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The Effect of Aerobic Training on Structure and Function of Heart in the Disabled With Spinal Cord Injury

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Abstract : Research was done on the structure and function of the heart in disabled athletes and non-athletes. The purpose of this study was to investigate the effects of a selected aerobic program on 48 disabled participants with spinal Cord Injury (SCI). The athletes were selected from those involved in athletics (field events) at provincial and national levels. Non-athletes were selected from the disabled of Kahrizak sanitarium. Four equal groups were formed, two experimental groups including athletes and non-athletes, plus two control groups of athletes and non-athletes. The experimental groups performed aerobic exercise for 8 weeks and 3 sessions per week. The Control groups did not perform any special exercise. Echo-cardiography and Spectral Doppler were applied to study the structure and function of heart of the test groups before and after the exercises. At the end of the exercise program, no significant statistical changes were observed ($P>0.05$).

Spectral Doppler

Key Words:

Spinal cord Injury, Selected training program, Interventricular septal systolic, Interventricular septal diastolic, Left ventricular End Diastolic Dimension, left ventricular End Systolic Dimension, Left ventricular End Diastolic Volume , Left

($P < /$)

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ventricular End Systolic volume, Ejection fraction,
stroke volume, Left ventricular mass.

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Fukuda

Spectral Doppler

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Post Hoc (Tukey)

(ANOVA)

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* *NC, NE, SC, SE*

<i>(NC)</i>	<i>(NE)</i>	<i>(SC)</i>	<i>(SE)</i>	
				(n)
/ ± /	/ ± /	± /	/ ± /	(Yr)
/ ± /	/ ± /	/ ± /	/ ± /	(cm)
/ ± /	/ ± /	/ ± /	/ ± /	(Kg)
%	%	/ ± /	/ ± /	(n)
±%	±%	/ ± /	/ ± /	(Yr)
%	%	/ ± /	/ ± /	(Yr)
%	%	/ ± /	/ ± /	(Yr)

: *SE* *

: *SC*

: *NE*

: *NC*

NC, NE,

SC, SE

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(NC)	(NE)	(SC)	(SE)	
				(n)
/ ± /	/ ± /	/ ± /	/ abc ± /	((mm)IVSD)
/ ± /	/ ± /	/ ± /	/ bc ± /	((mm) IVSS)
/ ± /	/ ± /	/ ± /	/ ± /	((mm) LVPWTd)
/ ± /	/ ± /	/ ± /	/ ± /	((mm) LVPWTs)
/ ± /	/ ± /	/ ± /	/ c ± /	((mm) LVEDD)
/ ± /	/ ± /	/ ± /	/ c ± /	((mm) LVEDS)
/ ± /	/ ± /	/ ± /	/ bc ± /	((ml) EDV)
/ ± /	/ ± /	/ ± /	/ c ± /	((ml) ESV)
/ ± /	/ ± /	/ ± /	/ abc ± /	(%EF)
/ ± /	/ ± /	/ ± /	/ abc ± /	((ml)SV)
/ ± /	/ ± /	/ ± /	/ abc ± /	((gr) LVM)

NC, NE,

SC, SE

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(NC)	(NE)	(SC)	(SE)	
				(n)
/ ± /	/ ± /	/ ± /	/ ± /	((mm)IVSD)
/ ± /	/ ± /	/ ± /	/ ± /	((mm) IVSS)
/ ± /	/ ± /	/ ± /	/ ± /	((mm) LVPWTd)
/ ± /	/ ± /	/ ± /	/ ± /	((mm)LVPWTs)
/ ± /	/ ± /	/ ± /	/ ± /	((mm) LVEDD)
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/ ± /	/ ± /	/ ± /	/ ± /	(%EF)
/ ± /	/ ± /	/ ± /	/ ± /	((ml)SV)
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1. Anholm J.D, (1982). "Effect of habitual exercise on LV Response to exercise". *J. O Appl. Phsiology*, 52 :PP:1642-1652.
2. Barnard R.J. Taw L, (1984). "Cardiac hypertrophy and function in master endurance runner and sprinter". *J. of Appl. Physiology*, 57:PP: 176-181.
3. Berland J, (1986). "Echographic evaluation of cardiac response in marathon runners and sedentary adults before and after training", *science and sports*, 1: PP: 245-254.
4. Brown S.P., Thompson W.R. (1987). "Standardization indices of cardiac hypertrophy in weight lifters", *J. of sports science*, 5:PP:147-153.
- ... Medicine " 5. Cohen and Segal, (1985). "LV Hypertrophy in athletes and science in sports and exercise, 17 :PP: 695-700.
6. Corbett JL, Frankell HL, Harris PJ, (1971). "Cardiovascular reflexes in tetraplegia". *Paraplegia*, 9: PP:113-9.
7. Czerwinski SM, Kurowski TT, McKee EE, Zak R, Hickson RC, (1991). "Myosin heavy chain turnover during cardiac mass changes by glucocorticoids". *J appl physiol. Jan*, 70 (1):PP:300-5.
8. Dart A.M. (1992). "Effect of 4 weeks endurance training on cardiac LV structure and function". *clinical and experimental pharmacology and physiology*, 9 :PP:777-783.
9. De Maria N.A. (1979). "Systematic correlation of cardiac chamber size and ventricular performance determined by echo" . *Am. J. of cardiology*, 43:PP: 1-9.
10. DeVivo MJ, Fine PR, Maetz HM, Stover SL, (1980). "Prevalence of spinal cord injury. a reestimation of employing life table techniques". *Arch Neurol* 37:PP:707-8.
11. Diabello , (1996). "LV function during exercise in athletes and sedentary men", *Medicine and science in sports and exercise*, 28 :PP:190-196.

12. Du H, (1987). "Echocardiographic assessment of LV function of well - trained endurance athletes at rest and during dynamic exercise". *J. of China sports science society*, 7 :PP:33-38.
13. Durstine, J et al. (1993). "Increases in HDL-cand HDL/LDL colessterol ratio during prolonged endurance exercise", *metabolism*, 32 :PP:993-97.
14. Fagard R, (1984). "Cardiac structure and function in cyclists and runners". *Br. Heart Journal*, 52 :PP:124-129.
15. Felici F, (1988). "ECG study of LV function in athletes participating in various sporting disciplines", *medicin, Dello, sport*, 41 :PP:13-20.
16. Figoni SF, (1993). "Exercise responses and quadriplegia". *Med Sci sports exercise* 25 (4): PP:433-41.
17. Fitzgerald Pl, sedlock DA, knowlton RG, (1990). "Circulatory and thermal adjustments to prolonged exercise in paraplegic women". *Med Sci sports exercise* 22 (5): PP:629-35.
18. Fleck SJ, (1988). "Cardiovascular adaptations to resistance training". *Medicine and science in sports and exercise*, 20 :PP:146-151.
19. Fleck SJ, (1989). "Cardiac MRI of elite junior olympic weight lifters, Inter". *J. of sports Medicine*, 19 :PP:329-333.
20. gates PE, Campbell IG, George KP, (2002). "Absence of training - specific cardiac adaptation in paraplegic athletes". *Med Sci Sports Exerc. Nov. 34 (11):PP: 1699-704.*
21. Geistre WO, jousse AT, wynne - jones M, (1977). "Survival in traumatic transverse myelitis". *Paraplegia* 14:PP:262-75.
22. Glaser RM. (1989). "Arm exercise training for wheelchair users". *Med Sci sports exerc* 21: S 149-S 57.
23. Hopman MTE, Verheijen PHE, Binkhorst RA,. (1993). "Volume changes in the legs of paraplegic subjects during arm exercise". *J. appl. phys.* 75 (5): PP:2079-83.
24. Hurley B, (1989). "Effects of resistive training on lipoprotein lipid profiles, a comparison to aerobic exercise training", *Med. sci. sports exercise*, 21:PP: 689-93.

25. Le CT, price m, (1982). "Survival from spinal cord injury". *J chron ids* 35: PP:487-92.
26. Martel G, Noreau L, Jobin J, (1991). "Physiological responses to maximal exercise on arm cranking and wheelchair ergometer with paraplegics". *Paraplegia*. 29: PP:447-56.
27. McLean KP, Jones PP, Skinner JS, (1995). "Exercise prescription for sitting and supine exercise in subjects with quadriplegia". *Med Sci sports exerc.* 27 (1): PP: 15-21.
28. Miles DS, Swaka MN, Wide SW, Durbin RJ, Gotshall RW, Glaser RM, (1982). "Pulmonary function changes in wheelchair athletes subsequent to exercise training". *Ergonomics* 25:PP: 239-46.
29. Morganroth J, (1975). "Comparative LV dimensions in trained athletes", *Ann . Int. medicine*, 82 :PP:521-528.
30. Nilsson S, Staff PH, Pruett EDR, (1975). "Physical work capacity and the effect of training on subjects with long - standing paraplegia". *Scand rehabil Med*, 7:PP: 51-6.
31. Obert P, Mandigout M, Vinet A, Courteix D, (2001). "Effect of a 13-week aerobic training programme on the maximal power developed during a force - velocity test in prepubertal boys and girls", *Int J sports Med Aug*, 22(6) :PP: 442-6.
32. Patiron, Bourdon, (1989). "Athletic Heart". *J. Science and sports*, 4 :PP:305-316.
33. Pelliccia, (1985). "Morphological evaluation of the athletes heart", *medicine dello sports*, 32 :PP:105-112.
34. Reubrouck T, Heigenhauser GF, Faulkner JA, (1975). "Limitations to maximum oxygen uptake in arm, leg and combined arm - leg ergometry". *J appl physiol* 38:PP: 774-9.
35. Sa 29. Nandler H, Vernikos J, (1986). "Inactivity: physiological effects". Orlando. FL. Academic Press Inc.
36. Serra - Grima JR. (1994). "Assessment of LV hypertrophy in athletes with echocardiography and antimony". *Arch. De Medicine*, 11 :PP:127-131.
37. Shapiro L.M, (1984). "Physiological LV hypertrophy", *Br. Heart J*, 52:9130-135.

38. Shephard RJ, Bouhrel E, Vandewalle H, Monod H, (1988). "Muscle mass as a factor limiting physical work", *J appl phys*, 64:PP: 1472-9.
39. Slak R.C. (1985). "LV size and function in body builders using anabolic steroids, *Med*". *And science in sports and exercise*, 17 :PP:701-704.
40. Thorstensson A, (1977). "Observations on strength training and detraining". *Acta physiol scand* 100:PP: 491-3.
41. Wicks JR, Lymburner K, Dinsdale SM, Jones NL, (1977). "The use of multistage exercise testing with wheelchair ergometry and arm cranking in subjects with spinal cord lesions". *Paraplegia* 78: 15:PP: 252-61.
42. Young JS, Burns PE, Bowen AM, McCutcheon R, (1982). "Spinal cord injury statistics. Experience of the regional spinal cord injury systems". Phoenix: Good samaritan medical center