

A Gender-Based Study of the Effect of Exercise Stress on Cold Induced Pain and Its Related Cardiovascular and Respiratory Changes

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Abstract

Introduction: There are several reports regarding exercise induced analgesia and contradictory reports about gender difference. Aim of the study is to assess the effect of exercise on cold induced pain along with gender differences if any.

Methods: Normal adult male ($n=23$) and female ($n=18$) were selected for the study. The subjects were asked to immerse his/her dominant hand in ice cold water (20 to 40 °C) and pain threshold (start of feeling pain) and pain tolerance time (total time up to which pain can be tolerated) were recorded. For exercise, bicycle ergometer was used. Initial load for exercise was 25 watts, which increases with 25 watts at 2 minutes intervals and exercise was continued until the heart rate reached the 60 to 75 % of the maximal heart rate.

Results: The result showed that there were significant increase in female in systolic blood pressure (169 ± 13 mmHg Vs male 151 ± 20 mmHg), Diastolic Blood Pressure (Female 91 ± 13 versus male 83 ± 13 mmHg), Heart rate (female 153 ± 9.4 Vs male 135 ± 14 beat per minute), and Respiratory Rate (female 39.5 ± 3.3 per minute Vs 33 ± 3.3 per minute) than male in response to exercise. There was significant increase in all pain parameters just after exercise (Pain threshold from 14.25 ± 10.2 sec to 20.83 ± 13 sec after exercise, $p < 0.001$; pain tolerance from 39.5 ± 25 sec to 54.67 ± 31 sec, $p < 0.001$). Exercise had much effect on pain tolerance than pain threshold therefore pain duration also increased more after exercise (from 26.2 ± 20 sec to 36.2 ± 23.5 sec, $p < 0.01$). Although analgesic effect of exercise was observed in both the sexes but it was more pronounced in females in comparison to males.

Conclusions: The effect of exercise on pain perception was significant in both male and female, the analgesic effect being more enhanced in female than male.

Keywords: Gender, exercise stress, respiratory and cardiovascular changes.