

Research article

Effect of Protein Supplementation on Biochemical Factors Such as Creatinine, Urea, and BUN, Among Libyan, Body Building Athletes

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Abstract

Ten healthy males strength and power athletes, (22.8±4.49 years old of age) randomly selected to take part in this study. Subjects were required to arrive at the laboratory in the early morning following an overnight fast for blood draws. Serum was analyzed for creatinine, urea, and BUN concentration at the Biomedical Ibsina Center, in Derna city. The results showed that the subjects taking protein supplement (without monitor) induces an increase in muscle protein synthesis. This study found that these effects were directly related to age. This results showed significant correlation between urea ($p \leq 0.02$), and BUN concentration ($p \leq 0.01$) with increasing age.

Keywords: body building athletes men, BUN, urea, Creatinine levels.

Introduction

The aim of this study was to examine the effect of protein powder intake on biochemical factors such as blood urea nitrogen (BUN), urea, and creatinine, levels among Libyan athletes males. The blood urea, creatinine and BUN levels can provide useful information about kidney function. The concentration of creatinine and BUN in serum is the most widely used and commonly accepted measure of renal function in clinical medicine. The BUN is measurement that represents the level of urea in the blood. Urea is considered one of the body's waste products. It is produced when the liver participates in protein metabolism, and it is usually eliminated from the

body by the kidney. The elevation of the BUN can be affected by either changes in increased protein catabolism (large meat protein meals, severe stress, or impaired renal function. The serum Creatinine is more specific. It is the breakdown product of creatine phosphate released from skeletal muscle at a steady rate. It is filtered by the glomerulus. Men tend to have higher levels of creatinine because they have more skeletal muscle than women. Vegetarians tend to have lower creatinine levels, because vegetables contain no creatinine. A blood urea nitrogen (BUN) test measures the amount of urea in the blood. Like creatinine, it can help to see how well kidneys are working.

Material and methods:

Ten healthy males strength and power athletes, (22.8±4.49 years old of age) randomly selected to take part in this study. Exercise more than twice per week. Subjects completed a dietary history questionnaire to verify that they were healthy. No significant difference in daily caloric intake was observed between subjects, all subjects not taking medications and were free from cardiovascular, or respiratory disease. and each subject provided written, informed consent to participate. Subjects were required to arrive at the laboratory in the early morning following an overnight fast for blood draws. Blood was collected from resting athletes, a blood sample was drawn from the antecubital vein between 8 to 10 a.m., in a sitting position after 12 h of fasting for biochemical investigations. Blood samples were then allowed to clot, and then serum was obtained by centrifuging at 4000rpm (Cenformix). To assess compliance with the experimental protocol. Serum was analyzed for creatinine, urea, and BUN concentration at the Biomedical Ibsina Center, in Derna city. Plasma samples were stored at -80 °C and later analyzed for blood urea nitrogen. The supplement was in powder form, subjects consumed one teaspoon (10-20g) with 250 ml water or milk twice a day. No difference was seen in energy intake between subjects.

Statistical Analysis:

All values were expressed as mean ± standard deviation (SD). Statistical analyses were performed using commercial software of Statistical Package of Social Science SPSS® version 14.0 for Windows professional 7. Significance was accepted at $P < 0.05$.

Results:

Table 1 showed the parameter analysis. This study reported that creatinine level was increased with age increasing but there was not a statistically significant difference ($p > 0.05$) as showed in figure 1. A positive relationship was observed between urea, and BUN with increasing age. There was a statistically significant difference ($p < 0.05$) between urea, and BUN levels with age.

Creatinine level (mg/dl) increased with increasing period intake (months) as showed in figure 2.

Table 1: Blood levels of athletes (n=10)

Parameter	Mean	SD	t value
Age (years)	22.8	4.49	16.05
Weight (kg)	75.7	8.76	27.298
Height (m)	1.68	0.09	57.266
BMI (kg/m ²)	26.5	1.81	46.245
Duration of protein suppl. intake (months)	18.2	9.95	5.78
Urea (mg/dl)	41.7	13.9	9.35
BUN (mg/dl)	19.2	6.90	8.79
Creatinine(mg/dl)	2.8	5.30	1.67

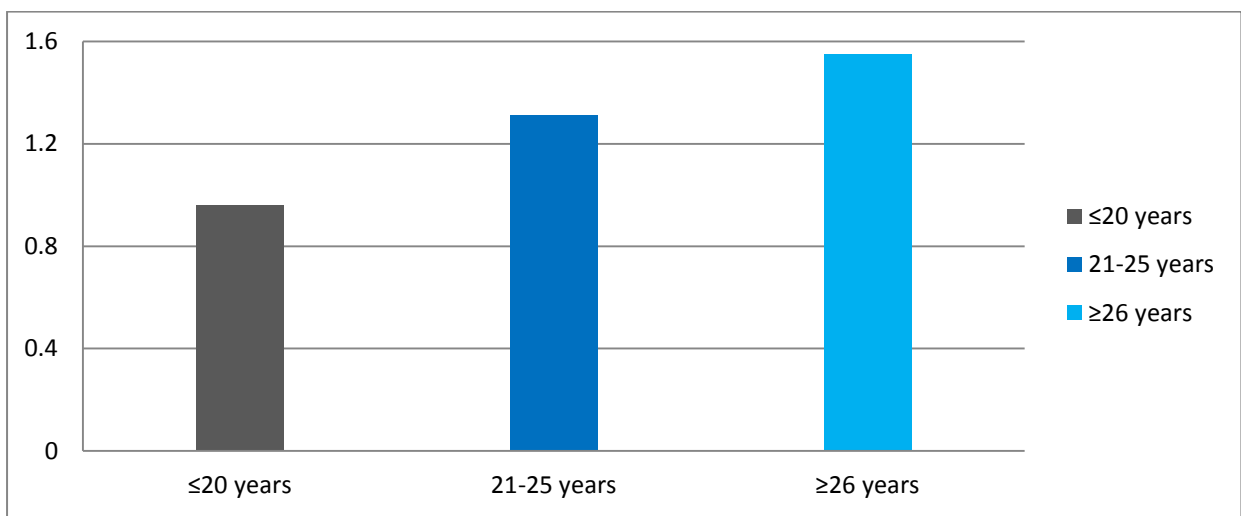


Figure 1: shown the relationship between creatinine levels (mg/dl) and age (years).

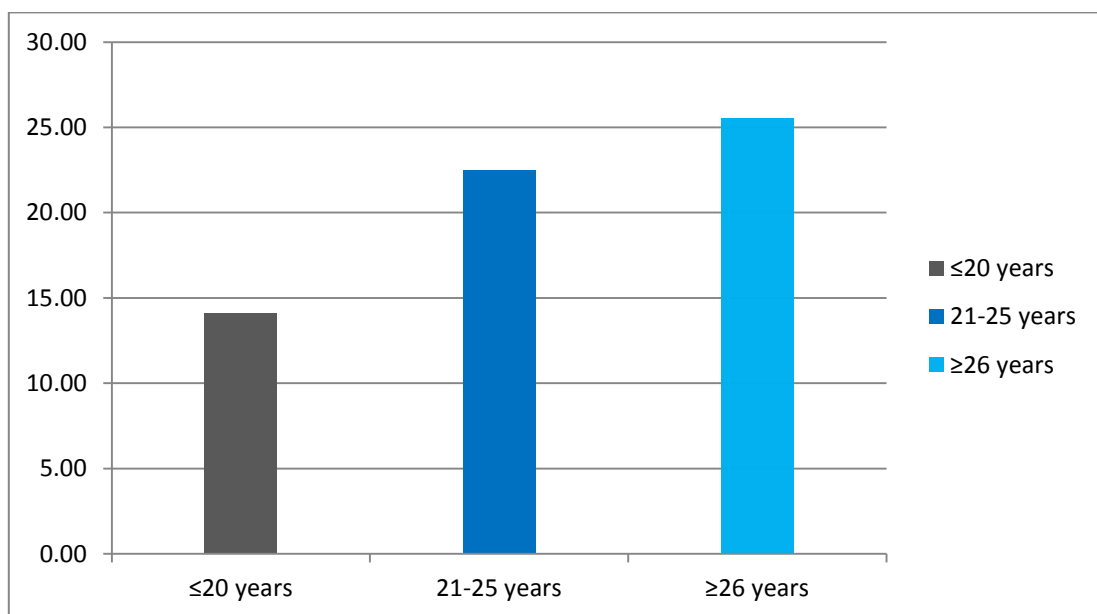


Figure 2: shown the relationship between BUN levels (mg/dl) and age (years).

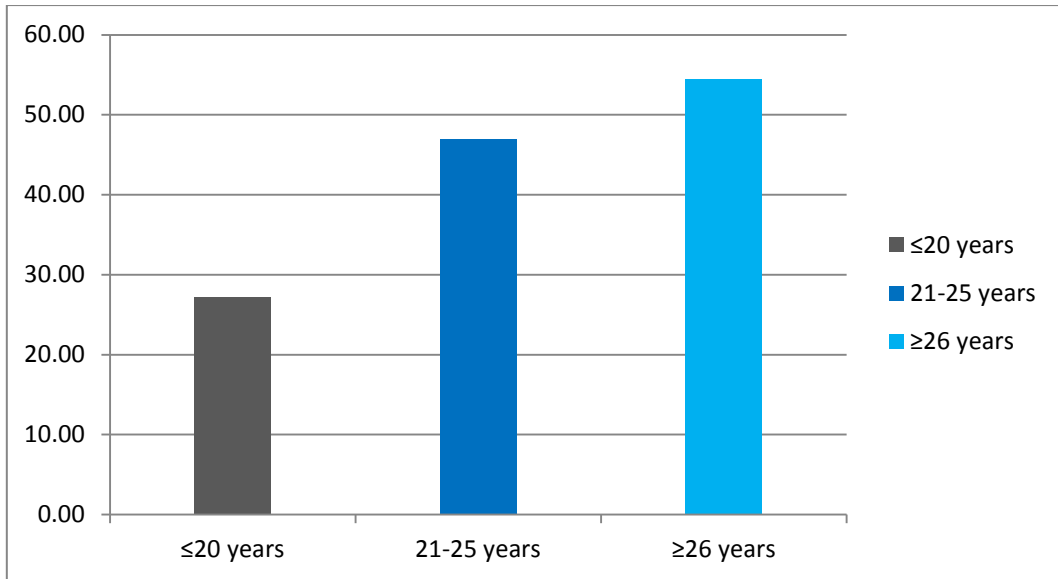


Figure 3: shown the relationship between urea levels (mg/dl) and age (years).

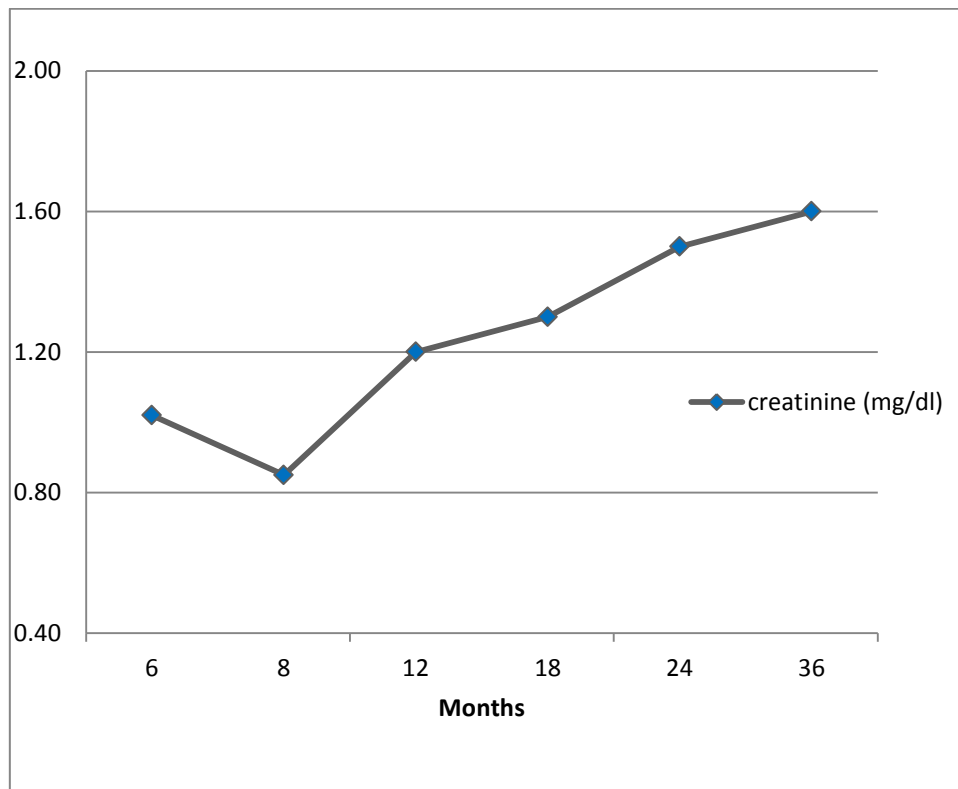


Figure 4: Shown relationship between creatinine levels and period intake (months).

Discussion:

A person with only one kidney may have a normal level of about 1.8 or 1.9 mg/dl, Creatinine levels that reach 2.0 or more in babies and 10.0 or more in adults may indicate the need for a dialysis machine to remove wastes

from the blood. Having a low level of blood creatinine indicates nothing more than an efficient and effective pair of kidneys. Dehydration generally causes BUN levels to rise more than creatinine levels.

This results showed that the subjects taking protein supplement (without monitor) induces an increase in muscle protein synthesis. There is also little evidence that supplementation of these amino acids during training significantly affects body composition, strength, and or muscle hypertrophy (5). The increase in protein synthesis reduces nitrogen excretion in the form of urea, can be followed by an increase in creatinine, BUN, and urea leading to problems such as hepatic encephalopathy (2). Serum creatinine as an indirect marker of glomerular filtration rate is affected by age, sex, race, diet and mainly body mass index (3).

This study found that these effects were directly related to age. Athletes on a high protein supplements may have higher-than-normal levels of urea in the bloodstream. Our results revealed a significant increase in serum urea, BUN, and creatinine levels. The concentration of creatinine in serum is the most widely used and commonly accepted measure of renal function in clinical medicine (4). This results showed significant correlation between urea ($p \leq 0.02$), and BUN concentration ($p \leq 0.01$) with increasing age. This results indicated that protein supplementation increased biochemical factors such as urea, creatinine, and BUN concentration.

Conclusion

Based on the results we can conclude that the most abnormalities observed on routine biochemical screening for the factors related to kidney functions such as urea, creatinine, and BUN levels among Libyan athletes are of no clinical significance. In conclusion, a significant association has been found between serum urea & BUN level and the age. It means that the kidneys have been damaged severely and active treatments to protect kidneys and prevent further renal damage are quite important.

Recommendation

It would be worth to stress that those who have suspected renal dysfunction should avoid any protein supplementation. Anybody using this supplement should be warned about this possible side effect, and their renal functions should be monitored regularly.

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