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Research Article

Effect of aerobic exercise on maximal oxygen consumption of obese male children

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Abstract

The purpose of the study was to find out the effectiveness of aerobic training on maximal oxygen consumption of children prone to obesity. To achieve the purpose twenty five schools boys were selected from the Fathima Higher Secondary School, Karuvadikuppam, Puducherry and their age range between 14 to 16 years. The physiological variables used in this study included the maximum oxygen consumption and percent body fat as criterion variables were assessed using Cooper's twelve minutes run/walk test, before and after the experimental treatment for six weeks. The data collected thereof in maximum oxygen consumption and percent body fat were statistically analysed using paired 't' ratio. The result of this study showed that significant improvement in maximal oxygen consumption. This study showed that six weeks of aerobic exercise significantly minimize the cardiovascular risk among obese school children.

Keywords : Obese, school children, aerobic capacity, oxygen consumption and percent body fat

Introduction

Obesity is recognized as a major global burden to health (Wearing *et al*., 2006). In India when the child reaches adolescence their level of physical activity declines. There is evidence (Wang *et al*., 2002) that children and adolescents of urban families are more overweight than rural, possibly because of decreased physical activities, sedentary lifestyle, altered eating patterns and increased fat content of the diet. Increase in sedentary activities, such as television viewing and computer games, is suspected to be responsible for the decline in physical activity levels. Obesity is associated with increased systemic blood pressure, decreased aerobic fitness, cardiopulmonary function, increased rate of Type 2 Diabetes Mellitus and cardiovascular diseases (Wisloff *et al*., 2007). In order to eradicate obesity it is therefore important to encourage sustainable physical activity habits in children, and further reinforcing these habits in children, which will help establish desirable healthy lifestyle patterns that continue into adulthood. The purpose of the study was to find out the effectiveness of aerobic training on maximal oxygen consumption and percent body fat of children prone to obesity.

Methods

Subjects

To achieve the purpose of the study, twenty five schools boys from the Fathima Higher Secondary School, Karuvadikuppam, Puducherry, in the age group of 14 to 16 years, with a body mass index (BMI) between 85th and 95th percentile based on the cut-off points of the CDC dataset for BMI were considered as overweight and selected as subjects for this study. The selected subjects

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Table – 1. Training schedule

Week	Duration	Running pace	Distance (M)
I Week	15 minutes	350 metres slow and 50 metres fast	2400
II Week	16 minutes	350 metres slow and 50 metres fast	2550
III Week	16 minutes	325 metres slow and 75 metres fast	2800
IV Week	17 minutes	325 metres slow and 75 metres fast	3000
V Week	17 minutes	150 metres slow and 50 metres fast	3400
VI Week	18 minutes	150 metres slow and 50 metres fast	3600

Table – 2. Computation of data on maximum oxygen consumption

Variables	Test	Mean	SD	DM	Std Error of DM	't' ratio
Maximum oxygen consumption (ml/kg/min)	Pre-test	23.928	2.04199	0.9032	0.04373	20.652*
	Post test	24.831	2.09928			

DM : explain

neither have the experience of organised fitness training nor participating in any other special coaching programme. A qualified physician examined the subjects medically and declared that they were fit to undergo the physical activity programme. The subjects were free to withdraw their consent to participate in the training programme, in case they felt any discomfort during the period of training. But there were no dropouts in the study.

Variable and test

The experimental variable used in the present study was aerobic training for six weeks. The criterion variables chosen for the present research were physiological variables. Maximal oxygen consumption was assessed by Coopers 12 minutes run and walk test.

Training Programme

During the training period, the selected subjects underwent an aerobic training programme for three days a week, for six weeks in addition to their regular school activities. The subjects underwent the training programme under strict supervision. Prior to every training session, the subjects underwent ten minutes of warming-up exercises, which included jogging, stretching and striding. The subjects involved in the training programme were questioned about their health throughout the training period, none of them reported any injuries, however muscle soreness was reported in the early weeks but it subsidized later. Attendance was taken regularly. The training load was increased progressively as mentioned in the training schedule table - 1.

Statistical analysis

The data collected from the subjects prior to and after experimentation on selected physiological parameters and body composition, that is, maximum oxygen consumption and percent body fat were statistically examined for significant alterations because of aerobic training, if any, by applying the dependant 't' test with the help of SPSS package. In determining the significance of 't' ratio the confidence interval was fixed at 0.05 level, which is considered appropriate enough for the study.

Results

The analysis of data on physiological variables between pre test and post test capabilities were statistically analysed using 't' ratio and presented in table - 2.

Table - 2 indicates that the pre test and post test means on maximum oxygen consumption were 23.928 and 24.831 respectively. The obtained 't' ratio of 20.652 on maximum oxygen consumption was greater than the required table value 2.064 for significance with df of 24 at 0.05 level of confidence. The result of the study showed that there was a significant improvement on maximum oxygen consumption.

Discussion

The results obtained from this study on effectiveness of aerobic training on selected physiological parameters and body composition among children prone to obesity, clearly shows that there was a significant improvement on maximum oxygen consumption as a result of the aerobic training programme for the period of six weeks. These results were also in line with the previous literature that found improvements in health related parameters of obese participants as a result of regular exercise participation (Steinbeck, 2001 and Karacabey, 2009). Moreover, similar results have been reported in adults (Dengel *et al*., 1998 and Wong *et al*., 2008). In general aerobic training tends to increase maximal oxygen consumption.

Conclusion

It is concluded that aerobic exercise for six weeks significantly minimized the cardiovascular risk of obese children.

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