

Comparison of Selected Biomotor Fitness Components between Ball and Racket Game Players of Manipur

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Abstract

The present study aimed to compare selected biomotor variables between racket game players and ball game players of Manipur. A total of 60 male athletes aged between 18 and 21 years, who had represented Manipur in state and/or national-level competitions, were selected randomly for the study. The subjects were equally divided into two groups: 30 racket game players (badminton, table tennis, and lawn tennis) and 30 ball game players (football, basketball, and volleyball). The selected biomotor variables were assessed through standard tests, namely the 50 metres Sprint test for speed, SEMO Agility test for agility, the Standing Broad Jump Test for explosive power, and the Harvard Step Test for cardiovascular endurance. The collected data were analysed using an independent t-test with the level of significance set at 0.05. The findings revealed significant differences between the two groups in all selected variables. Ball game players demonstrated superior performance in speed ($t = 3.078$, $p < 0.05$), explosive power ($t = 3.26$, $p < 0.05$), and cardiovascular endurance ($t = 2.73$, $p < 0.05$), whereas racket game players performed better in agility ($t = 9.42$, $p < 0.05$). The study concluded that the nature and physical demands of the respective sports significantly influence the development of bio motor abilities among athletes. The findings may help coaches and trainers design sport-specific training programmes for enhancing athletic performance.

Keywords: Ball Game, Racket Game, Biomotor, Speed, Agility, Explosive Power and Cardiovascular Endurance

Introduction

Physical fitness and motor performance are essential components in the field of sports and games. Athletic success largely depends upon the development of various biomotor abilities such as strength, speed, endurance, agility, flexibility, balance, coordination, and power. These biomotor variables influence the performance capacity of athletes and help them execute sport-specific skills effectively. Biomotor abilities are the basic motor qualities required for high-level sports performance and can be improved through systematic training. Different sports demand different combinations of biomotor abilities. Racket games such as badminton, table tennis, lawn tennis, and squash require quick reflexes, agility, coordination, reaction ability, and speed due to the rapid movement of the shuttlecock or ball and continuous directional changes during play. On the other hand, ball games such as football, basketball, volleyball, and handball demand muscular endurance, explosive power, speed, and overall stamina because of continuous running,

jumping, passing, and tactical movement patterns. According to Matveyev, the nature of a sport determines the specific physical and physiological demands placed upon athletes.

The state of Manipur is widely recognized as one of the leading sports-producing regions in India. The people of Manipur have a rich sporting culture and actively participate in various indigenous and modern games. Over the years, Manipuri athletes have excelled in national and international competitions in both racket and ball games. Due to regular participation and specialized training, athletes develop sport-specific biomotor characteristics that distinguish players of one sport from another. A comparative analysis of biomotor variables between racket and ball players is therefore important to understand the physical fitness profiles associated with each category of sport. Such studies help coaches, trainers, and physical educators identify the strengths and weaknesses of athletes and formulate scientific training programmes for performance enhancement. TC Meran Charanga conducted studies related to sports performance and physical fitness among Manipuri athletes, highlighting the importance of biomotor abilities in achieving excellence in sports. Several researchers have emphasized the role of biomotor components in sports performance. TC Meran Charanga reported that agility, speed, and coordination are highly developed among racket sport players, whereas endurance and muscular power are more prominent in ball game players. Similarly, Bompal stated that scientific training based on sport-specific biomotor requirements enhances athletic performance and reduces the risk of injury. The present study entitled “Comparative Study of Selected Biomotor Variables Between Racket and Ball Players of Manipur” has been undertaken to compare and analyse the selected biomotor variables of athletes belonging to these two categories of sports. The findings of the study may contribute to better understanding of physical fitness requirements and help in designing effective training programmes for athletes in Manipur.

Methodology

For the purpose of this study, a total of 60 subjects were selected from racket and ball game players of Manipur, within the age group of 18 to 21 years, those who had represented state and/or national-level championships from Manipur. An equal number of subjects were taken from each category, with 30 players from racket games (Badminton, table tennis and lawn tennis) and 30 players from ball games (football, basketball and volleyball). The subjects were selected using a random sampling method to ensure fairness and reduce bias in the selection process. The following selected biomotor fitness components were used for data collection and analysis: speed (100 metres sprint test) in seconds, agility (SEMO Agility Test) in seconds, explosive power (Standing Broad Jump test) in centimetres, and cardiovascular endurance (Harvard Step Test) in fitness index. All tests were administered under standardised conditions, and the collected data were used for the statistical analysis required for the present study.

Research Design and Statistical Technique

For the purpose of the study, an independent t-test was used to analyse the data on selected biomotor components of ball and racket game players of Manipur. The analysis was carried out using SPSS software (Version 22.0). The level of significance was set at 0.05 to determine the statistical differences between the two groups.

Analysis of Data

In scientific research, data analysis is carried out to find solutions to the problems under study in a system-

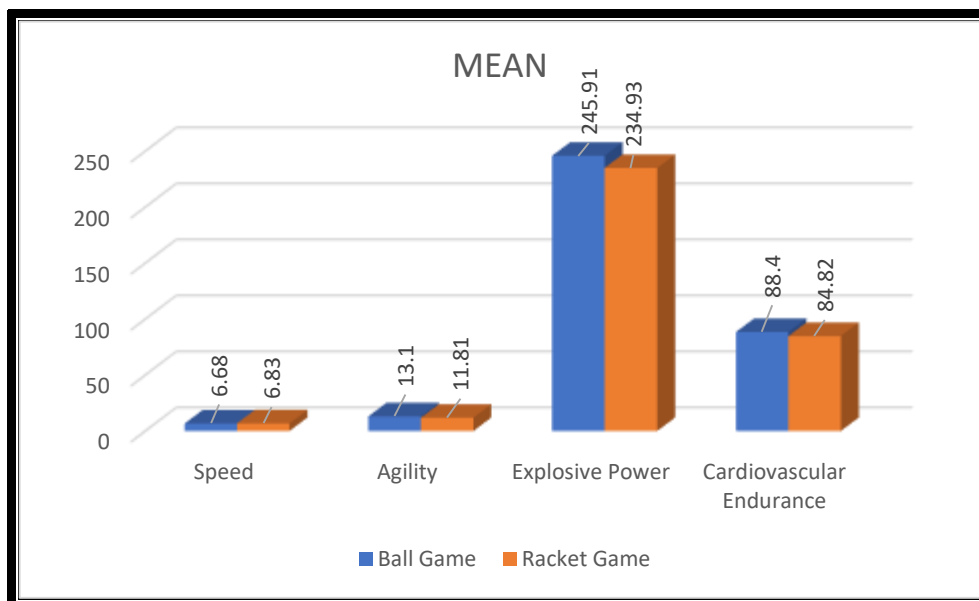
atic manner, so as to achieve the research objectives and draw meaningful scientific inferences from the study.

Table-1
T-Test on selected Biomotor Components between Ball and Racket Game Players

Variables	Group	N	Mean	SD	MD	df	't' Value	Sig.
Speed	Ball Game	30	6.68	0.17	0.15	58	3.078*	0.00
	Racket Game	30	6.83	0.19				
Agility	Ball Game	30	13.10	0.85	1.29	58	9.42*	0.00
	Racket Game	30	11.81	0.73				
Explosive Power	Ball Game	30	245.91	13.23	4.98	58	3.26*	0.00
	Racket Game	30	234.93	12.85				
Cardiovascular Endurance	Ball Game	30	88.40	5.43	6.68	58	2.73*	0.01
	Racket Game	30	84.82	4.67				

* Significant at 0.05 level of confidence
(Table values, df of 58 is 2.001)

Figure-1
Graphical Representation of the Mean of Selected Biomotor Fitness Components of Ball and Racket Games



Results

The findings of the present study revealed significant differences between ball game players and racket game players in selected biomotor variables. In speed, ball game players (Mean = 6.68, SD = 0.17)

performed better than racket game players (Mean = 6.83, SD = 0.19) as the obtained t-value of 3.078 was significant at the 0.05 level ($p = 0.003$). In agility, racket game players (Mean = 11.81, SD = 0.73) showed better performance than ball game players (Mean = 13.10, SD = 0.85) as the calculated t-value of 9.42 indicated a significant difference between the groups ($p = 0.00$). For explosive power, ball game players (Mean = 245.91, SD = 13.23) demonstrated superior performance compared to racket game players (Mean = 234.93, SD = 12.85) as the obtained t-value of 3.26 was found to be statistically significant at the 0.05 level ($p = 0.00$). Similarly, in cardiovascular endurance, ball game players (Mean = 88.40, SD = 5.43) performed better than racket game players (Mean = 84.82, SD = 4.67). The calculated t-value of 2.73 showed a significant difference between the two groups ($p = 0.01$).

Conclusion

Based on the findings of the study, it was concluded that significant differences existed between ball game players and racket game players in selected biomotor variables. Racket game players exhibited better agility performance, whereas ball game players showed superior speed, explosive power, and cardiovascular endurance. Therefore, the nature and demands of the respective sports appear to influence the development of specific physical fitness components among the players. It is suggested that coaches and trainers should provide sport-specific training programmes to improve the physical fitness components required for ball games and racket games. Regular fitness assessments should also be conducted to monitor the performance level of players. Further studies may be undertaken with larger samples and additional variables for a better understanding and generalisation of the results.

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