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Effect of Vitamin E (Alpha Tocopherol) Supplementation on Sports Performance of Male Weightlifters in Pakistan

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Abstract
Health is essential for the common man in general and for the sportsmen in particular. Weightlifting is an intense sport, since competitors draw on all their mental and physical strength to lift massive weights, often more than twice their own body weight. Vitamin is an organic compound, the need of which is fulfilled automatically, but due to odd selection of food, deficiencies of the vitamins persist, environmental conditions and health effects vitamins are required to be taken orally. The objective of the current study is to examine the effect of vitamin E on muscle strength of male weightlifters of Pakistan through change in their best weightlifting capacity and serum tocopherol level after supplementation of Cap. Evion 600mg containing Alpha Tocopherol 600mg for a period of 4 months in different groups of male weightlifters of Pakistan using pre-test post-test analysis. Paired sample t-test was used to measure the mean change in best weightlifting capacity and serum tocopherol level (µg/mL) whereas serum tocopherol was measured using ELABSCIENCE® Vitamin E (VE) Colorimetric Assay Kit (Kit No.: E-BC-K033-S). Statistical analysis will be done using SPSS Version 24.0.

Introduction of the Study
Vitamin E is a fat-soluble nutrient that plays a crucial role in maintaining human health. . One of the primary functions of Vitamin E is its role as an antioxidant (Rizvi et al., 2014). It helps protect cells from damage caused by free radicals, which are unstable molecules that can harm cells and contribute to the development of various diseases. Vitamin E is important for maintaining a healthy immune system. It supports immune function by protecting immune cells from oxidative stress. There is evidence suggesting that Vitamin E may help protect against cardiovascular disease by preventing the oxidation of LDL cholesterol (often referred to as "bad" cholesterol), which can lead to plaque buildup in arteries (Sinatra & Roberts, 2010). Exercise-induced muscle damage is a normal part of training, and adequate recovery is crucial for muscle growth and adaptation. Vitamin E may support muscle recovery by reducing inflammation and oxidative stress, which can help alleviate muscle soreness and improve recovery time between workouts (Brentano & Martins, 2011). Maintaining cardiovascular health is important for athletes, including weightlifters. Vitamin E's role in protecting against oxidative damage to LDL cholesterol and promoting overall cardiovascular health may be beneficial for athletes who engage in

rigorous training. Vitamin E's anti-inflammatory properties may also contribute to joint health and mobility, which can be important for weightlifters who put significant stress on their joints during heavy lifting (Ammar et al., 2016). An athletic discipline of weightlifting is a part of modern Olympic Games in which a weightlifter attempts to lift maximum weight on barbell loaded with weight plates (International Weightlifting Federation, www.iwf.net, retrieved 2024-07-08). Weightlifting competitions categorized in order of the snatch and the clean & jerk, every weightlifter gets 3 attempts in each category of snatch and the clean & jerk and collective total of the maximum two successful lifts decides the end result in a bodyweight class (International Weightlifting Federation, www.iwf.net, retrieved 2024-07-08). There are different bodyweight classes for men and women, for a complete entry in competition a weightlifter has to lift weight successfully at least once in both categories of the snatch and the clean and jerk (International Weightlifting Federation, www.iwf.net, retrieved 2024-07-08). Olympic weightlifting is an assessment of human explosive strength (Ballistic limits) and is therefore performed with speed and more mobility and with superior range of motion in contrast of other strength sports (International Weightlifting Federation, www.iwf.net, retrieved 2024-07-08). Both the snatch and the clean and jerk are explosive and dynamic if executed properly, especially it looks attractive and elegant when seen from a recording at a slower motion (International Weightlifting Federation, www.iwf.net, retrieved 2024-07-08).

Literature Review

Vitamin E is a fat-soluble vitamin, meaning your body absorbs and transports it like dietary fats (Ravisankar et al., 2015). It is also an antioxidant, a compound that fights free radicals, which raise your risk of getting certain diseases, but antioxidants clean up their damage. Alpha-tocopherol is the most common type and is found in the highest quantities in your body's tissues and liver (Galli et al., 2022). But that does not mean other types are less valuable. Each form of vitamin E has its own unique antioxidant abilities and food sources often contain a mix of two or more types of vitamin E. As an antioxidant, vitamin E helps ward off cancer-causing cell damage. Some evidence shows that low levels of vitamin E and selenium may raise your risk of breast and lung cancer (Haque Ripon et al., 2020). Vitamin E has a protective effect on the cells in your eyes. And getting enough of this nutrient could lower your risk of age-related macular degeneration (AMD) and cataracts. Vitamin E may help prevent blood clots that could cause heart attacks. But don't start popping vitamin E in place of blood thinners or other medications (Emmert & Kirchner, 1999).

It is well accepted that physically active individuals are generally healthier than sedentary people (Demirci et al., 2018). This can, in part, be attributed to their adoption of a lifestyle that includes regular exercise, proper and balanced nutrition, abstention from smoking and drug use, and moderation in alcohol intake. Among the athletes and individuals with regular physical regimens, general nutrition and the many individual components of daily foods have received great attention not only for maintaining energy balance but also for improving performance among the elite (Thomas et al., 2016). In addition, compelling scientific evidence supports the importance of food and particular nutrients in the prevention of degenerative disease such as cancer and cardiovascular diseases. Scientists and health professionals have introduced the concept of an oxidant/antioxidant balance in order to explain some of the effects observed with changes in diet and exercise (Sutkowy et al., 2024). This concept has also been translated into lay language to promote healthy lifestyle choices to the public. Of the nutrients, vitamin E has received considerable attention for its antioxidant function in living organisms and its beneficial effects on health. It is the most effective natural antioxidant in the biological system, and has been found to play an important role in preventing cardiovascular disease and certain types of cancer, as well as improving the immune system. It has also been suggested that vitamin E may have an important role in reducing the oxidative stress associated with exercise, thereby improving the oxidant/antioxidant balance (Peternelj & Coombes, 2011). Vitamin E deficiency in humans is rarely observed; however, marginal deficiency without apparent clinical symptoms may occur, especially among elderly people, individuals engaged in strenuous physical activity or training, and in those consuming a high-carbohydrate, low-fat diet without adequate dietary intake of antioxidants, such as vitamins E and C and carotenoids. Vitamin C may spare vitamin E utilization in the body and recycle the oxidized form of vitamin E back to its reduced form. High intake of vitamin E has been shown to reduce numerous indices of oxidative stress, prevent muscle damage, and possibly increase endurance during exercise in experimental animals through its ability to scavenge free radicals (Higgins et al., 2020). In normal cell metabolism, about 2% of oxygen escapes the mitochondrial electron transport system resulting in the formation of reactive oxygen species (ROS) (Angelova & Abramov, 2016). Elevated levels of oxygen-derived, highly reactive free radicals that exceed the antioxidant capacity of tissues are known to damage several critical cellular components such as DNA, proteins and the polyunsaturated fatty acids (PUFAs) of membrane phospholipids. In lipid membranes, free radicals can trigger chain reactions leading to lipid peroxidation, release of toxic aldehydes, and loss of membrane integrity and organization. Exercise substantially increases total oxygen consumption in skeletal muscle, which already has one of the highest oxygen requirements of all tissues, thereby leading to enhanced production of free radicals which implicates ROS in the etiology of exercise-induced muscular dysfunction (Silva et al., 2009). During maximal exercise whole body oxygen consumption increases up to 20-fold whereas oxygen consumption within skeletal muscle may be elevated by as much as IOO-fold with proportionate increases in ROS. Vitamin E readily accumulates in skeletal muscle tissue where it functions as a potent, intramembrane antioxidant and protects muscle tissue from potential injury (Orucha et al., 2011). Evidence suggests that vitamin E may be differentially distributed between muscle fibre types because type I fibres have been reported to contain higher a-tocopherol levels than muscle containing mostly type II fibres (Azzi, 2018). Brief, intense exercise has not been shown to alter vitamin E content in tissues significantly; however, vitamin E concentration has been demonstrated to decrease in human skeletal muscle after eccentric exercise and in rat skeletal muscle after endurance training. Substantial decreases of tissue vitamin E after training suggest increased free radical production during exercise, which ultimately consumes tissue stores of vitamin E (Baggett, 2015). Thus, it is likely that vitamin E confers protection on skeletal muscle against exercise-induced free radical formation and, furthermore, increases of vitamin E levels in tissues through dietary supplementation may markedly augment this protection.

Over-exercising, dehydration and mineral deficiencies are key reasons. When you push yourself too hard during heavy exercise, your muscle membranes are damaged (Swartz & Wright, 2019). Dehydration, after a vigorous workout, also causes your muscles to cramp up. Pregnancy, age and medical conditions associated with circulatory changes and stress are other risk factors. During a strenuous exercise routine, your oxygen consumption is increased by 10-20- fold and your body also produces high number of free radicals (Sachdev & Davies, 2008). This increases the oxidative stress and interferes with the process of membrane repair. Vitamin E with its fights these free radicals, helping your cell and muscle membranes heal faster. Vitamin E acts as a defense against muscle damage by cell-nourishment from oxidative stress. Additionally, to treat muscle cramps, you can also try self-care measures such as hot and cold showers, body stretches, yoga and massages (Balch et al., 2011). Vitamin E foods and their benefits like green vegetables, pumpkin, nuts and seeds, can also do wonders. Vitamin E is important to athletes because it is an antioxidant and may help to prevent some of the oxidative damage that may occur from exercise (Taghiyar et al., 2013). This oxidative damage, caused by free radicals, may interfere with the cells' ability to function normally and is believed to play a role in many different health conditions, including the aging process, cancer, and heart disease. Vitamin E promotes a healthy immune system and may help to prevent the dip in immune function that may occur right after exercise. Vitamin E may also help to ease muscle cramps (Monye & Adelowo, 2020). Athletes and fitness advocates may claim benefits for this supplement based on their personal or professional experience.

Vitamin E toxicity is very rare and supplements are widely considered to be safe. The National Academy of Sciences has established the daily tolerable upper intake level for adults to be 1,000 mg of vitamin E, which is equivalent to 1,500 IU of natural vitamin E or 1,100 IU of synthetic vitamin E (Bell & Grochoski, 2008). In a double-blind study of healthy elderly people, supplementation with 200 IU of vitamin E per day for 15 months had no effect in the incidence of respiratory infections, but increased the severity of those infections that did occur (Thorburn, 2009). For elderly individuals, the risks and benefits of taking this vitamin should be assessed with the help of a doctor or nutritionist. In contrast to trials suggesting vitamin E improves glucose tolerance in people with diabetes, one trial reported that 600 IU per day of vitamin E led to impairment in glucose tolerance in obese people with diabetes (Levy et al., 2004). The reason for the discrepancy between reports is not known. In a double-blind study of people with established heart disease or diabetes, participants who took 400 IU of vitamin E per day for an average of 4.5 years developed heart failure significantly more often than did those taking a placebo (Holman et al., 2017). Hospitalizations for heart failure occurred in 5.8% of those in the vitamin E group, compared with 4.2% of those in the placebo group, a 38.1% increase. Considering that some other studies have shown a beneficial effect of vitamin E against heart disease, the results of this study are difficult to interpret. Nevertheless, individuals with heart disease or diabetes should consult their doctor before taking vitamin E. A review of 19 clinical trials of vitamin E supplementation concluded that long-term use of large amounts of vitamin E was associated with a small (4%) but statistically significant increase in risk of death (Rimm, 2001). Long-term use of less than 400 IU per day was associated with a small and statistically nonsignificant reduction in death rates. This research has been criticized because many of the studies on which it was based used a combination of nutritional supplements, not just vitamin E. For example, the adverse effects reported in some of the studies may have been due to the use of large amounts of zinc or synthetic beta-carotene, and may have had nothing to do with vitamin E. It is also possible that long-term use of large amounts of pure alpha-tocopherol may lead to a deficiency of gamma-tocopherol, with potential negative consequences (Ghosh et al., 2020). For that reason, some doctors recommend that people who need to take large amounts of vitamin E take at least part of it in the form of mixed tocopherols. Patients on kidney dialysis who are given injections of iron frequently experience "oxidative stress." This is because iron is a pro-oxidant, meaning that it interacts with oxygen molecules in ways that may damage tissues (Halliwell, 1996). These adverse effects of iron therapy may be counteracted by supplementation with vitamin E. This research will show that how improvement in serum tocopherol level can be managed by uniform and supervised oral supplementation procedure which may produce momentous musculoskeletal sports fitness benefits. It is pertinent to mention that there is no research study is available regarding vitamin E supplementation usage in male weightlifters.

Rational of the Study

- Present work, regarding effect of Vitamin E on muscle health of male Weightlifters which will be helpful in reducing the risk of muscle injuries.
- Male Weightlifting Players having muscle injuries so they will be advised to check their Serum tocopherol levels (µg/mL) for the recommendation of supplements.
- Prior knowledge about Serum tocopherol level (µg/mL) is of great value regarding its role in male athlete's muscle health.

Objectives of the Study

- Collection of adequate numbers of male Weightlifting players.
- Selection of required numbers of players from Weightlifting with recommended inclusion criteria.
- Development of pre-test analysis on behalf of serum tocopherol level (µg/mL) of players.
- Designing of a general training program according to serum tocopherol level / vitamin E deficiency of players.
- Development of post-test analysis on behalf of serum tocopherol level of players.

Hypothesis

- There will be an increase in the strength of male Weightlifters due to vitamin E supplement.

Research Methodology

Subject Selection

- Elite class male weightlifters (n=150) of age between 19 - 28 years and body weight from 55 to 76kg were selected from different weightlifting, powerlifting and bodybuilding clubs of Lahore, Gujranwala, Sialkot and Faisalabad. Their consent to participate in this study was taken on consent form by giving personal data, oral intake of Vitamin E and provision of blood sample after approval of this research protocol.

Research Design

- As pre test analysis, data of all these players were recorded with key features of their name, age, body weight, body weight class, sports, lifting best total in weightlifting events (Snatch + Clean and Jerk) (International Weightlifting Federation, www.iwf.net, retrieved 2024-01-01) along with serum calcidiol level (ng/ml).

Serum Tocopherol Measurement Protocol

- Serum tocopherol level of all players in three groups was done by using ELABSCIENCE® Vitamin E (VE) Colorimetric Assay Kit (Kit No.: E-BC-K033-S) (Darband et al., 2020).

Categorization / Grouping

- Based on their serum tocopherol level (µg/mL): All the players were divided into three groups named as Group A (Serum tocopherol level below 12 nmol/L or 9.18 µg/mL called deficient): Group B (Serum tocopherol level between 12.1-22.0 nmol/L or 9.19-16.83 µg/mL called insufficient) and Group C (Serum tocopherol level above than 30 nmol/L or 22.95 µg/mL called optimal) (Peter et al., 2015) from male Weightlifting players.
- A separate but generalized (for all players) game specific training program for Weightlifting was developed according to their lifting best total (Kgs).
- All three groups were treated with once daily oral dose of Cap. Evion 600 (A product of Martin Dow (Pvt.) Ltd.) containing 600mg of vitamin E according to deficiency (Traber, 2014) under the supervision of a registered medical practitioner, pharmacist and other paramedical staff by observing all ethical aspects.

Post Test (Mid Term)

- After two months treatment, a post test (Mid Term) of best lifting total was checked and recorded.
- A comparative study was done on behalf of
  - Improvement in best lifting total from pre-test to post-test (Mid Term).
  - Improvement in serum tocopherol level from pre-test to post-test (Mid Term).
- A statistical analysis between change in serum tocopherol level and performance improvement was evaluated by using SPSS version 24.0 officially named IBM SPSS statistics was used for all statistical analysis.

Sub Grouping of Participants / Athletes

- After Post Test (Mid Term) all three groups divided into further two sub groups of each group as group A is divided into A1 and A2, group B is divided into B1 and B2 and group C is divided into C1 and C2 according to the deficiency.
- Then A1, B1 and C1 was again treated with once daily oral dose of 600mg of vitamin E and group A2, B2 and C2 was treated with placebo.
- A separate but generalized (for all players) game specific training program for Weightlifting was developed according to their best total.

- After two months' treatment, a post test (Final Term) of best lifting total was checked and recorded. A posttest (Final Term) of serum tocopherol level was measured by using ELABSCIENCE® Vitamin E (VE) Colorimetric Assay Kit (Kit No.: E-BC-K033-S) through a patent pathological laboratory of Lahore, Pakistan and recorded containing columns Player Name, serum tocopherol level and lifting best total.
- A comparative analysis was done on behalf of change in best lifting total from pre test to post test (Final Term) and same comparative study of serum tocopherol level was also done from pre test and post test (Mid Term) and then post test (Final Term).

Data Analysis

A statistical analysis between change in serum tocopherol level and performance change was evaluated by using SPSS version 24 officially named IBM SPSS statistics. Paired sample t-test was used to measure the mean change in serum tocopherol level and mean change in best weightlifting capacity of players.

Paired Sample T-Test for Male Weightlifters

A paired sample t-test was applied to every participant of all three groups of male players for weightlifting regarding their serum tocopherol level (nmol/ml) and best lifting record (Kgs) to see the mean change in the best lifting total and their serum calcidiol level. The outcomes showed that there was a considerable increment in serum calcidiol level (nmol/L) of pre-test and post-test (mid-term) when supplement (Cap. Evion 600mg) was given to the examined male weightlifters for a period of 60 days on each of the three groups A, B and C. After post-test (mid-term) all three groups were sub-divided as Group A is segregated A1 and A2, Group B is segregated in B1 and B2 and Group C is segregated as C1 and C2 from which A1, B1 and C1 were again treated with Evion 600nmol/L for an additional two months while Placebo treatment was given to the A2, B2 and C2. A noticeable change/increase in mean serum tocopherol level and mean best lifting total was found in A1, B1 and C1 after post-test (final-term) compared to post-test (final-term) by measuring through paired sample t-test. Essentially, the best lifting total of male weightlifting players was likewise escalated in Groups A1, B1 and C1 because paired Sample t-test showed a significant difference ($P<0.5$) between the outcomes of post-test (Mid-term) and post-test (Final-term). Groups A2, B2 and C2, which were treated with a placebo treatment for two months, showed that there was no noticeable change ($P\geq0.5$) in serum tocopherol level of these groups regarding their Post-test (mid-term) results; the equivalent was the situation with the best lifting total of these group, paired sample t-test showed that there was noteworthy difference ($P\geq0.5$) between best lifting total of groups A2, B2 and C2 concerning their post-test (Mid-term) results (As shown in Table 1 and Table 2).

Table 1: Showing Paired Sample T-test outcomes of serum tocopherol level (nmol/L) of female weightlifting players of Group A (A1, A2), B (B1, B2) and C (C1, C2) for Mean and ±S.E. of Mean at three levels, as Pre-test, Post-test (Mid-term) and Post-test (Final-term). P is represented by * and **.

Groups	Time Period: Treatment	Tests: n	Serum Tocopherol Level Mean (nmol/L)	±S.E. Mean	Correlation (r^2)	t-value	p-value
A		Pre-test: 90	11.90	.40	.84	36.38	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 90	17.74	.44			
A1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 50	17.78	.61	.98	34.44	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-test):50	28.83	.73			
A2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 40	17.13	.19	.97	.582	.565**
	Next 8 Weeks: Placebo	Post-test (Final-term):40	17.14	.19			
B		Pre-test: 40	21.32	.55	.95	33.97	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 40	27.42	.57			
B1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 22	27.10	.28	.91	40.46	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-test): 22	35.29	.39			
B2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 10	27.41	.76	.99	3.18	.006*
	Next 8 Weeks: Placebo	Post-test (Final-term): 18	27.39	.74			
C		Pre-test: 20	33.61	.20	.11	10.37	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 20	40.43	.64			
C1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 13	40.90	.88	.98	25.87	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-term): 13	47.09	.70			
C2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 7	40.48	.53	.94	12.27	.052**
	Next 8 Weeks: Placebo	Post-test (Final-term): 7	40.45	.48			

***P<.05, **P>.05**

Table 2: Showing Paired Sample T-test outcomes of Best Lifting Record (Kgs) of weightlifting players of Group A (A1, A2), B (B1, B2) and C (C1, C2) for Mean and ±S.E. of Mean at three levels, as Pre-assessment, Post-assessment (Mid-tenure) and Post-assessment (Final-tenure). P is represented by * and **.

Groups	Time Period: Treatment	Tests: n	Best Lifting Total Mean (Kg)	± S.E. Mean	Correlation (r^2)	t-value	p-value
A		Pre-test: 90	199.19	3.37	.99	59.33	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 90	210.83	2.42			
A1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 50	206.21	3.98	1.00	58.21	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-test):50	212.06	4.01			
A2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 40	215.46	3.95	.99	.38	.68**
	Next 8 Weeks: Placebo	Post-test (Final-term):40	215.57	4.02			
B		Pre-test: 40	198.31	4.03	.99	58.92	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 40	212.13	4.11			
B1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 22	212.07	4.41	1.00	29.77	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-test): 22	217.86	4.49			
B2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-test): 10	208.20	4.89	.99	3.34	.041*
	Next 8 Weeks: Placebo	Post-test (Final-term): 18	208.60	4.91			
C		Pre-test: 20	217.90	2.41	.99	62.22	P<.001*
	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 20	225.40	2.53			
C1	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 13	227.60	4.03	1.00	22.99	
	Next 8 Weeks: Cap. Evion 600mg/day	Post-test (Final-term): 13	232.80	4.01			
C2	First 8 Weeks: Cap. Evion 600mg/day	Post-test (Mid-term): 7	223.20	.98	.99	4.93	.126**
	Next 8 Weeks: Placebo	Post-test (Final-term): 7	222.60	.99			

***P<.05, **P>.05**

Discussion

It is a matter of concern for the professionals in general and the sportsmen in particular that they should remain healthy and maintain their health. It is commonly observed that the general masses become vitamin E deficient because of varied reasons; the sportsmen are no exception to it the data to this effect in particular reference to Pakistan is not available. Each and every sport calls for certain pre requisite as well as the supporting elements. Psychologically the sportsmen feel relaxed, competent in discipline and handle the performance by acting out and not by self-reflection. They do not lose heart and keep on taking risk to improve even in their personal record. The term power applies to the weightlifter even; they concentrate in the second or third lift by visualizing and psyching up. Their repetition, make them learn to like the sport, and compromise the training to heel up their pulled muscles. The weightlifters are to be patient, stick to their sport and keep on repeating. All these qualities can be inculcated into the sportsmen related to weightlifting but the vitamin E level plays a vital role. That is required to be continuously checked to avoid any hazard.

Studies support the findings that Cap. Evion 600mg on once daily influences muscle strength and balance (Wicherts et al., 2007). serum tocopherol lower than 22 nmol/L is associated with lower physical performance (Sohl et al., 2013). Supplementation with Cap. Evion 600mg for 4 months in older mobility-limited men with moderately low vitamin E status increased intramyonuclear VDR concentration and muscle fiber size (Ceglia et al., 2013). Vitamin E supplement of 600mg per day may reduce the incidence of muscle lethargy by about 10–20% in an old, vitamin E deficient population (Lips, Gielen, & van Schoor, 2014). There are certain studies that tell us that provision of vitamin E enhances the participatory life of the sportsmen. The association between low serum tocopherol concentration and low physical performance therefore remains mainly uncertain for muscle strength (Annweiler, Schott, Berrut, Fantino, & Beauchet, 2009). Vitamin E is recommended as a basic therapy for all forms of muscle lethargy, i.e. should be given together with any specific medication (Ringe, 2012). There is little scientific evidence that vitamin E supplementation improves performance in athletes that are not vitamin E deficient. Nonetheless, based upon the evidence that many athletic populations are vitamin E deficient or insufficient, it is recommended that athletes monitor their serum vitamin E concentration and consult with their health care professional and/or nutritionist to determine if they would derive health benefits from vitamin E supplementation (Powers, Nelson, & Larson-Meyer, 2011).

Conclusions

The following are the conclusions;

- The increase in serum tocopherol level was recorded at the pre test, post-test (mid-term) and post-test (Final term). That serves as a proof that the provision of Cap. Evion 600mg supplement, showed a marked change not only in the increase in serum tocopherol level, but that of muscle health also because it serves as a prerequisite for it.
- At the second level it was observed that sportsmen performance increased in the weightlifting with the provision of Cap. Evion 600mg supplement.
- It was also divulged that the performance increased in the overall lifting with the provision of Cap. Evion 600mg supplement.

Recommendations

- It is recommended that there should be a regular physical examination for serum tocopherol level and supplement be provided under the supervision of a professional medical practitioner and follow up of the same be done as a regular feature.
- Muscle health tests should be continuously conducted for the ease and best performance of the sports person.

- Training be managed as regular feature in view of the needs both pathological and professional skills as well as the safety of muscle health of the sports person.
- It is further recommended that the sports persons be exposed to the films shows, talk shows and open houses to make necessary consultation for the maintenance of the muscle health as well as the performance of the sport.

Suggestions

- All the Weightlifters should be checked for Serum tocopherol status before joining Weightlifting sport.
- All Senior weightlifting players should be monitored at least twice a year for their serum tocopherol level.
- There should be more focus on young athletes (age b/w 12 - 20 years) for their Vitamin E supplementation for better bone and muscle growth.
- There should be a Vitamin E supplementation awareness program for clubs and players governed by National Federations / National Olympic Committee and Sports Board at least once in a year for better outcomes and preventive measures from Injuries in Weightlifting sport.
- There should be subsidized rates for Serum Tocopherol Test for Weightlifters and all other strength sports persons where Vitamin E has its vital role in their Sports.
- As Men Weightlifting is increasing day by day so there should be free supplementation arranged by National Federations for male players at the venue of National, Provincial Championships.
- Old age / Retired Players of Weightlifting should also be taken into consideration for proper Vitamin E Supplementation.

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