

## **Effects of Six Weeks Creatine Supplementation on Bench Press Performance among Junior Male Powerlifters**

**Sunil Lochab\*, Manish Kumar P\*\*, Dr. Madhavi Pathak Pillai\*\*\***

\* President, Powerlifting Federation of India, and National Coach Bodybuilding.

\*\* Head of the Department, Physical Education, S.F.S, Delhi.

\*\*\* Physical Education Teacher, TAFS, Delhi.

(Received 01 April 2017- Accepted & Published 15 April 2017)

### ***Abstract***

The purpose of the study was to find out the effects of six weeks of creatine supplementation with specific training on bench press performance among male Powerlifters. To achieve the purpose ten (10) male power lifters from Delhi state who will going to participate in Delhi state bench press championship 2017 (RAW) held in Delhi organized by Powerlifting federation of India and Delhi Amateur Powerlifting Association were selected for the study. The selected subjects were from junior category. The age of the subjects were ranging between 19 and 23 years. All the subjects were tested on selected criterion variables, i.e., 1 RM bench press test. The data pertaining to the respective performance variable were collected at pre and post stage. The descriptive analysis and 't' test was applied to find out the difference. It was found that six week of creatine supplementation with specific training had improved the performance in creatine group. It was concluded that creatine supplementation can improve the performance of the powerlifters if taken with training under proper supervision.

***Key words: Creatine, Powerlifting, Bench Press, Delhi state.***

### **INTRODUCTION**

Powerlifting is a strength sport that consists of three attempts at maximal weight on three lifts: squat, bench press, and deadlift. As in the sport of Olympic weightlifting, it involves the athlete attempting a maximal weight single lift of a barbell loaded with weight plates. Powerlifting evolved from a sport known as "odd lifts", which followed the same three-attempt format but used a wider variety of events, akin to strongman competition. Eventually odd lifts became standardized to the current three.

The roots of powerlifting are in traditions of strength training stretching back as far as Greek and Roman times. The modern sport originated in the United States and the UK in the 1950s. Previously, the weightlifting governing bodies in both countries had recognized various 'odd lifts' for competition and record purposes. During the 1950s, Olympic weightlifting declined in the United States, while strength sports gained many new followers. In 1958, the AAU's National Weightlifting Committee decided to begin recognizing records for 'odd lifts'. A national championship was tentatively scheduled for 1959, but it never happened. The first genuine national 'meet' was held in September 1964 under the auspices of the York Barbell Company. Ironically, Bob Hoffman, the owner of York Barbell, had been a long-time adversary of the sport. But his company was now making powerlifting equipment to make up for the sales it had lost on Olympic-style equipment.

### **Raw Powerlifting**

Unequipped or "raw" (often styled as RAW) powerlifting has been codified in response to the proliferation and advancement of bench shirts and squat/deadlift suits. The AAU first began its raw division in 1994 and the term "raw" was coined by Al Siegal who later formed the ADAU in 1996. The 100% RAW federation was founded in 1999; within a decade, many established federations came to recognize "raw" divisions in addition to their traditional (open) divisions permitting single-ply or

multi-ply equipment. RAW during this time frame however was looked upon as a beginner's stage by the elite lifters in powerlifting. In January 2008 the Raw Unity Meet (simply known as "RUM") was formed by Eric Talmant and Johnny Vasquez. This contest became the turning point in raw lifting. It was a crucial contest that gathered the best lifters under one roof regardless of gear worn to compete without equipment. Brian Schwab, Amy Weisberger, Beau Moore, Tony Conyers, Arnold Coleman and Dave Ricks were among the first Elite lifters to remove their equipment and compete raw. RUM spearheaded raw lifting into what it has become today. United Powerlifting Association (UPA) established a standard for raw powerlifting in 2008 and USAPL held the first Raw Nationals in the same year. Eventually, IPF recognized raw lifting with the sanction of a "Classic 'Unequipped' World Cup" in 2012, and published its own set of standards for raw lifting. By this time, the popularity of raw lifting has surged to the point where raw lifters came to predominate over equipped lifters in local meets. Note that the IPF's use of the word 'classic' to describe raw powerlifting is differentiated from most other powerlifting federations' use of the word to differentiate between 'classic raw' and 'modern raw': classic raw is still unequipped but allows the use of knee wraps while modern raw allows knee sleeves at most. The IPF does not allow knee wraps in its unequipped competitions and would thus be considered 'modern raw' but the IPF does not recognize the word 'raw.'

The use of knee sleeves in unequipped powerlifting has brought about much debate as to whether certain neoprene knee sleeves can actually assist a lifter during the squat. Some lifters purposely wear knee sleeves which are excessively tight and have been known to use plastic bags and have others to assist them get their knee sleeves on. This led to the IPF mandating that lifters put on their knee sleeves unassisted.

Creatine is one of the most popular and well-researched ergogenic aids available (Naclerio, Allgrove, & Jimenez, 2012; Lawler, Barnes, Wu, Song, & Demaree, 2002). An ergogenic aid is used widely as technique or practice for increasing performance capacity and efficiency to perform work in the new sports world. The ability to recover from exercise, and promoting greater training adaptations resulting high quality of training made this method more popular among the trainers and coaches.

Research showed that increased creatine intake help in increasing creatine and phosphocreatine in muscle concentration. However, that availability of creatine and phosphocreatine significantly contribute to energy metabolism particularly during intense exercise regime. During last few years many studies were conducted based on creatine and phosphocreatine effect and a number of reviews were published in national and international level, all the reviews examining the potential ergogenic effects of creatine supplementation and concluded that creatine supplementation helps to increase muscle total creatine and phosphocreatine concentration. It was also observed that creatine improve performance mainly during short-duration, high intensity exercise performance and very less evidence has been documented proving that creatine supplementation enhanced exercise performance during moderate intensity to high-intensity and specially during prolonged exercise. With this some questions need to be answered that whether all the results documented were observed in laboratory settings and whether the same performance can be transferred on to the playfield and such performance changes would be able to enhance training adaptations among the athletes, and is it safe to go for long-term creatine supplementation.

## METHODOLOGY

10 male power lifters from Delhi state who will going to participate in Delhi state bench press championship 2017 (RAW) organized by Powerlifting Federation of India and Delhi Amateur Powerlifting Association were selected for the study. The selection subjects were from junior category. The age of the subjects were ranging between 19 and 23 years. The selected subjects were named as Creatine Supplementation Group (CG).

All the subjects were given a six weeks common powerlifting training workout and creatine supplementation under supervision of expert. Participants were instructed to avoid changes in their usual level of physical activity and dietary habits during the entire experimental period, which was monitored via a self-report diary. 48 hours prior to each experimental trial, participants were also instructed to refrain from heavy exercise to minimize interference. In addition, participants were educated about creatine-containing food and beverages. Furthermore, any participants previously supplemented with creatine or caffeine stopped at least four weeks prior to the beginning of the study to ensure PCr stores had returned to normal levels after cessation of creatine supplementation and minimizing the caffeine effect on performance. For the purpose of the study the data was collected by 1RM bench press test in the beginning of the experiment (Pre Data without creatine or training) and after the experiment (Post Data with creatine treatment and training).

Participants completed a 1RM strength test for bench press (BP), using free weights and a spotter. To begin the warm up, each participant performed a set of 8-10 repetitions, with a weight that is approximately 50% of the anticipated 1RM. Participants rested for 1-2 minutes, after which a set of 4-6 repetitions was completed with a load of approximately 80% of the predicted 1RM. After a 2-minute rest period, the weight was increased to an estimated 1RM load, and the participants attempted a single repetition with the weight. After the completion of each successful 1RM attempt, the weight was increased 5 to 10% weight until failure was reached. The scores were served as raw data on at T1 (Pre Data) and T2 (Post data). To fulfill the demand of the study, as the experimental design suggests descriptive statistics, T test and percentage method were applied.

## DISCUSSION AND FINDINGS

### i) Intra-group matching (Intra-group comparison)

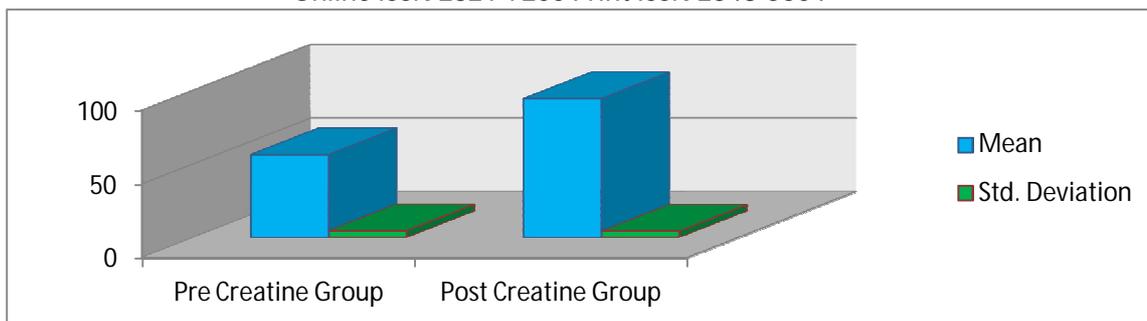
Intra-group matching is the comparison within Creatine supplementation training groups to demonstrate homogeneity and heterogeneity, if any, at pre, and post stage since all the subjects taken from same population for the current study.

Such type of matching or comparison will help the investigator to plan out the net effect of only creatine supplementation and specific training on the subjects. For the analysis the Independent 't' test will be implemented to calculate the significant difference, if any, with the significance criteria of  $\alpha =$  or  $p < 0.05$ .

**Table 1: Mean Scores, Standard Deviation, Std. Error Mean and Resultant 't' Values for 1 RM Bench Press Test at Pre Post Stages for Creatine Group (CG) (N=10 for each group)**

Groups	N	Mean	Std. Deviation	Std. Error Mean	T
Pre Creatine Group	10	56.50	4.74	2.134	<b>-17.804*</b>
Post Creatine Group	10	94.50	4.37		

*\*Significant at  $p \geq 0.05$  level*



**Figure 1: - Mean and Standard Deviation of 1 RM Bench Press at Pre and Post Stage in Creatine Group.**

Table 1 reveal that there was significant difference exists between the mean scores of pre to post creatine group (CG) as the obtained 't' value -17.804 for bench press test of 1RM test which was found to higher than the required table value 2.228 for significant at 0.05 level of confidence with df 9. The mean and the standard deviation Pre creatine group (CG) Post creatine group (CG) was  $56.50 \pm 4.74$  and  $94.50 \pm 4.37$  respectively.

**Table 2: Mean, Maximum and Minimum Percentage Improvement in Weightlifting Performance in 1 RM Bench Press at Post Test for Creatine Supplementation Groups.**

Test	N	Mean%	Maximum%	Minimum%
Creatine Group	10	40.08	50.00	31.58

Table 2 represents the mean, maximum and minimum improvement in weightlifting performance in percentage in 1 RM bench press test in creatine supplementation training group. In case of creatine supplementation training group average mean Improvement, maximum improvement and minimum improvement were 40.08%, 50.00%, and 31.58%, respectively.

On the basis of finding it was analysis that creatine supplementation group had an improved performance capacity. It was clear with the finding that creatine improves the power capacity. Same kind of result were observed by Herda et al. (2009) who examined the effects of 28-days of creatine supplementation (5 g creatine per day) without resistance training on 1RM for leg press and bench press. When compared to the placebo (3.6 g of microcrystalline cellulose per day), subjects taking creatine showed significant increases in both 1RM for bench press (approximately 8% increase) and leg press (approximately 10% increase).

These difference is an clear indicator that creatine had a positive effect on performance capacity and based on result it can be state that creatine supplementation contribute in performance enhancement in power dominating sports like weightlifting. Creatine supplementation lead to enhanced strength gains in bench press, squat, elbow flexion, deadlift, and leg press (Kreider, Ferreira, Wilson, Grinstaff, Plisk, et al., 1997; Cribb & Hayes, 2006; Becque, Lochman, & Melrose, 2000; Herda et al., 2009; Saremi, Gharakhanloo, Sharghi, Gharaati, Larijani, et al., 2010).

#### References

- Astrand, P., and Rodahl, K. Textbook of Work Physiology. McGraw-Hill, Inc., 535-536, 1986.
- Backx EM, "Creatine Loading Does Not Preserve Muscle Mass or Strength During Leg Immobilization in Healthy, Young Males: A Randomized Controlled Trial.", Sports Med. 2017 Jan 5.

- Balsom PD, Söderlund K, and Ekblom B, "Creatine in humans with special reference to creatine supplementation.", *Sports Med.* 1994 Oct;18(4):268-80.
- Cooper R, Naclerio F, Allgrove J, & Jimenez A. (2012). Creatine supplementation with specific view to exercise/sports performance: An update. *Journal of the International Society of Sports Nutrition*, 9(1): 33.
- Lawler, J. M., Barnes, W. S., Wu, G., Song, W., & Demaree, S. (2002). Direct antioxidant properties of creatine. *Biochemical and Biophysical Research Communications*, 290(1), 47-52.
- Casey, A., Constantin-Teodosiu, D., Howell, S., Hultman, E., & Greenhaff, P. L. (1996). Creatine ingestion favourably affects performance and muscle metabolism during maximal exercise in humans. *Am J Physiology Endocrinal Metab*, 271, E31-E37.
- Carr A, "Effect of caffeine supplementation on repeated sprint running performance, *J Sports Med Phys Fitness* 2008 Dec; 48(4):472-8.
- Greenhaff, P. L., et.al, Effect of oral creatine supplementation on skeletal muscle phosphocreatine resynthesis. *American Journal of Physiology*, 266: E725-E730, 1994.
- Lemon, P. F Ascm, et.al, Effect of oral creatine supplementation on energetic during repeated maximal muscle contraction. *Medicine and Science in Sports and Exercise*, 27(5): S204, 1995.
- Lemon, W. R. (2002). Dietary creatine supplementation and exercise performance: why the inconsistent results? *Canadian Journal of Applied Physiology*, 27(6), 663-680.
- Mujika I and Padilla S, "Creatine supplementation as an ergogenic aid for sports performance in highly trained athletes: a critical review", *Int J Sports Med.* 1997 Oct;18(7):491-6
- Thomas L. Andre, "Effects of Five Weeks of Resistance Training and Relatively-Dosed Creatine Monohydrate Supplementation on Body Composition and Muscle Strength, and Whole-Body Creatine Metabolism in Resistance-Trained Males", *International Journal of Kinesiology & Sports Science*, Vol. 4 No. 2; April 2016
- Williams, M. H. B., D.J. (1998). Creatine supplementation and exercise performance: an update. *Journal of the American College of Nutrition*, 17(3), 216-234.
- Willoughby, D. S. R., J. (2001). Effects of oral creatine and resistance training on myosin heavy chain expression. *Medicine and Science in Sports and Exercise*, 33(10), 1674-1681.
- [https://en.wikipedia.org/wiki/Olympic\\_weightlifting](https://en.wikipedia.org/wiki/Olympic_weightlifting).
- <https://en.wikipedia.org/wiki/Powerlifting>
- "100% Raw Powerlifting Federation". *Powerlifting Watch*. Retrieved 2014-02-22.
- "2008 Raw Nationals - USA Powerlifting". *UsaplNationals.com*. Retrieved 2014-02-22.
- Jump up^ [http://www.powerlifting-ipf.com/fileadmin/data/Championships/IPF\\_CLASSIC-Rules.pdf](http://www.powerlifting-ipf.com/fileadmin/data/Championships/IPF_CLASSIC-Rules.pdf)
- Jump up^ [http://startingstrength.com/articles/powerlifting\\_resurrection\\_gallagher.pdf](http://startingstrength.com/articles/powerlifting_resurrection_gallagher.pdf)
- Jump up^ [http://www.usapowerlifting.com/ngb/2012/2012\\_NGB\\_Minutes.pdf](http://www.usapowerlifting.com/ngb/2012/2012_NGB_Minutes.pdf)
- Jump up^ "Powerlifting Knee Sleeves". *Powerlifting ToWin*.