

# Passion of Recreational Marathon Running: a Perspective in Contemplation to the Exercise Medicine with Respect to Health Implications

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## ABSTRACT

Physical exercise has been an effective tool for enhancing the health status thorough consolidation of anti-inflammatory, anti-oxidative strength and enhancements in immune function. But, uncontrolled inflammation and oxidation may seems inappropriate and may induce negative effects on health status. Recreational running has become a craze across the globe and many novice runners are participating in ultra-endurance marathon runs, exposing themselves for severe and uncontrolled levels of inflammatory and oxidative stress. Recreational runners need more scientific exposure to training and also they should incorporate appropriate rest and recovery methods like proper nutrition and scheduling of training based on scientific physical training principles.

**Keywords:** Physical Exercise; Anti-Inflammatory; Anti-Oxidative; Immune Function; Recreational Running

## Premise of the concept

Physical exercise has been recognised as a definite form of attaining functional fitness and health. The derivative benefits in terms of exercise are both physical and physiological. Exercise causes for the improvements in Physical aesthetics of the body making the person to appear excellent and enhancements in functional physiology of almost all the systems of the body leading to excellent health [16]. Exercise endocrinology research studies are indicating that physical exercise induces several positive changes in the endocrinal metabolism through the interplay of muscle myokines that are released from the muscle myotome while exercising [5,6]. Skeletal muscles release several dozens of chemical substances while under contraction stress, which are similar in function to cytokines released by other tissues of the body [2]. These cytokine-like substances released from the muscle and its related organs act in endocrine, autocrine and paracrine ways and conducts cross talk with the tissues of the different systems of the body that initiate for higher order metabolic function [3]. Apart from the skeletal muscle mechanism, exercise also can enhance the anti-inflammatory and anti-oxidative strength of the individuals through enhancing the counter endocrinal and metabolic environment to sustain the inflammatory and oxidative stress. Physical exercise seems to be a potential effector in enhancing the innate immune function by strengthening the lymphatic system, enhancing the thymus function and bone marrow functional physiology. But exercise immunology studies are indicating that different types or forms of exercises with their differences in their metabolic cascades involved differently, have potentially different effects in terms of inducing changes in inflammatory, oxidative and immune physiology. And also, different types of physical activities may induce differential effects on the organism in terms of inflammatory and oxidative stress, which may make the organism to respond differently. Basing on the substrate metabolism during the physical activity, the physical activities are generally recognised as aerobic exercises and anaerobic exercises, though in strict sense, there cannot be pure aerobic and pure anaerobic exercises but the aerobic and anaerobic metabolism runs in a continuum like manner. However, dominant metabolic pathways determine the type of exercise. Not only the different types of exercises produce different effects in terms of functional physiology that may include, inflammatory, oxidative, immune physiology, but different intensities and different durations of the same type of exercise may also induce differential effects in terms of these physiological functions leading to differences in functional enhancements in health status. Controlled and optimal inflammatory and oxidative stress through physical exercise may also induce enhanced immune strength that may be due to the result of higher anti-inflammatory and higher anti-oxidative strength [17]. Optimal levels of reactive oxygen species and other oxidants may in fact strengthen the mitochondrial functioning through the process mitochondrial hormesis [8]. Mitochondrial hormesis makes the organism to be more effective in tackling the superoxide, hydrogen peroxide and other reactive oxygen species effectively and channelling these reactive oxygen species to be as health promoting cytokine substances for enhanced health and longevity [4]. This may be understood in the same mechanism in which the low doses or optimal doses of infectious agents causing for enhancements in immune defence that may also help in achieving better health [11].

## Inflammatory and oxidative stress effects of recreational marathon running

Though there are several positive effects for physical exercise, it is important to be cautious while involving in physical activities. Those who are new to the physical exercise need to be very scientific in their approach for physical activities, and it needs to be highly protective in terms of rest and recovery methods [9,15]. Different physical activities due to their different metabolic cascades, may show different significant impacts on the tissues of the body. Due to the spread of wellness concepts in the society, a new trend has been appearing in the physical activity domain, which is recreational long distance running and cycling. Passion on recreational running seems a big craze among the urban elite both from men and women and the surge of participation in marathon runs across the globe is phenomenal. The passion is also across all the age groups without restriction only to the younger age group. Suddenly, people are realising about the health benefits of running and cycling and are indulging in long to very long distance running events without proper scientific preparation [14]. Most of these recreational runners participating in the ultra-endurance activities are novices and were not involved in physical activities earlier in life. Because of the sudden interest and motivation, these recreational runners may push their physical running efforts to such a high level which may surpass their tolerable physiological limitations in terms of inflammatory and oxidative stress mechanisms.

Sustained aerobic physical activities like long distance running, long distance cycling, especially the ultra-endurance efforts could induce severe oxidative and inflammatory stress on the several tissues of the body [12]. Mitochondrial oxidative stress due to high levels of beta oxidation could cause for release of oxidants which may cause for damage of cell membranes [10], proteins including DNA. Severe and sustained aerobic activities may also cause for high levels of inflammation that may promote pro inflammatory

cytokines presence in circulation. Several studies confirmed that both the controlled inflammatory and oxidative stress are essential for enhanced immunity and hormesis, especially the mitochondrial hormesis [1], anti-telomere truncation that may be anti-aging, which is very specific derivative from physical activity. Scientific studies indicate that, apart from the chronic effects of high inflammatory and oxidative stress and consequent immune suppression issues, the open window theory also suggests that there may be temporary suppression in mucosal immune proteins causing compromised immunity [7], especially the respiratory tract, leading to easy infections to the respiratory tract of the people who involve in high intensity sustained aerobic activities like ultra-endurance marathons and cycling events.

## Recommendations and Conclusions

Elite sportspersons and also general fitness enthusiasts need to be very scientific in managing their training as well the competition efforts. The recent trend of novice runners participating in marathon events for fitness and health needs more careful scientific training and recovery. Optimal adaptation may be essential for tolerance of high levels of oxidative and inflammatory stress during the high intensity sustained marathon events. Nutraceuticals may play significant role both in terms of providing anti-oxidative and immune strength, may also help in terms of achieving elite sports performances [13]. High intensity sustained aerobic activity training and participation require scientific monitoring to avoid possible risks of health and also negative effects on performances during competition.

## References

1. Bárcena C, Mayoral P, Quirós PM (2018) Mitohormesis, an Antiaging Paradigm. *Int Rev Cell Mol Biol* 340: 35-77.
2. Chen W, Wang L, You W, Shan T (2021) Myokines mediate the cross talk between skeletal muscle and other organs. *J Cell Physiol* 236: 2393-412.
3. Crane JD, MacNeil LG, Lally JS, Ford RJ, Bujak AL, et al. (2015) Exercise-stimulated interleukin-15 is controlled by AMPK and regulates skin metabolism and aging. *Aging Cell* 14: 625-34.
4. Garatachea N, Pareja-Galeano H, Sanchis-Gomar F, Santos-Lozano A, Fiuza-Luces C, et al. (2015) Exercise attenuates the major hallmarks of aging. *Rejuvenation Res* 18: 57-89.
5. Giudice J, Taylor JM (2017) Muscle as a paracrine and endocrine organ. *Curr Opin Pharmacol* 34: 49-55.
6. Gomarasca M, Banfi G, Lombardi G (2020) Myokines: The endocrine coupling of skeletal muscle and bone. *Adv Clin Chem* 94:155-218.
7. Kakanis MW, Peake J, Brenu EW, Simmonds M, Gray B, et al. (2010) The open window of susceptibility to infection after acute exercise in healthy young male elite athletes. *Exerc Immunol Rev* 16: 119-37.
8. Kim Y, Triolo M, Hood DA (2017) Impact of Aging and Exercise on Mitochondrial Quality Control in Skeletal Muscle. *Oxid Med Cell Longev* 2017: 3165396.
9. Kruk J, Aboul-Enein BH, Duchnik E (2021) Exercise-induced oxidative stress and melatonin supplementation: current evidence. *J Physiol Sci* 71: 27.
10. Merry TL, Ristow M (2016) Mitohormesis in exercise training. *Free Radic Biol Med* 98: 123-30.
11. Ristow M, Schmeisser K (2014) Mitohormesis: Promoting Health and Lifespan by Increased Levels of Reactive Oxygen Species [ROS]. *Dose Response* 12: 288-341.
12. Walsh NP, Gleeson M, Shephard RJ, Gleeson M, Woods JA, et al. (2011) Position statement. Part one: Immune function and exercise. *Exerc Immunol Rev* 17: 6-63.
13. Pingitore A, Lima GP, Mastorci F, Quinones A, Iervasi G, et al. (2015) Exercise and oxidative stress: potential effects of antioxidant dietary strategies in sports. *Nutrition* 31: 916-22.
14. Antonioni A, Fantini C, Dimauro I, Caporossi D (2019) Redox homeostasis in sport: do athletes really need antioxidant support? *Res Sports Med* 27: 147-65.
15. Elejalde E, Villarán MC, Alonso RM (2021) Grape polyphenols supplementation for exercise-induced oxidative stress. *J Int Soc Sports Nutr* 18: 3.
16. Koelwyn GJ, Zhuang X, Tammela T, Schietinger A, Jones LW (2020) Exercise and immunometabolic regulation in cancer. *Nat Metab* 2: 849-57.
17. Hojman P, Gehl J, Christensen JF, Pedersen BK (2018) Molecular Mechanisms Linking Exercise to Cancer Prevention and Treatment. *Cell Metab* 27: 10-21.