

Thesis Title	Effects of Vitamin B ₁ Supplementation to the Cardiac Efficiency on Exercise
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ABSTRACT

The study of effects of vitamin B₁ supplementation to the cardiac efficiency on exercise was performed in 25 healthy volunteers both male and female. They were supplemented with thiamine hydrochloride 300 milligrams per day for 9 weeks. The vitamin B₁ status was evaluated by erythrocyte transketolase (ETK) and thiamine pyrophosphate effect (TPP-effect) before and after the supplementation. There were statistically significant increase in ETK and decrease in TPP-effect after the supplementation. The cardiac response to exercise was assessed by non-invasive technique by simultaneous external recordings of electrocardiogram, phonocardiogram, and external carotid pulse tracing before and immediately after exercise. The subjects were assigned to perform exercise with bicycle ergometer on sitting position for 6 minutes with workload of 51 and 76.5 watts for female and male respectively. The parameters before and after the exercise were calculated for the percent of difference. The values before and after supplementation of vitamin B₁ were compared to detect cardiac adaptation to exercise. Before vitamin B₁ supplementation, the results showed statistically significant decrease in pre-ejection period (PEP), isovolumic contraction time (IVCT), left ventricular ejection time (LVET),

corrected ejection time (CET), PEP/LVET, and PEP/CET but increase in heart rate (HR). These findings indicate that the heart increases cardiac output (CO) in response to exercise, and the major factor for this is an increase in HR. After vitamin B₁ supplementation, there were significantly more decreases in PEP, IVCT, PEP/LVET, and PEP/CET while there were less decrease in LVET and less increase in HR. The response of CET to exercise changed from a decrease to an increase. These findings indicate a more efficient heart as a pump. The cardiac output increases in parallel to stroke volume while the adrenergic stimulation for heart rate decreases. In conclusion, the vitamin B₁ supplemented heart has better contractility as that found in the well-trained subject. The body weight after 9 weeks of vitamin B₁ supplementation significantly increased.