

## ENERGY SYSTEMS AND PHYSIOLOGICAL DEMANDS IN BASKETBALL AND NETBAL

Bhagat Singh

M.D.University Rohtak, India

### ABSTRACT

*The Aerobic energy system provides a steady supply of energy throughout the duration of a game.( Netball is having more aerobic activity in comparisons with the Basketball), and a player must have trained cardiovascular system in order to provide the necessary amount of oxygen.The dominant energy system in basketball and Netball are different because of the nature of movements in both the games under study. Netball is considered the game of interval whereas game of Basketball is known for explosive speed and power. By comparing four of the playing positions-center, goal shooter, goal keeper and goal defense- the information is gathered. The goal shooter caught the ball on more occasion than the other positions, and was stationary for a considerable amount of time during the game. . The timing and amount of energy liberation largely depend upon the conditioning and delivery of energy systems of a player. That would be the deciding factor in the performance of an individual player.*

*Key words: Energy System, Physiological Demands and Player.*

### INTRODUCTION:

Success in netball and Basketball requires a player to be trained in all the components of fitness (endurance, Speed, strength, power, agility and flexibility), and coaches must ensure that players exercise at intensities that equate to those experienced in match conditions. A coach must ensure the training programme is designed according to scientific training principles in order to improve a player on court performance. Players need a high level of skill, aerobic and anaerobic fitness, and the body uses three energy systems that work simultaneously. The dominant energy system in basketball and Netball are different because of the nature of movements in both the games under study. Netball is considered the game of interval whereas game of Basketball is known for explosive speed and power. One cannot think of good performance until and unless one does not have powerful energy system which is predominantly used in that particular game. The nature of

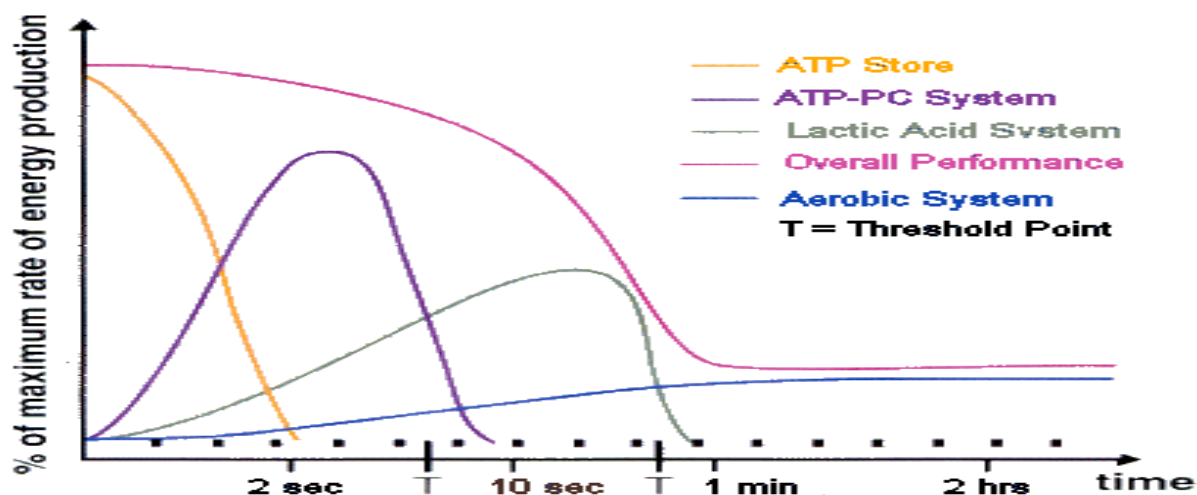
physical movements poses different physiological demand. Therefore the delivery of energy system will decide the level of performance in an individual.

#### ENERGY SYSTEMS:

There are usually three energy systems which the body is uses and all these work simultaneously. The contribution of each system depends upon the intensity and duration of physical activity. The ATP-PC and the lactic acid system operate without use of oxygen. The ATP-PC system provides an immediate source of energy for high intensity activities for example jump shot in Basketball, Fast break in Basketball and rebounding in Basketball and jumping and short sprinting and throwing in netball/basketball. This system can only provide energy only for 10 seconds and body requires approximately 20 seconds recovery time before the intensity can be repeated. The lactic acid system provides an energy supply for high intensity work ranging from 2-3 minutes. This system does not require oxygen, as it utilizes glucose as source of energy. Lactic acid is a by-product of this system, and this can cause muscular cramps and discomfort; as fatigue set in, there is a rapid decrease in performance.

A player would need 2-3 minutes to recover before the equivalent intensity of work could be carried out again. The Aerobic energy system provides a steady supply of energy throughout the duration of a game. (Netball is having more aerobic activity in comparisons with the Basketball), and a player must have trained cardiovascular system in order to provide the necessary amount of oxygen. A coach must understand the contribution of three energy systems when planning training programme to Netball and Basketball players.

It should ensure that players maintain appropriate work to rest ratio with in training session. The intensities experienced in training should simulate those encountered in a competitive match.



Different Energy System working in Human Body

**NATURE OF MOVEMENTS IN NETBALL AND BASKETBALL:**

Most netball players train together and complete identical training task, similarly Basketball player train together and Basketball players too have identical training task. Which can mean that the physiological demands of seven paying position in net ball and five in basketball are often disregarded. In terms of acceleration, the sprinting effort of a players last last for 2-7 seconds and these are approximately 100 of these executed by a player in any one game. A study carried out in netball by Allison(1978) identified that there are significant differences in the amount of time spent, sprinting between the playing position as see in box below

**TIME SPRINTING IN A NETBALL GAME (%)**

Wing attack/wing defence	16.3%
Center	11.8%
Goal attack/Goal defence	5.9%
Goal shooter/Goal keeper	4.1%

Recording of player movements indicate the following differences between the playing positions.

The defensive players shuffled more

- . The center spent the highest amount of time slow jogging.
- . The center have the least amount of rest time
- . Center executed more passes than any other position.
- . Jumping actions were executed the most by circle players.

By comparing four of the playing positions-center, goal shooter, goal keeper and goal defense-the following information provides useful guidance for devising training schedules; The goal shooter caught the ball on more occasion than the other positions, and was stationary for a considerable amount of time during the game. It is also important to note that the goal shooter in this analysis had the lowest heart rate throughout the match. The goal shooter spent less time jogging when compared to the center and goal defense position, but did execute similar locomotors activity when compare to goal keeper.

The center position was involved in far more sprinting and jogging throughout the game when compared with other positions, high lightening the dominance of running at a steady state interspersed with sudden sprinting movements. A center will run an average of 6 km per game at the elite level. The goal keeper and goal defense were involved in more jumping and shuffling movements than any other positions reviewed. The goal keeper have similar motor pattern to the goal shooter, and often a jump was executed from a stationary position, unlike the jump executed on the move by the other court positions

In Basketball movements are quite different and therefore the physiological demands poses on the body is all together different than netball.

## CONCLUSION :

Like the techniques and tactics session are conducted to get the good performance in the games of netball and Basketball. There is an equally important to strengthen our energy systems which are pre dominantly used in netball and Basketball. Energy systems are also trainable like speed strength and endurance. The timing and amount of energy liberation largely depend upon the

conditioning and delivery of energy systems of a player. That would be the deciding factor in the performance of an individual player.

References:

1. Brooks,G.A.,and Fahey,T.D.: Exercise Physiology; Humanbioenergetics and its applications.Newyork,John Wily,1984,p.76
2. Costil,D.L.,and Fox,E.L.,energetic of Basketball Med Sci Sports 1969.
3. Hermansen,L; anaerobic energy release.Med Sci Sports 32-34 1976.
4. Cerretelli,P., Ambrosoli,G: anaerobic recovery in man. Europ J appl Physiol,1975.
5. Mathews,D.K., and E.L.Fox. The physiological basis of Physical-Education and athletics 6<sup>th</sup> edition 2009.