ABSTRACT

Purpose: To investigate the relationship between the rating of perceived exertion (RPE) and blood lactate accumulation (BLA) in cancer patients during incremental treadmill exercise to volitional exhaustion. Methods: 76 cancer survivors were recruited from the University of Northern Colorado Cancer Rehabilitation Institute (UNCRCRI). All participants completed an initial assessment which included performance of the UNCCRI treadmill protocol, a graded treadmill protocol to volitional exhaustion. BLA was quantified at rest and following termination of the graded exercise test. RPE was assessed using Modified Borg scale at rest and upon termination of exercise. T-tests were used to compare resting and termination values for BLA and RPE. A Pearson’s correlation was used to assess the relationship between the change in BLA and the change in RPE from rest to termination of exercise. Results: Significant increases from rest to termination of exercise occurred for BLA (Resting: 1.79 ± 0.96 mmol/L, Termination: 5.99 ± 2.55 mmol/L; p<0.001) and RPE (Resting: 1.89 ± 0.95, Termination: 5.99 ± 2.55 mmol/L; p<0.001). A significant positive correlation was observed for the change in BLA and RPE (r = 0.39; p = 0.001). Conclusion: The current study shows a positive correlation of BLA and RPE during an acute bout of exercise to volitional fatigue in cancer patients, regardless of cancer-specific factors, such as treatment and fatigue. Therefore, it appears as though the exercise response in the cancer population is similar to the generally healthy population in both physiological response and subjective perception of exertion during progressive exercise testing.

METHODS

Cancer survivors (n = 76) were recruited for participation in exercise-based rehabilitation upon referral from an oncologist or primary care physician. Upon entry, all participants underwent an initial assessment of physiological variables, which included the UNCCRI Treadmill Protocol. Lactate accumulation and rating of perceived exertion was assessed during an acute bout of cardiovascular endurance, via the UNCCRI Treadmill Protocol. Lactate accumulation was assessed prior to and upon completion of the bout of exercise. Rating of perceived exertion, using the Modified Borg scale, was quantified at the beginning and upon completion of the exercise bout. T-tests were used to compare resting and termination values for blood lactate accumulation and rating of perceived exertion. A Pearson’s correlation was used to assess the relationship between the change in blood lactate accumulation and the change in rating of perceived exertion from rest to termination of the protocol.

RESULTS

All 76 patients completed the UNCCRI treadmill protocol. There was a significant and positive correlation for the change in BLA and RPE (Figure 1. r = 0.39; p = 0.001). A significant increase from rest to termination of exercise for BLA (Figure 2. Resting: 1.79 ± 0.96 mmol/L; Termination: 5.99 ± 2.55 mmol/L; p<0.001) and RPE (Figure 3. Resting: 1.89 ± 0.85, Termination: 5.99 ± 2.55 mmol/L; p<0.001) was determined.

CONCLUSION

• Blood lactate accumulation in cancer survivors, after an acute bout of exercise, is similar to the general population.

• Rating of perceived exertion in cancer survivors after an acute bout of exercise is similar to the general population. However, these individuals reach termination earlier in the bout, compared to a general population.

• RPE and BLA show a positive correlation. Regardless of cancer-specific factors, such as treatment and fatigue.

• The exercise response in cancer populations is similar to a healthy population in both physiological response and subjective perception of exertion during progressive exercise testing.

REFERENCES

