

ISEI Abstract – “Session theme number – 6”

Effect of laser irradiation on sIg A and mucosa structure of upper respiratory tract with six-week incremental exercise

XUANMING HAO, CHENGYI LIU, LIYING WANG, JIAN XU, AND FEI QIN

School of PE and Sport Science, South China Normal University, Guangzhou, 510006, China

ABSTRACT

[Objective] Mucosal immune suppression, with chronic intensive exercise, can be associated with an increased risk of upper respiratory tract infections, which should be related to the deterioration of the nasal mucosa structure. This study aimed to observe the change of nasal mucosa structure with 6-week incremental exercise, and to explore the effect of low level laser irradiation on nasal mucosa structure and mucosal immune function.

[Methods] 40 Sprague–Dawle rats, aged 8 weeks, were divided into 4 groups : Control, Exercise, Low power (4mw, 12.23 J/cm²) and High power laser (6mw, 18.34J/cm²) groups. Incremental treadmill exercise protocols: successive 6 weeks, 6 days/week, 30min /day. 10 m/min velocity during wk1, 20 m for wk2, with 5m/min/wk increment following weeks. The treatment of low level laser as following: He-Ne laser (0.19625 cm²), two irradiation point of nasal ala, 6-week duration, 6 days/wk, 2 times/day; 5min/time. Samples were taken pre and post 6-week exercise. Structure of mucosa of nose was observed by HE staining and sIgA tested by ELISA.

[Results] 1) following changes occurred in Exercise group after 6-wk exercise: nasal mucosa was seriously damaged and cilia layer of free edge fell essentially off. And mucous degeneration, necrosis and inflammatory cell infiltration were observed. 2) compared with exercise group, significant improvement was found with laser treatment. 3) sIgA with different groups saw as Table 1.

Table 1 sIgA changes after 6-wk exercise

groups	Control	Exercise	Low dose laser	High dose laser
sIgA(μg/ml)	52.92±6.69	50.20±4.76	70.77±4.24*	73.71±3.91*

* P<0.01 VS Control

[Conclusion] The long-term high-intensity exercise training would lead to destruction of nasal mucosa structure, and low energy laser irradiation had a beneficial effect on sIgA and nasal mucosa structure.