

# Auditory reaction time and visual reaction time in basketball players of Ambajogai Maharashtra

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## Abstract

**Background:** The reaction time (RT) is the time interval between the sensory stimulus application and its proper behavioural response. Speed of movement and quick reactions are the main qualities in the basketball players. In basketball players reaction time is of great importance. **Aims and Objective:** 1. To determine the auditory reaction time and visual reaction time in normal healthy individuals and in basketball players 2. To compare auditory reaction time and visual reaction time of healthy individuals with basketball players. **Material and Methods:** The present study was carried out on 50 male basketball players in the age-group of 18-25 years who were playing daily for 1-2 hours. They were compared with that of the 50 healthy controls in the age group of 18-25years. **Results:** There was significant decrease in auditory and visual reaction time in basketball players as compared to healthy controls.

**Keywords:** reaction time, auditory, visual, basketball player.

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reaction time is of great importance and this have a definite advantage over slower reacting men.<sup>3</sup> Basketball players and coaches are starting to realize importance of reaction time in their performance. Because of this realization, research is necessary to show basketball players and coaches the effect of reaction time on their performance

## MATERIALS AND METHODS

The present study was carried out in the Department of physiology. The study protocol was approved by the Institutional Ethical committee. Before enrolment in the study, informed consent was obtained from each subject.

**Study Design:** Cross-sectional Study.

**Selection of study groups:** All the subjects with age between 18-25 years divided in two groups, each of 50 subjects as follows.

**Group 1:** Apparently healthy male subjects in the age group of 18-25 years who were selected from local areas who were not playing basketball or not doing any athletic events.

**Group 2:** Male basketball players in the age group of 18-25 years playing daily for 1-2 hours.

## INTRODUCTION

The reaction time is the time interval between the stimulus application and the initiation of the proper behavioural response<sup>1</sup>. It involves stimulus processing, decision making, and response programming. the reaction time provides an indirect index of the processing capability of CNS and sensory motor performance<sup>2</sup>. Speed of movement and quick reactions are the main qualities in the basketball players. When the offensive player makes his move, the difference between a slow and a fast reaction by the defensive player can determine his success or failure, so

Basketball players were individually matched for age, height, and weight with controls. Control subjects were of similar socioeconomic group, assessed by a questionnaire.

**Sample size:** 50 subjects were taken in each group.

**Inclusion criteria:** Apparently healthy male subjects in the age group from 18-25 years who were selected from local areas who were not playing basketball or not doing any athletic events. Male basketball players in the age group of 18-25 years playing daily for 1-2hours.

**Exclusion criteria:** Subjects having H/o diminished hearing or vision and color blindness. Subjects having H/o neuromuscular disease. Subjects having H/o any sports injury to limbs Those not practicing regularly Subjects having H/o diabetes mellitus. Subjects having H/o head injuries. Subjects having H/o cardiovascular diseases.

**Procedure**

**The procedure was done in the following steps:** The detail history, general and systemic examination of each subject was carried out. Acuity of vision for near and distant vision, tests for color blindness were carried out. Acuity of hearing was tested with tests of hearing. The recording of the audio-visual reaction time: Each subject was made familiar with the apparatus and the procedure, to alleviate any fear or apprehension. The Auditory Reaction Time (ART) and the Visual Reaction Time (VRT) were measured in a quiet room of the Department of Physiology at GMC, Ambajogai. The ambient temperature which was maintained was 26±1°C. These tests were done with the subject sitting comfortably in a chair. The ART and VRT were measured by using a reaction time instrument which was supplied by Medicaid Systems RTM-604 (Chandigarh, India). This instrument was equipped with a sensitive quartz clock which measured up to 1/10th of a msec. The accuracy of this instrument was ± one digit. All the subjects were right handers and they used their right hands to press the switch to stop the quartz clock of the apparatus. Before measuring the VRT, each subject was asked to identify the flashing of the yellow light. subject was instructed to press the switch as soon as he saw the light. For measuring the ART, subject was asked to concentrate on the sound signal which was produced and to press the switch immediately. The sound signal was a continuous beep of 1 KHz on the speaker. The intensity of the stimulus was the same for all the groups. To avoid the effect of a lateralized stimulus, the visual and the auditory signals were given from the front of the subjects. From the auto-display, the reaction time was noted. Three readings of each stimulus were noted after giving three practical trials and their mean was taken as the reaction time.

**STATISTICAL ANALYSIS**

For comparing quantitative data unpaired t- test was applied. P value < 0.05 will be statistically significant.

**RESULTS**

**Table 1:** The demographic data of the two study groups

Parameter	Control (Mean±SD)	Basketball players ( Mean±SD)
Age (Yrs)	34.2±5.198	32.06±5.512
Weight (Kg)	58.5±10.25	52.43±13.44
Height(m)	1.620 ±0.070	1.605± 0.076
BMI	22.21±4.198	21.004±4.841

**Table 2:** Mean ART and VRT in control groups and Basketball player groups

Parameter	Control (Mean±SD)	Basketball player ( Mean±SD)	P value
ART(sec)	0.1330±0.0133	0.1279±0.0117	0.02
VRT(sec)	0.1438±0.0122	0.1374±0.0158	0.02

All the calculations and statistics were done using Microsoft Excel 2007 and all the statistics were compared by using ‘‘ graph pad prism 5 software’’ version 5.01. A P- value of less than 0.05 (p< 0.05) was considered to be statistically significant. A p-value of less than 0.01 (p< 0.01) was considered to be highly significant. For each parameter the mean value and standard deviation were calculated in control and basketball player groups and they were compared using ‘unpaired t test’. Thus it is evident from the observation table that, there was significant decrease in auditory and visual reaction time in basketball players as compared to healthy controls.

**DISCUSSION**

The present study shows that, there was significant decrease in auditory and visual reaction time in basketball players as compared to healthy controls. Consistent with our findings, Spirduso<sup>7</sup> (1975)<sup>4</sup> showed that athletes which are physically active have less reaction time as compared to non-athletes. This was attributed to faster central nervous system processing times producing faster muscular movements in athletes. Prabhjot Kaur *et al.*<sup>6</sup> (2006)<sup>5</sup> found that athletes performed better than controls for auditory as well as visual reaction time tasks. N Parekh<sup>5</sup> *et al.* (2004)<sup>6</sup> observed that reaction time for auditory and visual stimuli were less in aerobic exercisers as compared to control. Maunsell JHR *et al.* (2002)<sup>7</sup> concludes that directing attention to a particular location in the visual field improves detection and discrimination, and shortens reaction times in that location relative to others. Shorter reaction time in basketball players could be due to improved concentration and alertness, better muscular coordination, improved performance in the speed and accuracy task. Reaction time in specific movements improves as a result of extensive practice of those concerned movements during playing basketball, therefore reaction time improving training sessions have to be held for basketball players to develop fine motor skills.

## CONCLUSION

Our study showed that the Basketball playing of an individual affected the audio visual reaction time, which was an indirect measure of the sensory motor association.

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