

Short Communication

No Effect of Long Distance Cycling on Physical Fitness of Medical Students Routinely cycling to College

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Abstract

Literature reports controversial findings about the effect of active commuting to and from school on the physical fitness. In the present study, we evaluated the effect of 6 months of cycling on the physical fitness and body composition in cycle commuting medical students. Twenty students of a premier medical college regularly cycling were randomly selected and divided into test and control groups. We compared the effect of 20 km long cycling 4 times /week apart from the normal routine with controls. We found that after 6 months of cycling there was no significant effect on the post-exercise heart rate after step test in the test group (132.8 ± 17.2 vs 139.2 ± 16.2 , $p > 0.05$) as well as control (143.2 ± 11 vs 149.6 ± 12.4 , $p > 0.05$) and VO_2 max values also did not change significantly (Test 55.6 ± 7.2 vs 52.9 ± 7.1 , $p > 0.05$ Control 51.2 ± 4.6 vs 48.5 ± 5.2 , $p > 0.05$). So we concluded, 6 months of long distance cycling in already cycle commuters does not improve the physical fitness.

Introduction

Physical fitness of an individual forms an important aspect of one's health. It is a powerful marker of health in young people which includes mainly cardiorespiratory fitness, muscular fitness, and motor fitness (1). Active commuting is defined as the phenomenon of using an active means of transportation in the form of either walking or bicycling, to and from school. Cycling is one of the

commonly and easily available modality to the people. Being a category of sedentary people, medical students have the inherent tendency to gain weight and buy diseases in the bargain. Cycling as an intervention could be used to assess the change in physical performance. It is still controversial about the contribution of active commuting to physical fitness (2, 3) but some observational studies have shown that young people who actively commute to school tend to be more physically active (4, 5).

The study was done in a medical college where students used to go cycling to attend the lectures routinely. Apart from this, college had an active cycling club where students were going for cycling 20 km about 4 times a week. So in the present study we evaluated the effect of 6 months of active

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long distance cycling on the physical fitness and body composition of the medical students.

Materials and Methods

Twenty age, weight and height matched medical students of 18-21 years were included in the study. Student volunteers and those free from diseases were included in the study. While the exclusion criteria involved students suffering from major diseases which could interfere with the study. Detailed clinical examination of the subjects was done and ethical clearance got from the Institutional Review Board after obtaining the written informed consent. A prospective cohort study was carried out at the Department of sports medicine in a premier medical college by randomly sampling the subjects. Out of 20 students inducted, 10 underwent regular long distance cycling over a period of 6 months, were designated as the test group and other 10 were not given this exposure hence designated as control group.

Body composition analysis was done by BC-Analyzer machine, which is based on the principle of bioelectric impedance. The parameters measured included BMI, Fat%, Waist-Hip Ratio. We used a submaximal test Queens College step test to evaluate the cardio-respiratory fitness of the subjects. This test is performed on a wooden stool of the height of 16.25 inches (41.3 cm) for a duration of 3 min at the rate of 24 cycles per minute for male subjects and the rhythm is set by a metronome. After the completion of the exercise, immediately post-exercise recording of carotid pulse rate is done to get peak heart rate. Then estimated VO₂ max is calculated = $111.33 - 0.42 \times \text{peak heart rate (bpm)}$ (6).

Results

Data was analysed using Microsoft Office Excel, for within the group comparison paired 't' test was used. A significance value of $p < 0.05$ was chosen for significant change.

Effect of cycling on body composition: No significant effect was seen.

Effect of cycling on the physiological parameters

Table I shows that there was significant increase in the resting heart rate of the test group after 6 months of cycling. No significant effect was seen in other parameters.

TABLE I: Pre & post intervention comparison of physiological parameters.

	Control		Test	
	Pre	Post	Pre	Post
Resting HR	72.8±9.6	70.9±8.7	68.3±8.5	75.3±9.9*
Peak HR	143.2±11	149.6±12.4	132.8±17.2	139.2±16.9
VO ₂ max	51.2±4.6	48.5±5.2	55.6±7.2	52.9±7.1

Values are mean±SD, * means $p < 0.05$.

Discussion

The present study highlights that cycling for 6 months did not improve physical fitness of subjects who were already regularly cycling.

Active commuting is an inexpensive form of physical activity that can be integrated into individuals' routines, and if sufficient intensity is achieved, active commuting could lead to an increase in cardiovascular fitness (7). The present study did not find improvement in the physical fitness in the test group (Table I). We could find two studies from the literature which agree with the findings of our study. In one, authors did not find any significant association between active commuting to school and cardiorespiratory fitness (8). Other study done by Heelan K A et al also suggests that there is no association of active commuting and physical activity (9).

There are so many studies which do not agree with the findings of our study like controversial reports have been found about the contribution of active commuting to physical fitness (10, 11). Still other studies showed that active commuting by cycling is associated with a higher cardiorespiratory fitness level (12).

The reasons for the differing results in our study

from the previous ones may be due to the higher resting heart rate which we got in test group (sympathetic dominance) meaning that the training effect of 6 months of cycling was not sufficient to produce the full physiological effects to be visible in VO₂ max values. The other reasons could be that most of the previous studies have evaluated the effect of active commuting to and from the school whereas in our study we have analysed the effect of 6 months of long distance cycling on the cardiorespiratory fitness. Still other reasons for the differing results in our study could be different modalities of testing physical fitness like some used cycle ergometer protocol (2), some used 20-m shuttle run test (12) and also 1-mile run time (9) and accelerometers. In the present study we used a very simple and handy objective method to evaluate the physical fitness by step test.

Limitations of the study

1) Strict adherence to training schedule of long distance cycling could not be followed religiously due to some college engagements like examinations and other unavoidable programmes. 2) Sample size in the study was a small due to limited number of cyclists in the college team. 3) There was no strict control over eating habits.

Conclusion

Six months of long distance cycling in cycle commuters does not improve the physical fitness in already regular cycle commuters.

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