

Physiological Effects of Aroma Stimulation on Exercise Fatigue from Resistance Exercise

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Short Commentary

While resistance exercise is very helpful for growth of muscle cells and improvement in muscle strength, it is necessary to pay attention to the fatigue and side effects caused by muscle contraction type and exercise load. The occurrence of fatigue from resistance exercise refers to the state of difficulty or impossibility of continuing as efficiently with work based on muscle activity; here, muscle strength may decrease even though EMG (Electromyogram) or the stimulation rate remains constant.

A relevant study found that, in the case of resistance training, highstrength resistance exercise led to greater ventilation volume and blood lactate and gave a higher level of Excess Post-exercise Oxygen Consumption (EPOC) in the post-exercise recovery phase than lowstrength resistance exercise despite the equated work volume [1].

Resistance exercise that goes beyond the steady state that the body is able to bear in order to maximize the effects of exercise can be a major factor for muscle fatigue and cell or tissue damage. It can have negative effects on the immune system, including metabolic functions, the endocrine system, and the general body [2,3].

Aroma stimulation is a type of complementary therapy known to help improve the immune functions with prompt effects and, as a noninvasive means, without adverse effects by having the therapeutic ingredients of essential oils extracted from natural plants affect the brain directly [4]. Rosemary is effective in facilitating the circulation, in resolving body fluid stagnation, and in relieving gout, rheumatism, and muscle fatigue; peppermint is effective in relieving muscle pain, in recovering from fatigue and improving immunity because of specific affinity to blood and lymph, and in relieving pain and enhancing sedation [5-7]. Lavender is the most frequently used aroma essential oil and it facilitates the circulation within the body, which is effective in relieving muscle and nerve pain and in removing stress through relaxation of nerve tissues with harmony between the sympathetic and parasympathetic nervous systems [6,8].

Using a blend of 3-4 types of aroma essential oils rather than applying a single type of essential oil is a means of maximizing efficacy due to the properties of each type of oil [7].

The principal mechanism of aroma stimulation in the body is that particles of aroma essential oil absorbed through the nose with inhalation are delivered to olfactory nerve cells via cilia distributed on the nasal ceiling. Then receptors of the olfactory nerve cells contact the particles of aroma oil and provide a direct connection to the limbic system in the brain, providing physiological effects. The particles of aroma essential oil stimulate the pituitary gland, the thyroid gland, the parathyroid, and the adrenal reflex area, all of which respond to stress; regulate secretion of cortisol, which is a stress hormone within the body; and lead to emotional purification and relaxation of muscle tension [9].

Few studies have been conducted on the effects of aroma on fatigue from resistance exercise. However, a recent study on the effects of aroma stimulation on ratings of perceived exertion and blood fatigue from isotonic exercise in athletes with patellofemoral pain syndrome found that aroma stimulation using a mix of lavender, rosemary, and peppermint was effective in reducing the rating of perceived exertion and in inhibiting the occurrence of fatigue matters, such as LDH, in blood [10].

Applying high-intensity resistance exercise to maximize the effects of exercise may have negative effects on the whole body because of exercise fatigue. However, a proper blend of aroma stimulation can be effective for helping athletes inhibit efficiently the occurrence of exercise fatigue from resistance exercise. It is expected that further research will be conducted on using aroma stimulation to reduce exercise fatigue from resistance exercise and its relevant side effects on the body.

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Page 2 of 2

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