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Designing and testing basic protocol for medium fast bowler to increase the speed and accuracy

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***Abstract*---**Background: The skill of medium fast bowlers to consistently maintain their pace and accuracy while bowling , help them to not allow batsman to settle in their inning, and benefit to bowlers to take their wickets. In field of cricket the various parameters like bowling speed and accuracy have been a major area of research. Aim. To study the effect of designed and tested basic protocol on medium fast bowlers speed and accuracy. To study the Kinematic measures in the first four overs of medium fast bowling. To study the effect of a designed based training on, 6RM Squat Test , 6 RM Bench Press Test and Yo-Yo Intermittent Recovery Test Level 1 (YYIRTL1) . Material and Methods: 60 State Level Male Medium Fast Cricket Bowlers (mean age under 19 boys) were divided into two group one group will going to do subject specific protocol based training for 6 weeks and another will be an control group. Before and before after 6 weeks all subject were going to perform 6RM Squat test, 6 RM Bench Press test , Yo-Yo Intermittent Recovery Test- Level 1 (YYIRTL1), Kinematic Analysis ,bowling speed and bowling accuracy testing by Sports Motion Pro Trainer DV Version 2010 , Doppler Radar Gun and the target zone . Result: The finding of this study shows that the designed and tested basic protocol for improving the speed of Saurashtra region medium fast bowlers is statistically significant as well as shows significant improvement ($p < 0.05$) in Front Foot Contact , 6 RM Squat Test , 6 RM Bench Press Test and Yo-Yo Intermittent Recovery Test Level 1 . Conclusion: Study shows the use of basic protocol training program is improving the bowling speed of medium fast bowlers and having non -significant effect on bowling accuracy

Keywords---cricket, bowling speed, bowling accuracy, training program.

Introduction

Cricketers usually , medium fast bowler who playing as batting all-rounder use their bowling accuracy, speed, and consistency for taking advantage on batsman by increasing their pace , so that the batsman get less time to react , judge and play their shots. [1] Penrose et al had found that a ball delivered at 44.4 millisecond reached the batsman in approximately 0.44 second.[2,9] It had been found that if pace bowlers are consistent in their speed for longer duration (consistency), then batsmen find it difficulty and getting less time to react after the delivery of ball due to decrease in their reaction time. The demand of the game (cricket) focusing on medium fast bowlers to bowl speedily. Moreover, they have to additionally focus on bowling accuracy, because opponent team can use the inaccurate bowls delivered by bowler to converting into runs. In addition to it skills like maintaining accuracy in bowling with proper line and length in match make it's more difficult for the batsmen to play freely and convert those deliveries into runs. With the different skills of medium fast bowlers to remain accurate in their accuracy throughout the match consistently in their bowling spell is crucial and helping them for creating pressure on opponent player and not allowing them to score runs in their innings by taking wickets.[3,8]

It has been proven and stated by Karppinen et al, [4] that the fundamental concept behind plyometric training is the stretch shortening cycle of muscle , while implementing properly, it will generate maximum power output in minimum amount of duration. In baseball players 6 Ballistic plyometric designed exercises had been given and found that it improve the effectiveness of throwing pace. Moreover, it enhance the rotator cuff muscle group strength which is vital for preventing the shoulder girdle injuries due to repeated overhead throwing by baseball players. The plyometric training like ballistic 6 consist of 6 plyometric exercises for upper extremity which require quick, powerful and effective movements for activating the stretch shortening cycle. [4, 5]

Plyometric includes 3 phases Firstly, Landing phase that includes eccentric contraction of muscles results in stretch reflex leads to a more powerful concentric contraction of muscles. Secondly, Transition phase, is the amount of time between the eccentric muscle contraction and the initiation of a concentric force. In Last, Take off Phase where athlete prepare himself for the movement as well as for the next repetition of the movement . Plyometric drills enhances concentric contraction which is proved by Pretz et al.[6,]

In last few years cricket is developed so much that every country are creating infrastructure and taking participation in big events of cricket tournament. The popularity and diversity of cricket is keep increasing globally. The game of cricket had history of more than 400 years, but still there was no standardized test that had been designed and tested for measuring skills like accuracy of medium fast bowlers .[7]

In the sports of cricket, bowler delivers the ball towards stump which is safeguard ,stop and secured by opponent team batsmen. Cricketer who bowl 75 to 80 mph with proper skilled in bowling is called medium fast bowler. The quantitative guidelines and readings regarding cricketers abilities had never been documented even in the literature of sports science and physical educations. Moreover, the whole analysis, capability of player is judged by parameter which is totally subjective, comparative with the opponent players [8,10].

Methodology

60 male district and state level medium fast bowler cricketers age under 19 years had been selected for the study. All medium fast bowlers are trained and playing under Saurashtra Cricket Association, Rajkot. Randomly, cricketers were assigned into 2 groups by coach , In first group there was 30 medium fast bowlers who underwent designed and tested basic training program called experimental group (n = 30). While second group there was same 30 cricketers underwent regular cricketing activities called control group (n = 30). The experimental group performed strength and conditioning exercises, 3 days per week for one and half month that is 6 weeks. Cricketers who had given concert for training session in experimental group had followed a proper moderate intensity of 10 min warm up under guidance of strength and conditioning coach before intervention.

Cricketers had been assessed before and after a 6-week designed training program for Delivery Stride length , Front Foot Contact , Front Foot Release , Bowling speed, Bowling accuracy , 6 RM Squat Test , 6RM Bench Press Test and YYIRTL1 Test the values had been taken for statistical analysis by SPSS version 20 for Microsoft Windows. The designed training program was defined both in Tables a and b. The designed and tested training protocol includes 6 six different exercises, in which two was resistance training exercises and one core, one conditioning and two plyometric exercises. The resistance exercises were front squat, hip thrust and plyometric exercises consist throwing of medicine ball and jump on box. Core exercises include plank and conditioning had been 40 m sprint. Initially in the first three weeks, the intensity of resistance exercises was 55% of 1 repetition maximum. Every exercises performed by resistance includes 3 sets of 10 repetitions while performing in plyometric exercises intensity was players own body weight and 3 kg medicine ball for 3 set of 10 repetitions. Between Four to Six weeks of training program, the resistance exercises was performed three set of ten repetition with the intensity of resistance exercises was 60 % of 1 RM and plyometric exercised had been implemented with same. One minute of rest between the every sets of exercises.

Table A : Designed Strength & Conditioning program for 1-3 weeks

EXERCISE	SET	REPETITION	WEIGHT
Front Squat	3	10	55 % of 1 RM
Hip Thrust	3	10	55 % of 1 RM
Box Jump	3	10	Body Weight
Rotation Medicine ball throw	3	10	3 Kg
40 m Sprint	3	10	Body Weight

Plank	3	10	Body Weight

Table B : Designed Strength and Conditioning program for 4-6 weeks

EXERCISE	SET	REPETITION	WEIGHT
Front Squat	3	10	60 % of 1 RM
Hip Thrust	3	10	60 % of 1 RM
Box Jump	3	10	Body Weight
Rotation Medicine ball throw	3	10	3 Kg
40 m Sprint	3	10	Body Weight
Plank	3	10	Body Weight

Results

Table C : The results of Delivery Stride Length, Front Foot Contact, Front Foot Release, Bowling Speed , Bowling Accuracy , 6RM Squat Test, 6 RM Bench Press Test and YYIRTL1 pre and post strength and conditioning training program in control and experimental groups

PARAMETER	EXPERIMENTAL PRE	EXPERIMENTAL POST	CONTROL PRE	CONTROL POST
Delivery Step Length	1.10	1.11	1.05	1.06
Front Foot Contact	161.86	162.66	157.03	157.03
Front Foot Release	170.53	171.26	164.73	164.60
Bowling Speed	123.50	126.76	121.30	125.53
Bowling Accuracy	55.36	55.60	56.50	55.63
6 RM Squat Test	28.13	35.10	28.60	29.23
6 RM Bench Press Test	46.00	51.96	40.73	41.26
Yo-Yo Intermittent recovery level -1	15.75	15.98	15.67	15.68

Discussion

The research strongly believes that strength and conditioning training program shows significantly improvement in performance of bowling speed ($p < 0.005$) , 6 RM Squat Test ($p<0.005$) , 6 RM Bench Press Test ($p<0.005$) and Yo-Yo Intermittent recovery level 1 ($p <0.005$). In another words, we can conclude that training of this type had shown improvement in the parameters like plyometric ,core, strength and conditioning of players. Improvement in strength is usually demanded and requirement of Medium fast bowlers .Accurately designed and supervised resistance training program had load monitoring with no extra load on medium fast bowlers. This is an vital part of strength and conditioning which assist in the performance enhancement of medium fast bowlers .

The key findings from this study was that there is significant improvement in the parameters like bowling speed and yo-yo intermittent recovery level 1, which proved that the efficacy of the basic training program of strength and conditioning

consist of resistance training, conditioning and plyometric training. The assessed variables in experimental groups were improved pre to post testing.

Conclusion

tudy shows the use of basic protocol training program is improving the bowling speed of medium fast bowlers and having non -significant effect on bowling accuracy. It shows even in improvement in bowling speed there is no changes in bowling accuracy and due to improvement in physical component in fitness because of tailor made basic designed protocol there is significant ($p<0.005$) improvement in Front Foot contact , bowling speed , 6 RM squat test, 6 RM bench press and Yo-Yo intermittent level recovery level 1 test (YYIRTL1) in U19 Medium fast bowlers.

Statements

Saurashtra Cricket Association provided the set up for the study. Dr Priyanshu Rathod planned, guided the study and Avinash Kumar Boyat conducted the study.

Funding

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Competing Interests
There was no conflict of interests

References

1. Williams LRT. Anticipation and Timing in Motor Skills. New Zealand Journal of Health, Physical Education and Recreation. 1973;6(2):49-51.
2. Penrose T , Foster D . Release velocities of fast bowlers during a crickettest match. Australian Journal for Health, Physical Education and Recreation.1976;71(suppl):2-5.
3. Lillee D, Brayshaw I. The Art of Fast Bowling: William Collins; 1978.
4. Pretz R .Ballistic six plyometric training for the overhead throwing athlete. National Strength and Conditioning Association 2004;26:62-6.
5. Karppinen S .Strength training for fast bowlers: Resistance to resistance training. Conference of Science, Medicine and Coaching in Cricket. Center of Excellence, Cricket Australia 2010. p. 86-9.
6. Syed Tariq Murtaza .Construction and Standardization of fielding Test in Cricket. Published in Indian Streams Research Journal ,2014, Vol. 4, Issue 8/September, ISSN: 2230-7850 .
7. Richard Aldworth Stretch. Validity and reliability of an objective test of cricket skills. Unpublished Thesis submitted in fulfillment of the requirements for the master of arts degree department of human movement studies and physical education, Rhodes University, Grahamstown, South Africa 1984.
8. Ferdinands R, Marshall RN, Kersting U. Centre of mass kinematics of fast

bowling in cricket. Sports Biomechanics. 2010;9(3):139-52.
9. Loram, L. C , McKinon W, Wormgoor S . Determinants of ball release speed in school boy fast medium bowlers in cricket. *Journal of Sports Medicine and Physical Fitness.* 2005:*45*, 483–490.
10. Ferdinands, RE, Marshall RN, Round H . Ball speed generation by fast bowlers in cricket. In International Society of Biomechanics XIXth Congress:The Human Body in Motion [CD- ROM]. Dunedin, New Zealand: University of Otago 2003