CONSUMPTION EFFECT OF PROTEIN SUPPLEMENTS IN THE BIOCHEMICAL PARAMETER FOR SOME YOUNG MUSCLE BUILDERS

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ABSTRACT

Many people take protein supplements in an effort to gain muscle. However, there is some controversy as to whether this is really effective. There is evidence suggesting that consuming high levels of protein may in fact have negative side effects for health. The current study included 29 young Iraqi building muscles in two different groups (taken and not protein supplements) (age range=17-31 years), the cases were selected from family, friends, college students, and Gyms, from November 2014 to March 2015. A careful history was obtained from each volunteer including age, duration of sports, type of supplements, and family history of diseases. Some biochemical parameters like (glucose, urea, uric acid, creatinine, bilirubin, serum protein, serum albumin, triglyceride and alanine aminotransferase (ALT), as well as thyroid hormones (TSH, T3, and T4)) were estimated in the sera of the groups under study. The results indicated non-significant differences in the studied parameters in both groups (taken and not protein supplements), and significant differences in the body mass of young men building muscles that taken protein supplements from different origins (USA, Malaysia, Swiss, UK) when compared with the group that not taken any supplements.

Key words: Building muscles, Protein supplements, Alanine amino transferase, Kidney function, Body mass index.
INTRODUCTION

Bodybuilding supplements are dietary supplements commonly used by those involved in bodybuilding and athletics (Powers and Howley 2001). Bodybuilding supplements may be used to replace meals, enhance weight gain, promote weight loss or improve athletic performance (King, 1999; Mansky and Strauss, 2002).

Among the most widely used are vitamin supplements, protein, branched-chain amino acids (BCAA), glutamine, essential fatty acids, meal replacement products, creatine, weight loss products and testosterone boosters. Supplements are sold either as single ingredient preparations or in the form of "stacks" - proprietary blends of various supplements marketed as offering synergistic advantages. While many bodybuilding supplements are also consumed by the general public, their salience and frequency of use may differ when used specifically by bodybuilders (Powers and Howley 2001). Consuming high levels of protein in the form of protein powders or even from food alone can be detrimental for our health (Morales, 1998; Kolasinski, 2003). There are some side effects of protein supplements like: Fat gain, Bone loss, Kidney damage, and Dehydration (Lemon, 1991).

PATIENTS AND METHODS

Patients

Inclusion criteria

Twenty nine consecutive young Iraqi building muscles were selected from family, friends, college students, and Gyms, from November 2014 to March 2015 were included in the present study, with mean age value of (22.75± 5.5) and age range between (17-31) years. Sixteen young men volunteers from the cases under study were taken protein supplements while the other thirteen were not taken protein supplements. Careful information was obtained from each volunteer in this study including age, duration of sport, and body mass index (BMI).

Methods

A sufficient amount (7-10 ml) of venous blood was obtained from each subject included in this study. The blood was allowed to clot in serum tube naturally at room temperature, and then separated by centrifugation at (1500 ×g) for 10 minutes. Haemolysis was avoided and the sera was divided into 5 aliquots, all samples were labeled by a serial number and the person's name, immediately frozen at -34C for further processing, once thawed, refreezing was avoided. Fasting blood glucose, urea, creatinine, Alanine aminotransferase (ALT), serum albumin, and serum total protein were determined based on the procedure given by randox reagent kit manufacturer while serum triacylglycerol, uric acid, total billirubin, were determined by linear kit manufacturer. Total Thyroxine T4, Triiodothyronine T3, and Thyroid Stimulating Hormone TSH were estimated by Micro ELISA redder Biokit (U.S.A).

Statistical Analysis

The data were analyzed by Duncan's multiple range test at (p ≤ 0.05) was accepted as statistically significant, and highly significant when (p ≤ 0.001), using the SPSS software. All the analyses were repeated three times.

RESULTS AND DISCUSSION

The mean ages of the volunteers included in the current study were (22.75± 5.5 years) with age range between (17-31 years), the mean duration of exercises was (2.28±3.33 years) with duration range between (2 month-10 years), and the body mass index (BMI) of young men building muscles under study was (27.39± 5.12 Kg/m²) with range (from 17 to 37.96 Kg/m²). The results in table (1) showed the distribution of young men building muscles groups according to taken or not taken protein supplements.
Table (1): Mean values ±SD (Range) of age, duration of sport, and body mass index (BMI) of young men building muscles under study according to taken or not taken protein supplements.

<table>
<thead>
<tr>
<th>Young men building muscles</th>
<th>Samples number (n)</th>
<th>Mean Age ±SD (Range)</th>
<th>Mean Duration of Sport ±SD (Range)</th>
<th>Mean BMI ±SD (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taken protein supplements</td>
<td>16</td>
<td>22.4±2.5 (17-28)</td>
<td>0.97±1.27 (2month-4 years)</td>
<td>28.06±5.24 (21.5-37.96)</td>
</tr>
<tr>
<td>Not taken protein supplements</td>
<td>13</td>
<td>23.23±3.4 (18-31)</td>
<td>2.28±3.8 (3month-10 years)</td>
<td>26.5±5.07 (17-34.85)</td>
</tr>
</tbody>
</table>

The mean values of thyroid gland hormones concentrations TSH, T₃ and T₄ showed non-significant differences between volunteers taken protein supplements group when compared with volunteers not taken protein supplements group as table (2) presented thyroid gland hormones concentrations.

Table (2): Mean values of serum TSH,T₃&T₄ in young men building muscles under study according to taken or not taken protein supplements.

<table>
<thead>
<tr>
<th>Group</th>
<th>Samples number (n)</th>
<th>TSH mlU/ml</th>
<th>T₃ ng/ml</th>
<th>T₄ nmol/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taken protein supplements</td>
<td>16</td>
<td>2.57±0.7 (1.6-3.1)</td>
<td>2.4±0.85 (1.7-3.6)</td>
<td>11.2±2.7 (8.6-14.3)</td>
</tr>
<tr>
<td>Not taken protein supplements</td>
<td>13</td>
<td>2.5±1.1 (0.9-4.6)</td>
<td>2.7±0.49 (2-3.3)</td>
<td>9.15±3.36 (5.2-14)</td>
</tr>
<tr>
<td>P value</td>
<td>P&gt;0.05</td>
<td>P&gt;0.05</td>
<td>P&gt;0.05</td>
<td>P value</td>
</tr>
</tbody>
</table>

The alterations in some biochemical markers that have been measured in the current study were illustrated in table (3); where no significant increases (p>0.05) were obtained in the studied parameters (Fasting blood glucose, triglyceride, creatinine, urea, uric acid, serum albumin, serum total protein and ALT) when compared between young men building muscles groups taken or not taken protein supplements.
Table (3): Mean values ±SD (Range) of some biochemical markers of young men building muscles under study according to taken or not taken protein supplements.

<table>
<thead>
<tr>
<th></th>
<th>Taken protein supplements</th>
<th>Not taken protein supplements</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose (mg/dl)</td>
<td>86±11 (60-109)</td>
<td>102.92±32 (72-174)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>Triglyceride (mg/dl)</td>
<td>84.8±33 (42-170)</td>
<td>77.6±33.1 (30-149)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>1.1±0.5 (0.5-2.4)</td>
<td>0.86±0.27 (0.6-1.5)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>Urea (mg/dl)</td>
<td>27.9±7.1 (12-40)</td>
<td>28.08±6.1 (17-42)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>S.uric acid (mg/dl)</td>
<td>4.9±2.1 (1.9-8.4)</td>
<td>4.6±1.34 (2.5-6.5)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>T.bilirubin (µmol/L)</td>
<td>0.83±0.29 (0.3-1.2)</td>
<td>0.96±0.5 (0.4-2.4)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>S.albumin (g/dl)</td>
<td>4.5±0.89 (3.5-6.5)</td>
<td>4.4±0.42 (3.9-5.1)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>T.protein (g/dl)</td>
<td>8.4±1.6 (4-10)</td>
<td>7.6±1.1 (6.3-10.6)</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>ALT (IU/L)</td>
<td>23.1±11.3 (9-43)</td>
<td>23.8±9.7 (9.9-45)</td>
<td>P&gt;0.05</td>
</tr>
</tbody>
</table>

Arginine, ornithine, histidine, lysine, methionine, and phenylalanine are purported to have anabolic effects. Two studies reported that ingestion of arginine and ornithine in conjunction with strength training significantly increased body mass and decreased body fat compared to a placebo (Nissen, 1996; Volpi, 2013). However, body composition was only estimated from skinfold measure, and diet was not controlled. It is claimed that these amino acids stimulate a release of growth hormone and insulin, and thereby increase muscle mass (Van leemputte et al., 1999; Welle et al., 1990; Breen, 2013). The protein requirement of athletes during strength training is 1.4 to 1.8 g along with adequate energy; this protein can be obtained through the normal diet without protein supplements. Although “high tech” protein supplements include a variety of additives purported to boost weight gain, they have never been tested to evaluate their efficacy, and it seems unlikely they would be more effective than diet alone or a supplement such as casein (milk powder) (Wagenmakers, 1999; Frisoli, 2011).

Several formulations of amino-acid supplements have been claimed to increase blood levels of growth hormone and insulin, thereby resulting in increased muscle mass, but studies have not systematically confirmed these effects (Berrut, 2013). The results in (Figure1) showed significant increases p<0.05 in the body mass index of young men building muscles that taken protein supplements (29.02Kg/m²) from different origins (USA, Malaysia, Swiss, UK) when compared with the group that not taken any supplements.
Nutritional supplements are often advertised using deceptive and/or misleading claims. They can be marketed without the US Food and Drug Administration (FDA) review of safety or effectiveness, and many claims are unsubstantiated. The concentration of active ingredients can differ markedly from product to product due to the lack of regulatory control (Morley et al., 2010; Wall and van Loon, 2013). Studies of the effects of nutritional supplements on muscle mass have predominantly used male subjects. There is a lack of information on female responses to these supplements and on their effectiveness in individuals with different initial physiological status of the nutrient in question (Elam, 1988; Burd, 2013; Beasley et al., 2013). Although some studies indicate that creatine and HMB may increase body weight, their effects on strength and performance remain unclear, the amount of gain is relatively small, and the results are yet to be adequately replicated. Nutritional supplements will not convert the 97-pound weakling into Charles Atlas. Moreover, nutritional supplements, even combined with strength training, will not give even Charles Atlas the physique of bodybuilders that grace the covers of today’s “muscle” magazines (Prentice, 2011; Tieland et al., 2012; Elam et al., 1989).

**CONCLUSION**

To our knowledge few reports are available in the literatures concerning studying the biochemistry changes in young men building muscles who taken protein supplements. Our present study highlights the relationship between some chemical parameters and building muscles in young Iraqi men. Further study must carry out with large number of cases to investigate this relationship more deeply in these men.
REFERENCES


