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ANALAZING THE EFFECTS OF PLATELET ON THE DURABILITY TRAINING

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ABSTRACT

This study has been done to examine that; Are there any effects of the morning and evening durability training on the platelet or not. 38 students volunteered to participate in the study. Subjects were divided into morning, evening and control groups and Blood samples were taken at 07.00 in the morning and at 16.00 in the evening. In the evaluation of durability, "Conconi test" was applied as exercise protocol. After 6 weeks of exercise protocol, the blood samples were taken and the "conconi test" protocol was reapplied and the difference and the relation was examined. SPSS 21.0 package program was used to analyze the data. Pearson Correlation analysis was used to examine inter-variable relationships, and Anova was used to determine differences between groups. The results are presented as mean and standard deviation, with a $P < 0.05$ significance. It was seen that there was no significant difference between the comparison groups between morning, evening and control group as a result of our study. In the analysis of the relationship between the variables, the relationship between PLT and MPV, PLT 2, MPV 2 and PDW 2, PDW; Anaerobik Heart Rate b, Anaerobik Heart Rate a and Runing Speed b..

Key Words: Cell fragment, Thrombocyte, Endurance

INTRODUCTION

Platelet is the cell fragments that provide blood clotting and it is also known that Thrombocyte. There are many studies examining the effects of exercise on hematological parameters. In fact, blood parameters affect the type and intensity of exercise, the exercise affects blood parameters as well, and it is important for various blood pathologies (Çavuşoğlu, 1991) .

Depending on the type, severity and duration of the exercise, there may be changes in hematological and biochemical parameters. Hematologic and biochemical values during and after intense exercise can vary due to differences in the person's training status, gender, age, environmental conditions and nutrition. Hematological changes are observed in the athletes due to long-term exercises (Beydağı ve ark., 1992; Beydağı ve ark., 1993).

The mechanism of function changes that exercise generates is not clear. Different mechanisms as "Increases in catecholamines, D adrenergic receptor activation, on the amount of platelet, on the PGI2 / TxA2 balance, the NO and PGI2platelet sensitization" have been suggested as mechanisms underlying the response of thrombocytes to exercise (Brass, 2000; Meirelles, 2009; Siess, 1989).

Adaptation to training is the sum of the changes that result from a systematic recurrence of exercises.

These structural and physiological changes on the body are a consequence of the burdens required by a special activity carried out in accordance with the scope, intensity and frequency of the training.
Physical training is only useful as long as it forces the body to adapt to high-level loads.
If the overload is not enough to make a change in the body, there will not be any adaptation (Bompa, 2003). This study has been conducted to examine whether the morning and evening durability training have an effect on Platelet or not.

MATERIAL AND METHOD

38 students who studied at Denizli Pamukkale University Sports Science and Technology High School have voluntarily participated in the research. The subjects were divided into morning, evening and control groups and their blood tests were checked before the exercise started in the morning (07.00) and evening (16.00) and immediately after the end of the exercise. Bloodletting and blood tests were carried out at the central laboratory of Pamukkale University Medical Faculty Hospital. To determine the body fat percentages of subjects; The skinfold thickness from the biceps, triceps, supsapapula and suprailiak parts was measured with the Skinfold caliper (Holtain Ltd. UK) and the lengths were measured with the Holtain anthropometry set (Holtain Ltd. UK). Body fat measurements were calculated using the formula of Durnin and Womersley (Durnin 1974). The ConConi test was carried out to determine the durability performance. 15-20 minutes warming and stretching activities were carried out during the application of the test and during the exercise period (Renstrom, 2000). In this process, it is aimed to increase body heat, accelerate metabolic processes and optimize muscle-cardiovascular metabolism (Bishop, 2003). During the applicationof the test, this test, which was carried out circularly with the help of 5 signs located 20 m between each other, was started at a speed of 8.5 km / h. and an increase of 0,5 km/h was made every 200 m, in a one running speed . The test was continued until the athletes voluntarily terminated the test or until they missed two more signals at two successive 20 m. The signal sound was set using a laptop and a CD (Conconi, 1982, Conconi, 1996). During the Conconi test, watches that record the heart rate RS 800 (Polar Vantage NV, Polar Electro Oy, Finland)were given to sportsmen and the HR values of the athletes were recorded during the test. After the test, the results were transferred to a computer and the average CAD corresponding to each speed was determined. By going out of these speeds; They did extensive endurance training to improve the endurance performances of the athletes by 3x10 min 2 min rest and pulse 150, Intensive durability as 1x20 min pulse 165, 3x6-8 min. 3-5 min. Pulse with rest: 178 Widespread intervertebral extreme durability for 3 days a week for 6 weeks, and 1 day is intense endurance and extensive interval endurance training.The blood samples of the subjects taken before the study were analyzed and after 6 weeks the same tests were repeated at the end of the study. IBM SPSS (Statistical Package for the Social Sciences) 21.0 package program was used to analyze the data. Descriptive Statistics were used to determine the distributions of the

data. Pearson Correlation analysis was used to examine relationships between variables, and Anova (post-hoc / Tukey) was used to determine differences between groups. The results have been presented as mean (X) and standard deviation (SS), with a P <0.05 significance.

FINDINGS

Table: 1 The Comparison of Intergroup Variables

Variables	**1st group (morning)**		**2nd Group (evening)**		**3rd Group (Control)**		**F**	**P**
	X	**SS**	**X**	**SS**	**X**	**SS**		
Sex	1,3571[a]	,13289	1,3333[a]	,14213	1,1667[a]	,11237	,622	,543
Age	22,3571[a]	,40065	23,3333[a]	,85576	22,3333[a]	,75210	,699	,504
Height	168,4286[a]	2,27194	169,0000[a]	1,88696	169,5000[a]	2,26468	,063	,939
Weight	63,5429[a]	3,42906	58,3333[a]	2,60839	59,0167[a]	2,57452	,950	,397
Bme	22,1714[a]	,84395	20,3417[a]	,57964	20,4417[a]	,45418	2,441	,102
fat a	15,0500[a]	1,61350	15,4500[a]	1,76363	15,6833[a]	1,47617	,040	,961
Fat b	14,6571[a]	1,44772	13,8667[a]	1,28260	15,9333[a]	1,42432	,528	,594
Running speed a	11,6424[a]	,41413	11,0833[a]	,41210	11,5417[a]	,33404	,570	,571
AnaKah a	183,2857[a]	1,69495	186,9167[a]	1,64436	184,2500[a]	,76994	1,632	,210
Running speed b	11,8000[a]	,41178	11,2000[a]	,36845	11,0917[a]	,32133	1,081	,350
AnaKah b	181,5714[a]	1,70878	186,8333[a]	1,71373	184,5833[a]	,98825	3,034	,061
Topmes a	1807,1429[a]	236,84378	1666,6667[a]	211,53599	1850,0000[a]	151,50758	,204	,817
Topmes b	2098,5714[a]	242,61818	1805,8333[a]	202,61345	1791,6667[a]	128,78119	,760	,475
PLT	233,5714[a]	17,71779	261,7500[a]	12,22896	247,1667[a]	11,44607	,954	,395
PLT 2	268,4286[a]	14,08675	289,7500[a]	16,78840	271,0833[a]	9,69337	,686	,510
MPV	8,5479[a]	,33097	8,0308[a]	,20290	8,5500[a]	,34047	,948	,397
MPV 2	7,9200[a]	,20597	8,1208[a]	,23470	8,3792[a]	,25382	1,015	,373
PDW	12,9500[a]	,47483	11,8000[a]	,21497	12,9417[a]	,53788	2,212	,125
PDW 2	12,1179a	,25304	11,6417a	,16153	12,2500a	,25226	1,849	,173

[a,b,] The difference between groups with different letters in the same line is significant (p<0.05)

When the table was examined, It was found that the difference between the groups was not significant in all of the variables of Gender, Age, Height, Weight, Bme (Body Mass Index), Fat a, Fat b, Running Speed, AnaHR (Anaobicobic Heart Rate), Running Speed b, AnaKah b, Topmes a (Total Distance), Topmes b, PLT, PLT 2 , MPV, MPV 2, PDW, PDW 2. (P <0.05)

Table: 2 Examining the relationship between variables.

		PLT	PLT 2	MPV	MPV 2	PDW	PDW 2	Group	gender	Age	Height	Bme		Fat a	Fat b	Running speed a	AnaKah a	Koşu Hızı b		AnaKah b
PLT	C	1	,222	-,522**	-,032	-,290	-,216	,118	,045	-,064	-,168	-,100	-,021	-,089	-,109	-,252	,183	-,153	-,183	,316
	Sig.		,180	,001	,851	,077	,193	,480	,789	,701	,314	,549	,901	,595	,516	,126	,270	,360	,271	,054
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
PLT 2	C	,222	1	-,209	-,626**	,129	-,507**	,031	-,230	-,126	-,047	-,121	-,111	,248	,167	-,112	,146	-,002	-,113	,098
	Sig.	,180		,209	,000	,440	,001	,854	,165	,449	,780	,469	,508	,133	,317	,503	,381	,989	,501	,559
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
MPV	C	-,522**	-,209	1	,268	,253	,256	-,009	-,215	,090	-,110	-,090	-,034	,184	,242	,016	-,179	-,142	-,035	-,300
	Sig.	,001	,209		,104	,125	,120	,957	,195	,590	,510	,590	,839	,268	,144	,926	,283	,395	,833	,067
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
MPV 2	C	-,032	-,626**	,268	1	-,220	,591**	,234	,026	,386*	-,030	-,063	-,075	-,120	-,068	-,058	-,063	-,059	-,104	-,034

	Sig.	,851	,000	,104		,185	,000	,158	,875	,017	,856	,708	,652	,472	,685	,730	,708	,725	,535	,841
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
PDW	C	-,290	,129	,253	-,220	1	-,008	-,017	-,027	-,214	-,029	,005	,037	,022	,043	,342*	-,207	,243	,364*	-,357*
	Sig.	,077	,440	,125	,185		,964	,921	,875	,197	,862	,978	,828	,898	,799	,036	,212	,142	,025	,028
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
PDW 2	C	-,216	-,507**	,256	,591**	-,008	1	,053	-,007	,512**	-,126	-,068	-,016	-,160	-,104	,038	,004	,041	-,027	-,023
	Sig.	,193	,001	,120	,000	,964		,753	,966	,001	,453	,683	,924	,336	,536	,819	,981	,806	,873	,892
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Group	C	,118	,031	-,009	,234	-,017	,053	1	-,170	,004	,060	-,185	-,299	,047	,103	-,038	,088	,020	-,225	,232
	Sig.	,480	,854	,957	,158	,921	,753		,307	,980	,722	,266	,069	,778	,539	,820	,600	,904	,174	,161
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
gender	C	,045	-,230	-,215	,026	-,027	-,007	-,170	1	,044	,552**	,689**	,566**	-,495**	-,527**	,691**	,198	,631**	,727**	,194
	Sig.	,789	,165	,195	,875	,875	,966	,307		,795	,000	,000	,000	,002	,001	,000	,234	,000	,000	,244
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Age	C	-,064	-,126	,090	,386*	-,214	,512**	,004	,044	1	-,140	-,031	,053	-,030	-,061	-,209	,023	-,172	-,203	,129
	Sig.	,701	,449	,590	,017	,197	,001	,980	,795		,401	,852	,751	,859	,716	,208	,893	,303	,221	,440
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Height	C	-,168	-,047	-,110	-,030	-,029	-,126	,060	,552**	-,140	1	,777**	,362*	-,208	-,240	,470**	-,005	,383*	,402*	-,063
	Sig.	,314	,780	,510	,856	,862	,453	,722	,000	,401		,000	,026	,211	,146	,003	,976	,018	,012	,706
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38

Weight	C	-,100	-,121	-,090	-,063	,005	-,068	-,185	,689**	-,031	,777**	1	,864**	,015	,004	,445**	,004	,292	,422**	-,107
	Sig.	,549	,469	,590	,708	,978	,683	,266	,000	,852	,000		,000	,930	,981	,005	,981	,075	,008	,522
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Bme	C	-,021	-,111	-,034	-,075	,037	-,016	-,299	,566**	,053	,362*	,864**	1	,216	,224	,274	,013	,116	,289	-,112
	Sig.	,901	,508	,839	,652	,828	,924	,069	,000	,751	,026	,000		,193	,177	,096	,940	,487	,079	,505
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Fat a	C	-,089	,248	,184	-,120	,022	-,160	,047	-,495**	-,030	-,208	,015	,216	1	,974**	-,519**	-,148	-,585**	-,549**	-,292
	Sig.	,595	,133	,268	,472	,898	,336	,778	,002	,859	,211	,930	,193		,000	,001	,376	,000	,000	,076
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Fat b	C	-,109	,167	,242	-,068	,043	-,104	,103	-,527**	-,061	-,240	,004	,224	,974**	1	-,495**	-,183	-,582**	-,554**	-,322*
	Sig.	,516	,317	,144	,685	,799	,536	,539	,001	,716	,146	,981	,177	,000		,002	,270	,000	,000	,049
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Running speed a	C	-,252	-,112	,016	-,058	,342*	,038	-,038	,691**	-,209	,470**	,445**	,274	-,519**	-,495**	1	,069	,904**	,946**	,022
	Sig.	,126	,503	,926	,730	,036	,819	,820	,000	,208	,003	,005	,096	,001	,002		,679	,000	,000	,896
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Ana Kah a	C	,183	,146	-,179	-,063	-,207	,004	,088	,198	,023	-,005	,004	,013	-,148	-,183	,069	1	,179	,047	,881**
	Sig.	,270	,381	,283	,708	,212	,981	,600	,234	,893	,976	,981	,940	,376	,270	,679		,281	,781	,000
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Top mes a	C	-,153	-,002	-,142	-,059	,243	,041	,020	,631**	-,172	,383*	,292	,116	-,585**	-,582**	,904**	,179	1	,878**	,181

	Sig.	,360	,989	,395	,725	,142	,806	,904	,000	,303	,018	,075	,487	,000	,000	,000	,281		,000	,276
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Running speed b	C	-,183	-,113	-,035	-,104	,364*	-,027	-,225	,727**	-,203	,402*	,422**	,289	-,549**	-,554**	,946**	,047	,878**	1	,024
	Sig.	,271	,501	,833	,535	,025	,873	,174	,000	,221	,012	,008	,079	,000	,000	,000	,781	,000		,884
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Ana Kah b	C	,316	,098	-,300	-,034	-,357*	-,023	,232	,194	,129	-,063	-,107	-,112	-,292	-,322*	,022	,881**	,181	,024	1
	Sig.	,054	,559	,067	,841	,028	,892	,161	,244	,440	,706	,522	,505	,076	,049	,896	,000	,276	,884	
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Topmes b	C	-,184	,011	-,127	-,100	,242	,003	-,183	,646**	-,175	,356*	,305	,154	-,589**	-,603**	,881**	,155	,970**	,904**	,146
	Sig.	,269	,946	,449	,552	,144	,986	,273	,000	,294	,028	,062	,356	,000	,000	,000	,354	,000	,000	,383
	N	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

When the table is examined, The relationship of Gender variable is significant at 0.01 level with Height, Weight, Bme, Fat a, Fat b, Running Speed a, Running Speed b, Topmes a, Topmes b. The relationship between age variable and MPV 2 is significant at 0.05 level and between PDW2 there is significant relationship at 0,01 level. The height variables has significant relationship at 0,01 level with Gender, Wight, Running Speed a; and at 0,05 with Bme, Tompes a, Tompes b, Running Speed b. The relationship of Bme variables with Gender, Wieght, is significant at 0,01 level; with Height at 0,05 level. The relationship of Fat a variables with Gender, Fat b, Running speed a, Running Speed b, Topmes a, and Tompes b is significant at 0.01 level. The relationship of Fat b variables with Gender, Fat a, Running Speed a, Running Speed b, Topmes a, Topmes p is significant at 0.01 level; with AnaHr is significant at 0.05 level. The relationship of Running Speed a with Gender, Height, Weight, Fat a, Fat b, Topmes a, Topmes b is significant at 0.01 level; with PDW there is a significant relationship at 0.05 level. The relationship of Running Speed b variables is significant at 0.01 level with Gender, Weight, Fat a, Fat b, running speed a, topmes a and Topmes b; at 0.05 with PDW and Height. The relationship of AnaKah a variables is significant at 0.01 level with AnaKah b. The relationship of AnaKah b variables is significant at 0.01 level with AnaKah a; at 0.05 level with PDW, Fat b. The relationship of Topmes a variables is significant at 0.01 level with Gender, Fat a, Fat b, Running Speed a, Running Speed b, Topmes b; at 0.05 level with Height. The relationship of Topmes b variables is significant at 0.01 level with Gender, Fat a, Fatb, Running Speed a, Running Speed b, Topmes a; at 0.05 with Height. The relationship of PLT variables is significant at 0.01 level with MPV. The

relationship between PLT 2 variable and MPV 2, PDW 2 is significant at 0.01 level. The relationship between MPV and PLT is significant at 0.01 level. The relationship of MPV 2 variables is significant at 0.01 level with PLT 2 and PDW 2; at 0.05 level with Age. The relationship of PDW variables ia significant at 0.05 level with Anekah b, Running Speed a, Running Speed b. The relationship between PDW 2 variables and PLT 2, MPV 2, Age is significant at 0.01 level.

DISCUSSION AND CONCLUSION

Unal (1998) could not find any significant difference (P> 0.05) in PLT levels after 8 weeks of chronic aerobic exercise. Similarly, there was no significant (P> 0.05) difference in PLT levels after chronic exercise applied to sedanter subjects in the study of Büyük yazı and friends(2002).

Drygas was determined in his study(1988) that moderate exercise did not change the platelet count and functions, the amont of platelet were increased by long-term exercise, and increased PF4 by consumer exercise.

Fıçıcılar (2004) emphasized after the research he done that it is important to show that the suppressive effects of platelet function may be emerged partially in the early stages by short-term training and exercises but the exercise protocol applied is not sufficient to reduce reported platelet aggregation in long-term training.

Wang et al. (1994) have shown that platelet adhesion and aggregation are increased in healthy individuals and angina pectoris patients with severe exercise (up to a 20-40 W load increase by 3 min).

Ersöz et al. (1997) found that parameters related to platelet function approximated the resting values after 1 hour of exercise for 30 minutes at 75% max. VO2 intensity applied to 12 healthy male volunteers.

As a result of our study, It was seen that there was no significant difference between the comparison groups between morning, evening and control group. In the analysis of the relationship between the variables, it was considered that the meaningful relationship between PLT and MPV, low MPV showed the newly produced thrombocyte deficiency and the relationship was directly proportional. The significant association between PLT 2, MPV 2 and PDW 2 was considered to be inversely proportional, as PDW had a high bone marrow gain in the case of low PLT. The PDW is; The significant relationship between AnaKah b, Running Speed a and Running Speed b increases as the running speed increases, an increased rate of heart rate is consequently considered as an increased bone marrow function.

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