could elevate risk factors as blood viscosity, a reduction of water means more concentrated blood. Also, temperature regulation in controlled lay water. Water lubricates joints and helps the digestive system and energy production. Water is also important for kidney, liver function.

The body needs to be well hydrated to function at peak condition. (ISSA integrated Nutrition Approach).

Conclusion

Preventing strategies may efficiently limit the rapidly expanding outbreaks of Cov-2019, especially speaking for the elderly. Present studies have shown that moderate-intensity physical activity has positive enhancing effects on immune system responses against viral respiratory infections. Moderate-intensity physical activity increases stress hormones, which lead to a reduction in excessive inflammation, also a 20 - 30 % reduction of upper respiratory tract infections. Also exercise in private environments (ex. at home), with good ventilation is suitable for the elderly to avoid CORONAVIRUS. Together with maintaining a safe distance with others and surfaces, avoid contact and separate pets if observed any infection activities like diarrhea, fever. avoid public places. Distance in Rescue.

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