Diabetes dance of persadia 1 effect on blood IL-6 level

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Abstract. Diabetes dance of Persadia 1 is the evolvement of prior diabetes dance series with aerobic principle and belong to weight bearing exercise with eccentric movement. The aim is to analyze the effect of Diabetes dance of Persadia 1 on blood level of IL-6.16 subjects of healthy housewifes who was participated and divided on 2 groups, exercise group and control group. Exercise group was given with diabetes dance of Persadia 1, 3 times per week, while control group have the unstructured activity. Blood level of IL-6 has been measured from each subject's blood that has taken after 24 hours post single bout exercise (acute-AE) and after repeated exercise (chronic exercise-CE)**.** Paired t-test analysis on both acute (p=0.674) and chronic (p=0.949) shows blood level of IL-6 increase on control group post test result, though its not significant, while it has been decrease significantly on exercise group both AE (p=0.000) and CE (p=0.000). This happen because the stimulation of endogenous antioxidant production that is gluthatione, thus lowering oxidative stress biomarkers by suppressing H_2O_2 production, resulting in NFkB inhibition. NFkB inhibition will decrease the production of IL-6 muscle. This study shows that diabetes dance of Persadia 1 is not increasing blood levels of IL-6.

1. Introduction

Interleukin-6 (IL-6) is a cytokine secreted by contracting muscle [1]. The amount of IL-6 secreted by muscles when exercising depends on the intensity and duration of the performed exercise [1], which, it found that the highest IL-6 secretion was found in subjects who did high intensity exercise [1]. A researcher states that the more muscles involved in exercise (the more muscles that contract) more IL-6 will be secreted. Another thing found in this study is that weight bearing exercise causes more IL-6 secretion than non-weight bearing exercise such as cycling, and eccentric and knee-extensor exercise [2].

One of the new exercises that have been evolved from prior diabetes dance series before is called diabetes dance of Persadia 1. Diabetes dance of Persadia 1 is a weight bearing exercises that are designed with more muscle eccentric movements [3]. Diverse and many movements variations indicate the number of muscles that contract. These contracting muscles trigger the release of IL-6 and can affect IL-6 levels in the blood. Acute diabetes dance of Persadia 1 has been investigated more effectively in lowering fasting blood glucose than prior diabetes dance series, but its effect on blood interleukin-6 levels is still unknown. Therefore, this study was conducted to determine the effect of Diabetes dance of Persadia 1 on blood IL-6 levels.

2. Material and Method

2.1. Type and design of research

This research is a field experimental research with two groups of pretest and posttest control group design. Ethical feasibility test has been carried out for this research by the Ethics Committee of the Health Research Faculty of Medicine, Universitas Airlangga Surabaya with the number of ethical feasibility certificate 187 / EC / KEPK / FKUA / 2018.

2.2. Research subject

Subjects who was participated in this research is 16 healthy housewifes of PKK Lidah Wetan Surabaya, which devided in two group by 8 subjects each group. Subjects were 25 - 45 years and had a BMI of 18-29.9 kg/m^2. Subjects who had Hepaactive category of IPAQ questionaire, impaired physical mobility, arthritis pain and diagnosed with diabetes were not included as research subjects.

2.3. Research protocol

2.3.1. Acute exercise

Both control and exercised group will undergo conditioning for 2 weeks. Conditioning is belonging to training procedure which subjects were instructed to do unstructured exercise either diabetes dance of Persadia 1 or other unscheduled exercise. After conditioning period is complete, exercised group subjects will be performed 1 session of diabetes dance of Persadia 1, while the control group continued to do unstructured activities. Each session was 30 menit and consist of 4 phases namely the warming up phase, core phase, transition phase, and cooling down phase. Blood samples were collected on the next day in both exercised and control groups.

2.3.2. Chronic exercise

Subjects for chronic exercise are the same subject as acute exercise. The difference is, in chronic exercise, there are repeated exercise for subjects. The exercised group continued the diabetes dance of Persadia 1 training program 3 sessions per week for 2 weeks. After the last exercise in second week of exercise a blood sample has been taken to evaluate blood IL-6 level after chronics exercise.

2.4. Blood IL-6 levels

Blood IL-6 levels were measured using a sample of blood serum taken 24 hours post exercise, and for further analysis using the ELISA (enzyme-linked immunosorbent assay) method. Elabscience Human IL-6 ELISA Kit which has a qualification certificate with a precision of <10% was used to measuring the blood IL-6 levels.

3. Results and Discussion

3.1. Sujects characteristics

Table 1 Subjects characteristics descriptive analyze

Variable	N	Minimum	Maximum	Mean	Deviation standard
Age (Years)	16	25.00	42.00	32.9375	5.83631
Weight (Kg)	16	48.00	70.00	58.3125	8.34840
BMI (Kg/m^2)	16	19.00	29.00	24.1250	2.91833

The biggest percentage of age category of this research subject is the age of 25-28 years as many as 5 samples (31%). Body weight of 65-70 kg is the most common category for research subjects, as many as 5 people (31%), while for BMI, overweight and obese categories have the same percentage of 6 people each category (37.5%).

3.2 Blood IL-6 levels before and after diabetes dance of Persadia 1

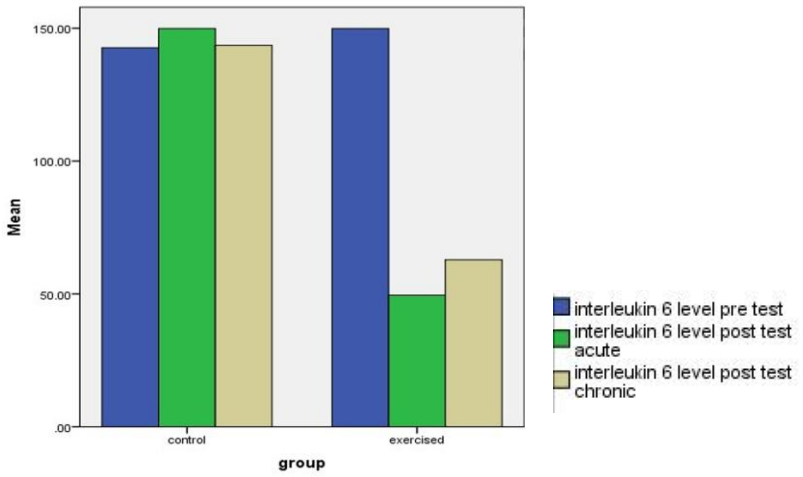

Figure 1 Bar chart of blood IL-6 levels

Figure 1 shows the level of IL-6 pretest and posttest in the control group (control) and the treatment group (exercised). The post-test results of the control group showed a significant change in IL-6 from the pre-test value in both acute conditions (p = 0.674) and chronic conditions (p = 0.949). Blood IL-6 levels in the control group both after acute and chronic conditions showed an increase compare with pre-test value, however, blood IL-6 levels in the control group that performed repetitive (chronic) exercise were even lower when compared with IL-6 levels after acute exercise, although the alteration is unsignificant (p = 0.517).

The treatment group (exercised) shows the opposite of the control group. Figure 1 shows that blood IL-6 levels in exercised group experienced significant changes in post test results in both acute exercise (p = 0,000) and chronic exercise (p = 0,000). Blood IL-6 levels in both acute and chronic treatment groups decreased from the pre-test value, while blood IL-6 levels after chronic exercise tend to increase significantly when compared with blood IL-6 levels after performing acute exercise (p = 0.021).

Table 2 Comparison of diabetes dance of Persadia 1 responses to blood IL-6 levels

Group	Acute exercise		Sig.	Chronic exercise		Sig.
	Pre test (pg/ml)	Post test (pg/ml)		Pre test (pg/ml)	Post test (pg/ml)	
Control group	142.63 ±39.24	149.89 ±41.02	0.674	142.63 ±39.24	143.55 ±31.01	0.949
Exercised group	149.89 ±41.02	49.53 ±19.26	0.000	149.89 ±41.02	6282 ±16.38	0.000

Sig. ≤ 0.05

3.3 Effect of acute exercise diabetes dance of Persadia 1 on blood IL-6 levels

The results obtained from this study were blood IL-6 levels in the exercised group decreased both in acute exercise and chronic exercise. Several factors that can cause a decrease in blood IL-6 include carbohydrate supplementation, oxygen supplementation, and antioxidant supplementation ([4], [5], [6], [7]). Blood IL-6 levels after acute exercise was significantly lower than the pre-test value can occur due to stimulation of endogenous antioxidants production, though research about this kind is still uncommon. A research results showed that acute exercise with high intensity and low intensity

can cause an increase in glutathione-S-transferase (GST) after the recovery phase [8]. Gosset et al. (1999) in their study found that glutathione inhibited the production of tumor necrosis factor-α (TNF-α), interleukin-8 and interleukin 6 through an independent mechanism of glutathione in the alveolar macrophages [9]. Gluthatione can suppress the production of H_2O_2 (Hydrogen peroxide) resulting from exercise resulting in NFκB inhibition[10]. NFκB inhibition causes muscle IL-6 production reduction so that blood IL-6 levels will be decrease.

Table 3 Comparison of diabetes dance of Persadia 1 respons to blood IL-6 levels after both acute and chronic exercise

Group	Post test		Sig.
	Acute post test (pg/ml)	Chronic post test (pg/ml)	
Control group	149.89±41.02	143.55±31.01	0.517
Exercised group	49.53±19.26	62.82±16.38	0.021

Sig. ≤ 0.05

3.4 Effect of chronic exercise diabetes dance of Persadia 1 on blood IL-6 levels

Chronic post-exercise IL-6 levels are also decreased, as well as acute post-exercise. This can occur because of the endogenous antioxidants stimulation after doing aerobic exercise namely diabetes dance of Persadia 1. A research conducted in 2018 found that aerobic exercise can significantly increase the level of antioxidant enzymes (glutathione peroxidase), which decreases biomarkers of oxidative stress[11]. This study concludes that aerobic exercise has an antihepatotoxicity effect characterized by an increase in HSP70 levels (70-kDa heat shock proteins) with p = 0.039, GPx (glutathione peroxidase) with p <0.001, and a decrease in MDA (malondialdehyde) levels with p <0.001, carbonyl tissue and protein in all age ranges (adolescents, adults, elderly). Glutathione peroxidase-1 (GPx-1) is an intracellular antioxidant enzyme which able to reduce hydrogen peroxide to water, limiting its harmful effects. Certain reactive oxygen species (ROS) such as hydrogen peroxide, besides having harmful effects, on the other hand are also very important for signal mediation of growth factors, mitochondrial function, and for the maintenance of thiol redox balance normality (thiol redox-balance). This can be modulated by GPx-1 by limiting the accumulation of hydrogen peroxide [12]. A study found that glutathione inhibited the production of tumor necrosis factor-α (TNF-α), interleukin-8 and interleukin 6 through an independent mechanism of glutathione in the alveolar macrophages[9]. Some researcher states that gluthatione can suppress the production of H_2O_2 (Hydrogen peroxide) resulting from exercise, thus will inhibit the NFkB secretion [3]. NFκB inhibition causes muscle IL-6 production reduction so that blood IL-6 levels decrease.

4. Conclusion

NFkB inhibition will decrease the production of IL-6 muscle. This study shows that diabetes dance of Persadia 1 is not increasing blood levels of IL-6.

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