Academic Sports Scholars
Vol -1 , ISSUE –11, Nov.2012
ISSN:- 2277-3665 **Available online at www.lbp.world**

ORIGINAL ARTICLE

EFFECT OF PLYOMETRIC TRAINING PROGRAM ON ANTHROPOMETRIC AND BIOCHEMICAL VARIABLES OF UNIVERSITY HANDBALL PLAYERS

Kalpana Garikar
Babasaheb University.

ABSTRACT

Dynamic: The motivation behind this investigation was impact of formed plyometric preparing program on anthropometric and biochemical factors of college Handball players was pointed in their typical preparing period. The plyometric preparing program was connected amid multi week time frame. An aggregate of 10 male Handball players consistently playing focused Handball volunteered for this investigation. All subjects partook in following tests: standing long bounce, profundity jump long hop, prescription ball hurls in 10 seconds; medication ball overhead tosses forward against the divider in 10 seconds, maximal vertical hops to the maximal tallness in 10 seconds, maximal vertical hop stature. Chosen factors were estimated at zero dimension (benchmark information, BD) and toward the finish of preparing A noteworthy increment ($P<0.05$) in back and hold quality, serum urea and high thickness lipoprotein-cholesterol (HDL-C) was seen in the wake of preparing. Then again, a critical decline ($P<0.05$) in muscle to fat ratio, hemoglobin, triglyceride and low thickness lipoprotein-cholesterol (LDL-C) was noted after the finish of preparing. In any case, no noteworthy change was accounted for in fit weight (LBM), uric corrosive and aggregate cholesterol dimension of the players following the preparation. The preparation program is powerful to enhance chosen anthropometric and biochemical parameters for handball.

KEY WORDS BODY FAT, STRENGTH, LIPID PROFILE, LEAN BODY MASS (LBM), TOTAL CHOLESTEROL.

INTRODUCTION

Current handball requires for player a decent physical continuance, parallel it is critical to create speed and touchy power and power perseverance. Handball is additionally a social amusement, where by the great coordination and intelligence comes up to the vital place cooperative individuals great rapprochement and participation (Järvekülg, 2002).

Handball is exceptionally well known diversion worldwide and there is a need of abnormal state of physical and physiological wellness to partake at the first class level. Preparing can enhance the execution of the players to accomplish the most ideal execution. The preparation must be defined by the standards of periodization. The preparation actuated changes saw in different anthropometric and biochemical factors can be credited to fitting burden elements. Constitution and body piece have an imperative job for playing Handball. The first class Handball players need to keep up an ideal dimension of hemoglobin to advance execution. Pulse reaction amid exercise and recuperation can be exceptionally helpful parameters in checking preparing. Handball includes continued bouncing, blocking, yelling, control tossing, and filtering which require an abnormal state of solidarity and power. Also, the serum dimension of urea and uric corrosive might be utilized as

shows of over preparing. What's more, normal checking of lipid profile of Handball players can give profitable data about their wellbeing, metabolic and cardiovascular status.

This investigation was centered around the Handball players as the amusement is well known and played all through the world. Concentrates watching the impact of preparing on anthropometric and biochemical factors of expert Handball players are inadequate in India. In perspective of the over, an examination was embraced to explore the impact preparing on anthropometric and biochemical factors of college Handball players.

MATERIAL AND METHODS

Subjects and Training

An aggregate of 10 male University of Rajasthan, Jaipur Handball frequently playing focused Handball (playing for last 4-7 years) volunteered for this investigation.

Plyometric preparing should advance slowly from lower power to higher force drills, particularly for people who do not have a critical quality preparing foundation.

Profundity bounces have an incredible preparing impact so the volume of work ought to be low, close to 4 sets of 10 reiterations, 2-3 times each week for cutting edge competitors and 3 sets of 5-8 redundancies, 1-2 times each week for lower classes of competitors (Baggett, 1995). An a multi day rest (48 hour least) between sessions will permit full recuperation of the musculoskeletal framework and further improve adjustment. The quantity of reiterations and sets fluctuate contingent on the power of the bore. When in doubt, a low power practice requires more reiterations. An activity with a higher level of trouble requires less reiterations (Brittenham, 1995).

The sample of subjects

The plyometric preparing program was connected amid multi week time frame where was gone to ten University of Rajasthan, Jaipur college handball players. Their mean (±SD1) age, tallness and mass were 15.5 ± 2.03 years, 173.9 ± 9.7 cm and 65.3 ± 10.34 kg, individually (the players qualities are given in Table 2). They all had four useful trainings and two exercise center exercise trainings sessions seven days, and the sessions endured 60 to a hour and a half. The instructional courses were pursued 3 days/week, as indicated by the necessity of the amusement and aggressive interest in the wake of heating up, the resting time frame between activities arrangement was one moment.

The preparation plan, sort of preparing, volume and force is appeared Table 1. The preparation program, tests and estimations were led by the standard systems, having built up dependability and legitimacy, embraced by different specialists. Subsequently the preparation program, tests and estimations utilized were legitimate. The chose anthropometric and biochemical factors were estimated in the research center toward the start of the preparation (pattern information, BD) and toward the finish of preparing Phase. Each test was booked in the meantime of day (± 60 minutes) so as to limit the impact of diurnal variety. The subjects were educated about the conceivable difficulties of the investigation and gave their assent.

General training schedule for the University handball players.

Procedures

The players had six trainings for each week, and three of them had included plyometric preparing. Preparing span was a hour and a half. Preceding each instructional course, all subjects took an interest in a 10 minute warm-up period which included running at a self-chose agreeable pace pursued by exercises. Subsequent to heating up session players performed plyometric preparing and in the wake of completing begins with their standard preparing. All competitors have directions how to make practices accurately before beginning plyometric program.

Testing procedures

All players took part in three control testing. First estimating was previously plyometric instructional course in July 2013(Base Line information BD). Second testing was following a month plyometric preparing streak in August 2013(pre preparing program information PT) and last control estimating has taken four months after first testing in October 2013(after preparing program AT)

1. Standing long hop.
2. Depth jump long hop.
3. Medicine ball hurls in 10 seconds.
4. Medicine ball overhead tosses forward against the divider in 10 seconds.
5. Maximal vertical bounces to the maximal tallness in 10 seconds.
6. Maximal vertical hop tallness..

Measurement of Back and grip Strength

The back and hold dynamometers (Senoh, Japan) were utilized to record the quality of the back and grasp muscles following a standard technique (Jonson and Nelson, 1996). For estimations of back quality, one hand of the subject held over and the other under the bar. The hands were spread to the width of shoulders. The storage compartment was flexed just marginally forward (10°-15°) at the hip joints. The body weight was adjusted on the feet, which were set around 15 cm separated. The knees were kept straight all through the lift. The lift was performed consistently upwards, without yanking. The subjects were not permitted to lean in reverse on the heels. It was guaranteed that the back was directly toward the finish of the lift. For estimation of hold quality the dryness of the hand and the instrument were guaranteed. The analyzer set the pointer to zero and put the dynamometer in the subject's hand, with the dial against the palm and the bigger (curved) squeezing edge in the "heel" of the palm. The afterure and situating of the subjects tried were as indicated by the standard technique (Jonson and Nelson, 1996). The information was acquired with the elbow at 90° flexion, bear at 0° flexion and wrist somewhere in the range of 0° and 15° of ulnar and spiral deviation. The subject crushed strongly and relentlessly however much as could be expected, verifying that no piece of the arm contacted the body. For both back and grasp quality test three preliminaries were permitted with an interim of two minutes. The test was rehashed on the off chance that some other deviation from legitimate method was noted. The most noteworthy perusing of the three preliminaries was recorded in kilograms.

Measurement of Biochemical Variables

A 5 ml of venous blood was drawn from an antecubital vein after a 12 hrs quick and 24 hrs after the last episode of activity for ensuing assurance of hemoglobin (Hb), serum urea, serum uric corrosive, add up to cholesterol (TC), triglycerol (TG), high thickness lipoprotein-cholesterol (HDL-C) and low thickness lipoprotein-cholesterol (LDL-C). Hemoglobin was estimated utilizing Cyanmethaemoglobin strategy (Mukharjee, 1997). Serum urea (Wybenga et al., 1971) and uric corrosive (Martinek, 1970) were resolved calorimetrically utilizing standard technique. Serum triglycerol (Schettler and Nussei, 1975), serum add up to cholesterol (Wybenga, et al., 1970) and HDL-C (Wybenga, et al., 1970) were dictated by enzymatic technique. LDL-C was by implication evaluated following standard condition (Friedewald et al., 1972).

Statistical analysis

Every one of the estimations of anthropometric and biochemical factors were communicated as mean and standard deviation (SD). One Way Analysis of Variance (ANOVA) trailed by different examination tests was performed, to discover the noteworthy distinction in chose

anthropometric and biochemical factors estimated when the preparation. For each situation the noteworthy dimension was picked at 0.05 dimensions. In like manner, a measurable programming bundle (SPSS) was utilized.

RESULTS

Effect of training on body fat and LBM of Indian University handball players

A critical (P<0.05) decrease in percent muscle versus fat was noted among the Handball players when contrasting standard information and that of the pre preparing period and subsequent to preparing period. Nonetheless, when looking at muscle versus fat of pre preparing period with that of the pre preparing period no noteworthy change was noted among the players. Further, no critical distinction was seen in weight and LBM of the Handball players after the preparation program

Note. Information exhibited as mean ± SD; n=10; Computed utilizing alpha = 0.05; * when contrasted with BD, BD= gauge information, PT= pre preparing, AP= After Training, NS= not noteworthy; LBM= slender weight Effect of preparing on biochemical factors of University handball players

A noteworthy decrease (P<0.05) in hemoglobin level was noted in pre preparing and in the wake of preparing when contrasted with gauge information of the Handball players. When contrasting hemoglobin dimension of pre preparing and that of the in the wake of preparing no huge change was noted among the players. Despite what might be expected, critical increment (P<0.05) in serum urea level was noted in pre preparing and subsequent to preparing when contrasted with gauge information of the Handball players. Looking at serum urea dimension of pre preparing with the in the wake of preparing stage no noteworthy change was noted among the players. Further, a critical increment (P<0.05) in HDL-C level was noted in pre preparing and in the wake of preparing when contrasted with pattern information of the Handball players. When looking at HDL-C dimension of pre preparing with that of the after stage no noteworthy change was noted among the players. Then again, huge decrease (P<0.05) in triglyceride and LDL-C levels was noted in the after stage when contrasted with gauge information of the Handball players. Be that as it may, when contrasting pattern information and pre preparing no critical change was noted in triglyceride and LDL-C levels. Also, no noteworthy change was noted in serum uric corrosive and aggregate cholesterol dimensions of the players after the preparation

DISCUSSION

Tip top Handball players, with regards to numerous other tip top competitors, will in general be lean and strong (Lidor and Ziv, 2010; Portal et al., 2010; Sheppard et al., 2009). In the present examination, a noteworthy (P<0.05) decrease in percent muscle to fat ratio was noted among the Handball players when contrasting gauge information and that of the preliminary and in the wake of preparing programs. The decrease in muscle versus fat may be because of the way that the sportsmen experienced high power and volume of preparing over some undefined time frame, which brought about bringing down of muscle to fat ratio. The conceivable reason of decrease of muscle to fat ratio was aerobic exercise which expanded more prominent use of fat for enthusiastic (Carbuhn et al., 2010; Malousaris et al., 2008). Consequently, it very well may be expressed that Handball players can lose muscle versus fat all the more amid pre trainingand in the wake of preparing system of preparing. This may be because of escalated preparing and rivalry plan. When the season, amid the interim most players have their fat substance expanded, probably attributable to diminished vigorous movement alongside dietary and conduct changes (Carbuhn et al., 2010; González-Ravé et al., 2011). Comparable discoveries were accounted for by different scientists (Carbuhn et al., 2010; González-Ravé et al., 2011). Then again, no noteworthy contrast was seen in

weight and LBM of the Handball players after the preparation program. This may be because of ill-advised improvement of the preparation stack or potentially brief length of the preparation. It has been accounted for that brief length of preparing has no critical impact of weight and LBM (Reilly, 1990) . Since Handball players, even at the most elevated amounts, will in general have warehouses of muscle to fat ratio higher than ideal, it appears to be levelheaded to exhort the Handball players to keep their movement profile moderately high particularly amid the off-season with the expect to remain fit and to forestall expanded body adiposity.

In the present examination, a huge decrease ($P<0.05$) in hemoglobin level was noted in preliminary and subsequent to preparing programs when contrasted with gauge information of the Handball players. This may be because of the impact of preparing. The preparation stack was step by step expanded from standard to the pre preparing accordingly, decrease in hemoglobin level was seen in this stage. Further, amid the in the wake of preparing program, preparing load alongside the worry of rivalry was in charge of the declined in hemoglobin level. It very well may be recommended that the decrease in hemoglobin level may be because of haemolysis (Fujitsuka et al., 2005). What's more, practice preparing actuated decrease in hemoglobin fixation additionally may be because of hemodilution which is a typical physiological impact of aerobic exercise likewise exist among the very much prepared competitors because of expanded in plasma volume (Neumayr et al., 2005). Comparative perceptions were accounted for by numerous scientists. Concentrates on expert competitors demonstrated that hemoglobin esteems were higher toward the start of the challenge season, and afterward declined in all around prepared competitors (Ostojic and Ahmetovic, 2008; Radjen et al., 2011).

Quality is the focal segment of a Handball preparing program (Marques et al., 2008, 2009; Sheppard et al., 2009). As vertical bouncing and fast developments are a piece of the amusement, along these lines, quality is fundamental for match play (Kasbalis et al., 2005; Marques et al., 2008; Popadic Gacesa et al., 2009). A noteworthy ($P<0.05$) increment in back quality and grasp quality of right hand (GSR) were noted among the Handball players when contrasting the pattern information and that of the preliminary and in the wake of preparing programs. Likewise, huge increment ($P<0.05$) in grasp quality of left hand (GSL) was noted among the Handball players when contrasting the gauge information and that of the subsequent to preparing programs. This may be because of the impact of preparing. The adjustments in volume and force of preparing modules have demonstrated critical enhancement in anaerobic power and quality of the players. Amid pre preparing the volume of preparing was high, and an expansion in quality and power preparing boost may be the purpose for the enhancement in quality in the wake of preparing. Comparative discoveries were noted by numerous specialists (Kasabalis et al., 2005; Häkkinen, 1993; Marques et al., 2008; Newton et al., 2006). It has been seen that the utilization of the preparation programs utilizing quality and power activities would be especially successful in enhancing execution (Burnham et al., 2010; Gabbett, 2008).

The serum urea and uric corrosive dimension has been considered as a marker of overtraining and protein catabolism (Kargotich et al., 2007; Urhausen and Kindermann, 2002) . In this investigation, noteworthy increment ($P<0.05$) in serum urea level was noted in preliminary and in the wake of preparing programs when contrasted with standard information of the Handball players. The largest amount of urea was noted in the subsequent to preparing program when the preparation load and worry of rivalry was most elevated. The conceivable purpose behind the expanded urea level may be because of increment in preparing improvement and increment breakdown of proteins. It is trusted that an articulated increment in the urea focus shows solid impact of an instructional course, while standardization of the urea level in blood is a record of time to perform consequent strenuous instructional meetings (Urhausen and Kindermann, 2002). Comparable perceptions have been accounted for by numerous specialists (Kargotich et al., 2007;

Neumayr et al., 2005) . Be that as it may, no huge change was noted in serum uric corrosive dimensions of the players after the preparation. This may be because of inappropriate improvement of the preparation stack.

Lipids and lipoprotein profile demonstrate the cardiovascular and the metabolic status of the competitor (Kelley and Kelley, 2009; Popichev et al., 1997). In the present examination, a huge increment (P<0.05) in HDL-C level was noted in preliminary and subsequent to preparing programs when contrasted with standard information of the Handball players. Then again, noteworthy decrease (P<0.05) in triglyceride and LDL-C levels were noted in the in the wake of preparing program when contrasted with gauge information of the Handball players. As the preparation load and worry of rivalry expanded from pre-preparing period to pre trainingand in the wake of preparing program, the dimension of triglyceride and LDL-C were diminished where as the dimension of HDL-C expanded bit by bit. These progressions may be because of preparing. The conceivable explanation behind the decrease in triglyceride and LDL-C; and height in HDL-C was that activity particularly, perseverance practice which expanded digestion and use of blood lipids and lipoprotein for vitality generation (Altena et al., 2006; Kelley and Kelley, 2009; Popichev et al., 1997). Notwithstanding, no critical change was noted in all out cholesterol dimension of the players after the preparation program. This may be because of ill-advised streamlining of the preparation stack. Our discoveries are in congruity with the perceptions of different specialists in their ongoing examinations. Cross-sectional examinations likewise detailed an expansion in HDL-C level and decline in triglyceride level after exercise (Kelley and Kelley, 2009). An ongoing report demonstrated huge increment in HDL-C level and decline in LDL-C level, with no adjustment in triglyceride following 9 weeks of preparing (Degoutte et al., 2006). Another examination announced that a month of vigorous exercise preparing fundamentally diminished the dimensions of aggregate cholesterol, LDL-C, and expanded HDL-C (Altena et al., 2006).

CONCLUSIONS

These progressions are because of preparing and also because of taking an interest in an expanding number of rivalries. An explicit Handball preparing program with the structure and loads depicted in this examination is successful of enhancing body sythesis and quality parameters. The preparation actuated changes in anthropometric

ACKNOWLEDGEMENT

The creator earnestly and wholeheartedly recognizes the commitment of Indian Handball players, the Handball mentors and the partners in the lab, without whose assistance the present investigation would have been exceptionally hard to complete.

REFERENCES

Md.[clarification needed] Ariful, Islam; Md.[clarification needed], Asadujjaman; Md.[clarification needed], Nuruzzaman; Md.[clarification needed] Mosharraf, Hossain. "Ergonomics Consideration for Hospital Bed Design: A Case Study in Bangladesh". Journal of Modern Science and Technology 01 (01): 30-44.

Ganong, William F. (Lange Medical, 2001) Review of Medical Physiology (pp. 392-397)

Gill, Simeon; Parker, Christopher J. (2014). "The True Height of the Waist: Explorations of Automated Body Scanner Waist Definitions of the TC2 scanner". Proc. of 5th Int. Conf. on 3D Body Scanning Technologies: 55–65. doi:10.15221/14.055. Retrieved 1 May 2018.

Shortest man world record: It's official! Chandra Bahadur Dangi is smallest adult of all time Guinness World Records

"Tallest Man". Guinness World Records. March 19, 2010. Archived from the original on March 19,

2010. Retrieved 2010-03-19. at Wayback machine

Chivers, Tom (2009-09-24). "Human extremes: the tallest, shortest, heaviest and lightest people ever". The Telegraph. Retrieved 2013-05-26.

Quilty-Harper, Conrad; Andrew Blenkinsop; David Kinross; Dan Palmer (2012-06-21). "The world's fattest countries: how do you compare?". The Telegraph. Retrieved 2013-05-26.

Cosgrove, KP; Mazure CM; Staley JK (2007). "Evolving Knowledge of Sex Differences in Brain Structure, Function and Chemistry". Biol Psychiatry. 62 (8): 847–55. doi:10.1016/j.biopsych.2007.03.001. PMC 2711771. PMID 17544382.

Allen, JS; Damasio H; Grabowski TJ (2002). "Normal neuroanatomical variation in the human brain: An MRI-volumetric study". Am J Phys Anthropol. 118 (4): 341–58. doi:10.1002/ajpa.10092. PMID 12124914.

Cox, Alvin J. (1945). "Variations in size of the human stomach" (PDF). California and Western Medicine. 63 (6): 267–268. PMC 1473711. PMID 18747178. Retrieved 2013-05-26.