Effects of creatine on resistance training literature review sample

Introduction

Among the recent sports supplements that has created skepticism, enthusiasm, interest and promise is creatine. It has become one of the most popular nutritional complements because of its ability to improve short-range exercise performance and increase the strength of muscles. Even though many sports people have experienced good results with creatine, many others blame it for dangerous physiologic changes. Among the changes that it causes are liver damage, weight gain, renal stress, muscle cramping and muscle tensions.

Most studies that have investigated ergogenic benefit of creatine reports increase in power and strength, sprint performance and work performed during multiple sets of maximal effort muscle contraction. This is attributed to increase in TCr and PCr content. Athletes such as weightlifters and bodybuilders gain strength after using Cr and are often accompanied by muscle hypertrophy. Therefore the use of CrS is very beneficial. Data presented by Dawson et al. (1997) reveal that athletes digesting 5g per day together with a 10 week heavy resistance training program significantly increase power and strength.

According to Wyss and Kaddurah, a male is estimated to have a creatine content of 120grams. Its turnover is 2grams daily. Their study further indicates that two-thirds of the total creatine content exists in phosphorylated form in the human body. Its level in skeletal muscles varies according to muscle fiber type, person’s age and disease. Rejuvenation rates of phosphocreatine have been found to decrease by 8% after every ten years in individuals who are 30 years and above. During exercise,

phosphocreatine supply to the skeletal muscles increase immensely. Its hydrolysis rate is also high during such times. This gives a larger muscle endurance capacity. As a result one can train continuously since the muscles have the strength to overcome the training barrier.

According to Schneider et al. (1997), athletes using creatine supplement increases the amount of work performed during a series of maximal effort muscle contractions. In an experiment to find out the effects of CrS in press and bench squats, it was found that the use of creatine supplement increased the repetition during bench press and jump squats. This improvement in training is related to an increase in energy substrate availability and resynthesis.

Creatine supplement also increase or improve single effort or repetitive sprint performances mostly in sprint lasting between six to thirty seconds. According to Pearson et al. (1997), creatine supplement taken 20 g per day for five days significantly increases work performed during sprints and the report is seconded by Schneider et al (1997) who reported that a 25g per day taken in seven days improves 5 by 15’s cycle ergometer sprints with sixty second recovery between sprints. In the conclusion of a case study to investigate the effectiveness of repeated CrS loading phases, it was found that creatine is useful in sports such as rugby that require repeat sprint efforts and that creatine might be beneficial as an aid improving both training and performance.

There are a number of studies that report no ergogenic benefits from creatine. However, the reasons given to support these reports are not clear. Greenhaff (1997) estimate that 30% of individuals who use creatine may not respond with augmented total creatine. In a study on female swimmers of

Australian National Team, creatine supplement does not enhance performance in maximal single effort swim sprint.

There is no definite evidence that creatine causes gastrointestinal, muscle-cramping and/ or renal complication. An investigation by Kreider et al. (2003) found out that creatine does not adversely affect markers of health status in athletes who take intense training compared to those who do not. However, the only significant side effect as reported by various scholars is that of weight gain within the first few days and its probable cause is water retention related to Cr up take in the muscle.

Greenhaff and MacDougall examined the effects of creatine supplementation during resistance exercise. They found that the isokinetic knee torques is increased by creatine supply during recurrent sets of knee extensions (MacDougall, 1996). During each set, the peak power increased and the muscular strength also increased. They further demonstrate how creatine supplementation can be used in the treatment of diseases where creatine creation is introverted. This indicates the important role played by creatine in instances where muscle atrophy is present. However, the various studies that have been done fail to show the exact amount of creatine accumulation in muscle with creatine supplementation and the magnitude of muscle fiber hypertrophy. However, the likely explanation for the increase weight can be water retention. Additionally, creatine stimulates protein synthesis. It is due to this factor that the supplementation of creatine has continuously been used as a performance enhance in in sports that require a large body mass or high energy output. However, the diastolic and systolic rates are hardly affected by the supplementation of creatine.

According to Williams 1999 and Brooks 2000, it is the free ATP, the

immediate energy source, which fuels muscle contraction. Power production in muscle cells is dependent on the cyclic creation of cross bridges. However, in striated muscles power generation depends on the interaction between thin filaments, thick filaments and myosin. During these cycles and interactions, there is a high energy conversion that boosts muscular performance and supplements the high energy needed by athletes during an intensive exercise.

Human muscle also has a high limit to creatine content in muscles. It is thought to be around 158 mmol per kg dry weight. This upper limit can only be exceeded under definite conditions. Harris 1992 found out that TCr content of more than 179 mmol per kg is risky and athletes should not outstrip this dosage since it will increase the demand on the kidneys as it tries to excrete the additional creatine. Overworking the kidney creates a feeling of fatigue which might further hamper the athletes' performance rather than improving it but is not likely to cause kidney malfunction (Harris, 1992).

The research should be refined to determine the exact effects of creatine on resistance training and provide evidence as to whether athletes should be allowed to use it or not. The research should also seek to give a solid explanation behind the effects of creatine and draw a tentative conclusion on the effects of creatine since various researchers seem to give a divergent explanation of the health effects of creatine.

The literature review presented above discusses some of the actions of creatine on the muscle metabolism and exercise performance. From the available research, creatine supplement increases muscle PCr content which increase short period performances. However, not all studies report

ergogenic benefits. Creatine is therefore seen as a safe nutritional strategy that might enhance sports performance for athletes requiring maximal single sprints. Further research should be conducted to gain better understanding of the effects of creatine.

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