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Original Article

The effect of wet cupping on physiological variables and the numerical achievement of elite runners in intermediate distances

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Abstract

Wet cupping is one of the alternative medicine methods recommended by Islam and which used in sport recently as an influential and important factor in sports performance. Recently, players have increased interest in wet cupping as a therapeutic method, as well as in improving athletic performance. objectives: The study target is to figure out if the wet cupping (Hijama) affected some physiological variables and the numerical achievement of elite players in intermediate distances, and also to try to determine the appropriate time to conduct it before the competition in intermediate distances. Study Design and application: We used a quasi-experimental method. The study was conducted on a purposive sample of fifteen runners from intermediate distances elites at West Bank-Palestine. In order to collect data of study variables we used three measurements, the first measurement was carried out before wet cupping, then the second measurement was carried out after three days of wet cupping, and the third measurement was carried out after five days of second measurement. Repeated measures of ANOVA was used to analyze data. Results: The study findings revealed that most physiological variables showed positive changes in all parameters with statistically significant differences between the three measurement means in favor of the last measurement. Also, the study showed positive changes in the record of running 1500 meter event with statistically significant differences between three measurement means in favor of the last measurement. Conclusion: wet cupping is effective to make appositive changes in physiological variables and in the numerical achievement of the elite runners in the intermediate distances. The researchers recommend that wet cupping be performed at least seven days before the competition in intermediate distances.
Key words: Alternative Medicine; Hijama; ANOVA; Sports Performance; West bank-Palestine, Experimental Method.

Introduction

Wet cupping (Al-Hijama) is one of the alternative medicine methods recommended by Islam and which has been widely used in sports recently as an influential and important factor in sports performance (Alshareef et al., 2021).Where this interest appeared during international competitions, starting with the Beijing Olympics in 2008 and ending with the Rio Olympics in Tokyo 2021, when many Olympic champions appeared with cupping marks on their bodies. Where cupping is seen as the process of extracting bad blood and toxins from the body by a vacuum cleaner, which is a cup-shaped vessel placed on the place that is being scaled in order to withdraw the bad blood outside the body (Kaleem et al., 2007). where the cups are placed over the skin until a bump appears on the skin, then this bump is conditional and the cups are placed again after striping after they are emptied from the air to suck the corrupt blood out of the surface of the skin (Al-Shehri, 2006).

Wet and dry water cupping and air cupping (massage cupping) are the most used types of cupping in the sports field due to their rapid effectiveness in treating muscle and joint fatigue and pain resulting from sports training, and it works to increase blood flow to cells, which helps speed recovery. Williams et al. (2012) indicated that cupping helps in the speed of recovery, relaxation and restoration of vitality for athletes from the training loads they had received and thus achieving the best form in terms of physical fitness. Mohammed & Abu al-Fida (2003) believes that cupping works to relax the heart, liver, kidneys, lungs, brain and all cells of the body, and activates the centers of latent and visible energy and blood circulation, and rids the body of toxins that are concentrated in it.

Al-Shehri (2006) added that cupping works through the small arteries and veins, activates and strengthens blood circulation, activates the body's reactions to the internal organs, and works to absorb toxins and drug effects from the body, strengthens the general immunity in the body, and regulates hormones in the seventh cervical vertebra. It harmonizes the psychological aspect through the parasympathetic and parasympathetic system responsible for anger, sadness, depression, emotions, cruelty, calmness and indifference, as well as working to raise pressure on the nerves due to congestion and enlargement of blood vessels, which puts pressure on the nerves, especially the head that causes headaches, and the absorption of excess acids that

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cause hypertrophy of red blood cells, which The density of the blood increases, which leads to a lack of blood circulation as a result of the lack of blood reaching the cells regularly.

http://sportscupping.blogspot.com/2011/11/normal-0-microsoftinternetexplorer4_19.html also stated that cupping increases the activity of creatine kinase and its production in the blood, which achieves a speedy recovering, the rate of local hemoglobin, and increases the rate of local hemoglobin. Calcium level in the blood, improving the body's resistance to the excess amount of oxygen free radicals that may negatively affect the cellular protein and (DNA) and the lipid membrane of the cell, and increases the immunoglobulin (IgG, IgA, LgM, C3, C4 and CD3+, CD 4 + ,CD 8) after cupping operation, also it increases Malone Dialdehyde, which is evidence of the body's disposal of toxins through urine, and helps to get rid of waste metabolites and strengthen the immune system. Cupping also increases ox hemoglobin and deoxyhemoglobi. Cupping makes local tissues in A case of less oxygen consumption with a high level of oxygen at the same time in the tissues, which benefits in improving metabolic processes and this was confirmed by the studies of (Dnyaneshwar, 2018; Dolton & Velasquez, 2017; Amir, 2014; Layla et al, 2012)

Although recent scientific studies have emphasized the importance of cupping as a modern scientific technique that has been widely used in sports circles recently as an influential and important factor in achieving sports performance, both during local and international competitions, it did not accurately determine the correlation between the physiological changes that occur within the body as a result of cupping procedure. And the sporting achievement that may be related to the improvement of the player's physical aspect, psychological aspect, or even mentality, and thus achieving the highest level of sporting form, In addition, it also did not specify the time period for the occurrence of important physiological changes related to sports achievement, which may be after the first day of cupping procedure or the third, fifth or tenth day, due to the importance of providing players and athletes with the appropriate time to conduct them before sports competitions. From here, the problem of the study appeared among the researchers, which It can be summarized by identifying the effect of wet cupping on some physiological variables and digital achievement among elite players in running middle distances in Palestine.

In addition to identifying the appropriate time to perform cupping before entering sports competitions and competitions, So the researchers hope that this study will provide results that help workers in the field of training to raise the level of athletes and reach them to the highest levels.

Wet cupping mechanism

The wet cupping was conducting by a physical therapist in his private clinic at 9 am, he has full experience for doing it. The wet cupping mechanism may be the same for everyone. In our current study, we depend on previse studies of (Syahruramdhani et al., 2021; Mustafa and Sabri, 2020; Umar et al., 2018). The wet cupping perform began with cleaning the sites with an alcohol pad. Sterile disposable cups measuring about (5 cm) in diameter were used. Putting the cups on five points of the posterior torsoebilateral perispinal areas of the neck and thoracic spine and starting suction (Fig.1). The cups were removed gently after about 5 minutes and a puncture to a depth of 2 mm was made in the area. Thereafter, the cups was put over the same sites after the puncturing was made, and the suctioning was repeated, draining about (5 cm^3) of blood per cupping. Finally, all puncturing areas were cleaned and dressed.

Fig.1: Multiple cups placement on the runner's back.

As a consequence of cupping therapy

As a consequence of cupping therapy, the skin's blood flow is increased, the skin's biomechanical properties are altered, the pain threshold is increased, the local anaerobic metabolism is improved, inflammation is reduced, and cellular immunity is modulated (Aboushanab & AlSanad, 2018). Using the immunomodulation theory, Guo et al. argued that cupping and acupuncture are both derived from the same mechanisms (Guo et al., 2017). A theory of immunomodulation suggests that skin stimulation can alter the microenvironment in a way that activates the immune system and neuro-endocrine system (Guo et al., 2017). The genetic theory, which Shaban and Rarvalia put forward, suggested that the skin's mechanical stress (from sub atmospheric pressure) and anaerobic metabolism (from partial oxygen deprivation) could cause physiological and mechanical signals to

be produced that could activate or inhibit gene expression during suction (Shaban & Ravalia, 2017). Scarification can activate wound-healing mechanisms and gene expression in wet cupping therapy. Various acupuncture studies have reported modulating gene expression (Aboushanab & AlSanad, 2018).

Materials and Methods

Method

The researchers used quasi-experimental method in order to achieve study aims.

Participants

The study conducted on a purposive sample of fifteen runners (N) from intermediate distances elites at west bank-Palestine. Table (1) illustrates the characteristics of the study sample.

Table (1): Characteristics of the study sample (N= 15).

Variables	Minimum	Maximum	Mean	Standard deviation	Skewness
Age (Year)	19	23	20.33	1.54	0.967
Height (Meter)	1.70	1.82	1.77	3.46	-0.694
Body mass (Kg)	60	73	69.66	3.37	-1.741

It is clear from the results of Table (1) that the values of the Skewness coefficient are between (± 3) and this indicates that the study sample is subject to the normal distribution.

Procedures

The researchers followed the following procedures in measuring the study variables**:**

- The pre-measurement of some physiological variables was performed on (27/11/2021) at exactly eight o'clock morning in the laboratory by taking blood samples from the veins in the elbow according to the scientific principles followed by gently attaching the compressor around the upper arm and then cleaning the traction area by wiping it with a cotton swab moistened with ethylene alcohol 70 %, and then the blood was drawn using a sterile, dry syringe and used for one time, by holding the elbow with the left hand and placing the thumb on the vein and away from the place of the puncture, then holding the syringe with the right hand, inserting it into the vein, then withdrawing 5-10 ml of blood, and severing the compressive band, then put a piece of dry cotton, and put pressure on the place where the sample was drawn to prevent bleeding.

The blood samples were placed in a special refrigerator at a temperature between 2-8 °C. The tests were carried out directly by using three devices as the following:

1- Medonic M-series: For CBC test. Medonic M-series 3-part hematology analyzer produced by Boule Medical for human application. The Medonic M-series is a fully automatic hematology analyzer intended for in vitro diagnostic testing of blood specimens under laboratory conditions.

2- FUJIFILM DRI-CHEM NX500: All chemistry tests. A multi-purpose automatic dry-chemistry analyzer featuring remarkably short turnaround time, a touch screen interface and reliability.

DRI-CHEM from FUJIFILM is a dry chemistry analyzer which can perform multiple test parameters of Clinical Chemistry. It has a built-in auto-pipetting system, requires no calibration, and no water, providing easy preparation and maintenance.

3- Hipro A1 POC: For Vitamin D3, and CRP titer. Automatic immunoassay analyzer. 3-level calibration system.

- The wet cupping therapy was performed on (29/11/2021).
- The second measurement was carried out after three days of wet cupping therapy on (02/12/2021) at exactly eight o'clock morning in the laboratory by following the steps of the pre-measurement.
- The third measurement of some physiological variables was carried out on (07/12/2021) at exactly eight o'clock morning in the laboratory by following the steps of the pre-measurement.
- The numerical achievement a measurement of running 1500 meter has been conducted at same dates after took blood sample directly.

Study variables

The study consisted of the following variables:

a. The independent variable is wet cupping therapy.

b. The dependent variables, which include the following:

- Physiological variables which include: Blood test (CBC: The Complete Blood Count) which contains on: (WBC: **White Blood Cells;** LYM: Lymphocytes; GRAN: Granulocyte; MID: Mixed: Basophil, Eosinophil, Monocyte**;** HGB**:** Hemoglobin; RBC**: Red Blood Cells;** HCT: Hematocrit; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin concentration; MCV: Mean Corpuscular Volume; RDW: Red Cell Distribution Width; PLT: *Platelets*); Lipid profile which contains on (Cholesterol; Triglyceride; HDL: High Density Lipoprotein; LDL: Low Density Lipoprotein); Glucose (FBS: Fasting Blood Sugar); Liver function (S.G.P.T: Serum Glutamic Pyruvic Transaminase); Kidney function (Urea and Creatinine); Vitamin (25-Hydroxcy V.D3); Serology (CRP: C-Reactive Protein); Ions & Electrolytes (Sodium, Potassium, Chloride, Magnesium, Calcium and Phosphorus); Irons (Iron and TIBC: Total Iron-Binding Capacity).
- Intermediate distances events: running 1500 meter.

Statistical analysis:

The researchers used IBM SPSS version 26 to analyze data by using means, standard deviations, Skewness and paired samples t test.

Results

Table (2) the differences between repeated measures means of blood (CBC) parameters (N=15).

Variable	Parameters	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Blood (CBC)	WBC (10^9/1)	3.5-10	5.31±1.43	5.21±1.37	5.05±1.55	0.823	-4.90
	LYM (10^9/1)	0.5 -5.0	2.08±0.56	2.04±0.56	1.83±0.52	0.404*	-12.01
	GRAN(10^9/1)	1.2 – 8.0	2.76±0.86	2.77±0.85	2.77±1.01	0.930	0.36
	MID(10^9/1)	0.1 – 1.5	0.44±0.13	0.46±0.13	0.47±0.11	0.292	6.81
	HGB (g/dl)	11.5-16.5	13.69±1.48	13.71±1.47	13.89±1.44	0.750	1.46
	RBC (10^{12}/1)	3.5-5.5	4.66±0.26	4.75±0.31	4.93±0.27	0.188*	5.79
	HCT (%)	35-55	39.53±3.84	40.00±3.79	41.27±3.72	0.388*	4.40
	MCH (pg)	25-35	29.42±2.43	28.97±2.35	28.17±2.40	0.089*	-4.25
	MCHC (g/dl)	31- 38	34.65±0.96	34.16±0.89	33.66±0.87	0.091*	2.85
	MCV (f1)	75-100	84.79±5.50	84.31±5.18	83.62±5.53	0.339*	-1.38
	RDW (%)	11-16	12.39±1.29	12.36±1.29	12.35±1.30	0.917	-0.32
	PLT (10^9/1)	100-400	230.93±38.08	233.26±36.08	238.13±29.63	0.915	3.12
	MPV (f1)	8-11	8.90±0.66	9.02±0.89	9.23±0.91	0.577*	3.71

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of Blood (CBC) parameters as follows: LYM, RBC, HCT, MCH, MCHC, MCV and MPV While, no significant differences in the least Blood (CBC) parameters means. However, the percentages of change were positive for all of Blood (CBC) parameters ranged between (0.32-12.01).

Table (3) the differences between repeated measures means of Lipid Profile parameters (N=15).

Variable	Parameters	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Lipid Profile	Cholesterol (mg/dl)	Up to 200	135±25.03	124.73±20.35	100.46±22.54	0.231*	-25.58
	Triglyceride (mg/dl)	Up to 150	69.00±23.21	69.53±21.45	73.86±22.75	0.804	7.04
	HDL (mg/dl)	Up to 55	36.13±4.67	38.13±4.48	45.20±2.59	0.156*	25.10
	LDL (mg/dl)	Up to 150	87.73±17.05	69.13±10.54	40.40±15.81	0.101*	-53.95

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of lipid profile parameters as follows: Cholesterol, HDL and LDL. However, No significant differences in triglyceride parameter mean. Whereas the percentages of change were positive for Cholesterol, HDL and LDL ranged between (25.10-53.95), then in triglyceride parameter was negative change equal (7.04).

Table (4) the differences between repeated measures means of Glucose parameter (N=15).

Variable	Parameter	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Glucose	F.B.S (mg/dl)	70-110	87.60±10.60	85.06±8.82	73.13±8.60	0.169*	-16.52

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of F.B.S. in favor to third measure mean. Whereas the percentage of change was positive equal (16.52).

Table (5) the differences between repeated measures means of Liver Function parameters (N=15).

Variable	Parameter	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Liver Function	S.G.P.T (U/ML)	Up to 40	32.53±16.30	22.46±6.99	9.41±0.22	0.789*	-71.07

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P ≤ 0.05).

There were statistically significant differences between three measurements means of S.G.P.T. in favor to the first measure mean. Whereas the percentage of change was positive equal (71.07).

Table (6) the differences between repeated measures means of Kidney Function parameters (N=15).

Variable	Parameters	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Kidney Function	Urea	10-50	25.20±4.03	23.13±3.46	19.60±3.85	0.101*	-22.22
	Creatinine(mg/dl)	0.6-1.3	1.01±0.09	1.00±0.09	0.96±0.09	0.393*	-4.95

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of Kidney function parameters**:** Urea and Creatinine. Whereas the percentages of change were positive for Urea and Creatinine equal respectively (22.22, 4.95).

Table (7) the differences between repeated measures means of Vitamin parameter (N=15).

Variable	Parameter	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Vitamin	25-Hydroxcy V.D3 (ng/dl)	30-100	15.06±3.87	15.26±4.07	18.14±4.74	0.621*	20.45

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of 25-Hydroxcy V.D3. Whereas the percentage of change was positive equal (20.45).

Table (8) the differences between repeated measures means of Serology Parameter (N=15).

Variable	Parameter	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Serology	CRP	< 5	3.42±0.45	3.26±1.57	3.06±1.16	0.876	-10.52

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

No statistically significant differences between three measurements means of CRP parameter mean. Whereas the percentage of change was positive equal (10.52).

Table (9) the differences between repeated measures means of Ions & Electrolytes parameters (N=15).

Variable	Parameters	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Ions & Electrolytes	Sodium (mmol/L)	135-155	142.33±2.25	141.53±1.95	140.00±0.92	0.538*	-1.64
	Potassium (mmol/L)	3.5-5.5	4.59±0.24	4.56±0.25	4.19±0.21	0.209*	-8.71
	Chloride (mmol/L)	95-110	100.33±3.33	99.66±3.06	96.20±2.30	0.261*	-4.12
	Magnesium (mg/dl)	1.9-2.5	2.13±0.12	2.12±0.11	2.06±0.12	0.620*	-3.29
	Calcium (mg/dl)	8.1-10.4	9.18±0.27	19.46±5.57	28.80±11.25	0.190*	213.73
	Phosphorus (mg/dl)	2.5-5.0	3.54±0.34	3.66±0.31	4.05±0.30	0.496*	14.41

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of Ions & Electrolytes parameters. Whereas the percentages of change were positive for all, ranged between (1.64-213.73).

Table (10) the differences between repeated measures means of Irons Parameters (N=15).

Variable	Parameters	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Irons	Iron (ug/dl)	59-148	63.86±41.44	95.93±71.30	123.26±79.89	0.350*	93.02
	TIBC (ug/dl)	274-385	499.73±149.19	466.66±145.08	396.60±160.46	0.094*	-20.64

Note: M: Mean; SD: Standard deviation; * Statistically significant at (P ≤ 0.05).

There were statistically significant differences between three measurements means of Irons parameters**:** Iron and TIBC. Whereas the percentages of change were positive for Iron and TIBC equal respectively (93.02, 20.64).

Table (11) the differences between repeated measures means of Intermediate Distance running (N=15).

Variable	Parameter	Normal value	Measure1 M±SD	Measure2 M±SD	Measure3 M±SD	Wilks' Lambda*	Change %
Intermediate Distance	Running 1500 meter	Minute	4.74±0.22	4.69±0.21	4.56±0.24	0.039*	-3.97

Note: M: Mean; SD: Standard deviation; * statistically significant at (P-value ≤ 0.05).

There were statistically significant differences between three measurements means of running 1500 meter. Whereas the percentage of change was positive equal (3.97).

Discussion

CBC

The study results were demonstrated that wet cupping has a significant effect on LYM, RBC, HCT, MCV, MCH and MCHC. The current results indicated that cupping resulted in a significant decline in LYM count comparatively with others differential WBCs; as Abdullah et al. study that demonstrated the effectiveness of cupping therapy on the management of persistent rheumatoid arthritis (RA) - which characterized with increasing the inflammation markers - by some significant reduction in lymphocytes count (p-value <0.04), WBC (p-value<0.03), and neutrophils (p-value<0.01) (Abdullah et al., 2021). In this context, the ability to control one special parameter like, LYM without effecting on the others considered as a clever solution to manage numerous diseases. In contrast, after cupping, RBC counts were slightly higher, similar to the findings published previously (Soleimani et al., 2019). In other words, when the number of red blood cells increases, the hematocrit percentage increases, and they are directly related (Abdullah et al., 2021).

This could be due to a possible change in erythropoietin levels following cupping therapy caused by iron depletion (Mustafa and Sheiko, 2020). The Rate of MCV, MCH, and MCHC were reduced during this study after wet cupping, and this finding concordant with Soleimani et al. study that has also decreasing in RBC, and HB (Soleimani et al., 2019). Other parameters like, WBC, GRAN, MID, HGB, PLT, and RDW were significantly none changed or remain unchanged. In comparison with the results of the previous studies, we can conclude that the results of the study conducted by (Abdulsattar et al., 2014) which showed significant elevation in the total WBC count and neutrophil count in comparison with the baseline results, are inconsistent with the results of this study (Abdulsattar et al., 2014). In the other side, the findings of our study are in agreement with Mustafa and Sheiko, which demonastrated no significant changes in WBC, RDW, and PLT (Mustafa and Sheiko, 2020).

Lipid Profile

Hypercholesterolemia occurs when blood plasma cholesterol levels are excessively high, increasing the risk of cardiovascular disease (El-Ghaffaar et al., 2020). In the current study, cupping therapy had a positive effect on serum cholesterol levels by decreasing total cholesterol and LDL levels as well as increasing HDL levels. It is thought that wet cupping is detoxifying because it removes pathological substances from the blood, including cholesterol and LDL, by scarifying the skin and sucking the blood (El-Ghaffaar et al., 2020). Prior studies comparing cupping blood with venous blood have confirmed the blood detoxification effect of cupping (Al-Bedah et al., 2019).

The cupping blood had higher levels of cholesterol than the vein blood (Al-Bedah et al., 2019). In this context, HDL levels are significantly increased by wet cupping therapy. These results could be supported by Widada and Anggrain (2020) finding that cupping therapy had a significant effect on the increasing means HDL value. The principal function of HDL is to remove cholesterol from the body and return it to the liver, and it is also involved in inflammation (Widada & Anggraini, 2020). HDL acts directly on monocytes to inhibit the inflammatory response (Widada & Anggraini, 2020). Wet cupping promotes the production of HDL cholesterol, which acts as a carrier for LDL cholesterol (Saeed et al., 2021). A higher level of HDL increases liver LDL cholesterol transport (Saeed et al., 2021). As cholesterol is transported to the liver, it is excreted as bile salts. This results in a decrease in serum LDL cholesterol levels. The current study showed no significant differences in the mean values of triglycerides, and this result conflicted with Rahman et al. (2020) study, which illustrated that wet cupping significantly reduced the cholesterol, triglycerides, and low-density lipoprotein**.**

Glucose

This study showed significant reductions in fasting blood sugar (FBS) in participants who received wet cupping treatment, which is in agreement with different previous studies suggesting wet cupping can be used as a complementary therapy for individuals with diabetes (Rahman et al., 2020). According to Husians et al. (2020) FBS was significantly lower up to four months following the baseline results. Physiological and biochemical improvements were demonstrated by the significant improvements in FBS following wet cupping treatment (Husain et al., 2020). It has been shown in a recent study that wet cupping therapy improves insulin sensitivity in subjects with normal glucose levels and normoferritinemia (Sutriyono et al., 2019). The bleeding from hijamah has been found to decrease glucose levels in patients with diabetes (Sutriyono et al., 2019).

Liver Function

This finding indicated that wet cupping safe the liver from damage and keep his function in high efficiency, Rasyid et al.(2020) supported this result that the parameter to determine the presence or absence of liver damage is an increase of more than three times the upper limit of normal of SGPT levels. So SGPT considers as indicator of liver status (Wong, Ooi, & Ang, 2000). The study results were demonstrated that wet cupping had a positive effect and decline count of S.G.P.T parameter.

This result accepted with study result of Bilal et al.(2011) which showed decrease in serum SGPT level in comparison to venous blood sample.

Kidney Function

The glomerular filtration rate is determined by urea and creatinine levels (Husain et al., 2020). It is known that urea can predict the development of hypertension and mediate the systemic inflammatory response, which can lead to cardiovascular problems (Husain et al., 2020). A higher serum creatinine level indicates that the glomerular filtration rate has been compromised (Saeed et al., 2021). Wet Cupping Therapy revealed substantial reductions in serum urea, and creatinine with percentage change reached to 22.2%, and 4.95 %, respectively. These differences were parallel with previous studies.

The results were agreed with a study conducted by Saeed et al. though, in Malaysia, a study performed at one and four months revealed significant drops in serum creatinine compared to baseline (Husain et al., 2020). So, preventing and reducing chronic renal disease may be possible with wet cupping therapy. Cupping therapy for kidney disease patients as one of the best physical therapies, cupping therapy has many benefits to patients suffering from chronic kidney diseases. It can promote circulation of blood and lymph, regulate endocrine disorders so as to increase blood flow to the kidneys and much improves renal ischemia and hypoxia (Hasan et al., 2014).

25-Hydroxcy Vitamin D3

Vitamin D acts in the control of plasma calcium levels, strengthening the immune system, improving balance, preventing premature aging, protein synthesis, muscle function, cardiovascular function, inflammatory response, cell growth and musculoskeletal regulation (Caprio et al., 2017; Cashman et al., 2016). The current results indicated that wet cupping resulted in a significant increase and positive changes in vitamin D3 level. The results were agreed with a study conducted by Baharith et al. that wet cupping increase vitamin d which reduce bones pain (Baharith et al., 2019).

An improvement in the level of vitamin D positively affects athletic performance and its decreasing does the opposite, Yague et al. confirmed that more and more athletes also show a low vitamin D status, which may negatively impact the health, performance, and training efficiency of athletes (Yague et al., 2020). Vitamin D inadequacy may result in declining training quality along with increased incidence of injury and illness (Hamilton., 2011). Vitamin D status may have an impact on muscle performance and injury prevention, therefore possibly influencing athletic performance (Ogan & Kelly, 2013).

Serology

C-reactive protein (CRP) is used mainly as a marker of inflammation (Pepys & Hirschfield, 2003). Measuring CRP values can be useful in determining disease progress or effectiveness of treatments (Ismailov et al., 2005). Wet cupping is applying a sudden stress to the body's immune system in order to activate it against all internal and external factors (Madari & Jacobs, 2004). The study results were demonstrated that wet cupping had positive effect and decline count of CRP parameter. The current result accepted with study result of Ahmed et al.(2005) which showed Cupping has also been demonstrated to be effective in declining rheumatoid arthritis-related inflammatory markers such as CRP. But the current results conflicted with the study result of Ismailov et al.(2005) which showed increase in CRP level and in his thought that issue injury by performing of cupping could be increase of CRP levels after two weeks.

Ions & Electrolytes

The study results were demonstrated that wet cupping had a positive effect on serum of ions & electrolytes parameters such as reducing Sodium, Potassium, Chloride, & Magnesium. In other side, it increasing calcium and phosphorus. The researchers clear this due to the role of wet cupping in improving kidney functions and regulating ions & electrolytes in the body. Wissam (2017) supported our explanation, he found a significant decrease in serum creatinine and potassium level after Hijamah, hence all these changes indicates that there have been improvement in renal function in patients after making Al-Hijama. The current result could be supported by Abbas et al.(2020) (2020) finding that Serum electrolytes level showed an significant increase in serum Calcium ions after one and two weeks of making Al-Hijama and also showed decline in serum sodium, chloride and potassium ions after one and two weeks of making Al-Hijama**.** Abbas et al.(2020) indicated that cupping may be consider safe technique, might be associated with decreased risk of cardiovascular disease, obesity and improved kidney function test**.**

Irons

The study results were demonstrated that wet cupping has a positive and significant effect on Iron and TIBC. The current results indicated that cupping resulted in increasing iron and declining TIBC count. The current results conflicted with the study result of El-Shanshory et al. which cleared that Al-Hijama decreases iron over load (through excreting iron, ferritin and tissue damaging oxidants in the cupped bloody excretion) and consequently decreases iron-induced free radical generation (El-Shanshory et al., 2018). Lee et al.(2008) study Showed a relationship between cupping and Iron deficiency. The current result could be supported by Fairouz (2010) finding that TIBC parameter level was decreased after cupping.

Intermediate Distance

The study results were demonstrated that wet cupping has a positive and significant effect on the numerical achievement of running 1500 meter. Running performance is limited by the potential to provide the energy required to cover a given distance via aerobic and anaerobic metabolism (Beneke & Hütler, 2005). Cupping works to raise the level of aerobic sports performance by working on getting rid of red blood cell ghosts and also gets rid of a large rate of free radicals (Mohammad, 2004). Also, cupping conducting works on the production of young red blood cells and increasing them which make blood more ability to supply the bod of oxygen, food and getting rid from wastes, Isam supported this in his study on swimmers that cupping improved the performance time in swimming 1500 meter in free style, this refer to get rid of free radicals which makes fatigue when it increase (Isam, 2009). Cupping restore a normal circulation, Increased circulation in turn improves oxygen supply and cell metabolism (Lauche et al., 2012). The results were agreed with a study of Antush results which suggested that acute cupping therapy increases steady-state carbon dioxide expiration in well-trained runners without changing oxygen consumption. This has implications for enhanced buffering from putative increased localized blood, which could have an impact on endurance running performance (Antush, 2019).

Conclusion

Cupping has a positive effect on the organs of the human body. Therefore, it is considered a means of preventing or decreasing the risk of the occurrence of chronic diseases such as atherosclerosis, diabetes, hypertension, renal failure, etc. The present study concluded that wet cupping is effective to make appositive changes in physiological variables even in reducing or increasing parameter values that stayed within normal distribution. On the hand, wet cupping is effective to make appositive changes in the numerical achievement of the elite runners in the intermediate distances, especially after at least seven days from conducting it. Finally, there is also a need for more studies to know the effectiveness of wet cupping on other physiological variables and sport achievement among players in all sport games.

Conflict Of Interest

No potential conflict of interest relevant to this article was reported.

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