

A Comparative Study of Visual Reaction Time in Basketball Players and Healthy Controls

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Abstracts: Introduction:-Reaction is purposeful voluntary response to different stimuli as visual or auditory stimuli. The present study was conducted to measure visual reaction time in 100 subjects, 50 basketball players and 50 healthy controls. Material & Method: - The visual reaction time was measured by the reaction time instrument in healthy controls and basketball players. Simple reaction time and choice reaction time measured. During the reaction time testing, visual stimuli were given for three times and minimum reaction time was taken as the final reaction time for that sensory modality of that subject. The results were statistically analyzed and were recorded as mean \pm standard deviation and student's unpaired t-test was applied to check the level of significance. Result:- The study shows that basketball players shows faster reaction time than healthy controls. Conclusion: - As reaction time gives the information how fast a person gives a response to sensory stimuli, it is a good indicator of performance in reactive sports like basketball. [Ghuntla T et al NJIRM 2012; 3(1) : 49-51]

Key Words: Reaction Time, Basketball Players, Visual Reaction Time, Alertness

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Introduction: Reaction is a purposeful voluntary response to stimulus. There is a certain time period between application of stimulus and appropriate motor response. Visual reaction time is time required to response to visual stimuli. During day to day life majority of motor work is done by using visual information of surrounding. Reaction time is having mainly 2 components¹. (1) Mental processing time:- which is time required for responder to perceive stimulus, identifying and analyzing of stimulus and decide the proper motor response. (2) Movement time:- it is time required to perform movement after selection of response.

Luce and Welford described three types of reaction time.²⁻⁶ (1) Simple reaction time:- here there is one stimulus and one response. (2) Recognition reaction time:- here there are some stimulus that should be responded to and other that should not get response. (3) Choice reaction time:- here there are multiple stimulus and multiple responses.

Much is known about beneficial effect of exercise on various system and overall health, little research has been done on effect of exercise on mental functions.⁷ Basketball player has to give proper and quick response during the game. They have to throw ball in proper direction.

The study has been undertaken to see the effect of sports training , which involves decision making during game, on speed of cognitive processes (reaction time) and to compare with control group which is not involved in regular sports activity.

Material and Methods: After obtaining Approval from institutional review board present study was conducted in 50 controls and 50 basketball players of Bhavnagar district. Personal history and medical history of both groups was collected in pre-designed Performa. Medical history was taken to rule out any medical or surgical disease which would affect reaction time of individual. After taking consent, Reaction time was measured with multiple choice apparatus 653MP (reaction time apparatus) with accuracy of \pm 0.001 seconds. Visual reaction time was measured under two categories. (1) Simple reaction time, where subject has to respond to visual stimuli by pressing key and (2) choice reaction time, Where subject has to respond to different colored stimulus by pressing respective key. Subjects were given practice session in which the subject responded to visual stimuli till near about constant values of reaction time come and then visual stimuli were given for 3 times and minimum reaction time was taken as a final reaction time for that sensory modality of that subject.

Data was collected and was statistically analyzed. Reaction time were taken as mean \pm SD. The level of significance between basketball players and controls was tested by students T-test(Unpaired). The observation was taken as a significant of p value less than 0.05.

Result: Visual reaction time found to be significantly (P-value less than 0.05) less in basketball players as compared to controls in simple reaction time task (Table 1)

Table-1:- Difference in simple visual reaction time in 50 healthy controls and in 50 basket ball players

VRT simple (Controls)	VRT Simple (Basketball Players)	P-Value
0.15690+0.02624	0.13690+0.02624	Significant

Visual reaction time found to be significantly (P-value less than 0.05) less in basketball players as compared to controls in choice reaction time task. (Table-2)

Table-2:- Difference in choice visual reaction time in 50 healthy controls and in 50 basketball players.

VRT choice (Controls)	VRT choice (Basketball Players)	P-Value
0.29968+0.07461	0.26558+0.06699	Significant

Discussion: present study indicates difference in performance of two groups of subjects under study. Basket ball players and healthy controls. Basketball players were found to have significantly faster reaction time than controls. Reaction time is an important indicator of speed of response to any stimuli. It requires to be as less as possible in case of sports , driving etc. Results from present study parallel which have been found in past literature. Kramer et al. ⁸ found in his study that participants who completed a six month aerobic exercise program exhibited improvements in reaction time. Dustman, emerson et al.⁹ found that exercising subjects processed faster components to their visual evoked potentials than those who did not exercise. Nougier, Ripoll and stein ¹⁰ suggest that atheletes has better reaction time as compared to

control subjects. Casteilo and umita ¹¹ found that athletes were significantly faster than controls on incorrect trials that required the participants to direct their attention left, right or above the point of fixation.

Basketball player has to give a good attention to the stimuli and has to be alert to give a proper motor response. Motor response execution is a physical task, so it is logical that people trained in physically reactive sports like basket ball may have superior ability to select a correct motor response.³ Although the mechanism behind exercise and human information processing have not been exactly identified. There are several possible mechanism which provide primary support for different hypothesis. Different direct and indirect mechanisms could explain relationship between exercise and mental processing. Perhaps the most popular mechanism is the idea that those individuals who exercise at moderate to intense levels have higher rates of cerebral blood flow. This increased amount of blood flow in the brain results in improvements in cognitive functioning due to increased supply of necessary nutrients, such as oxygen and glucose.^{12,13} Research on trained athletes whose sports require high level of motor reactivity suggest that physical reactive sport players have superior reaction time compared to healthy controls. ¹⁴

The quicker reaction time in basketball players compared to controls is due to improved concentration, alertness, better muscular co-ordinatin and improved performance in speed and accuracy task.¹⁵

Limitation of study:- Our study conducted in small group size. For more information study should be conducted on larger size of sample.

Conclusion: Our study concluded that persons involved in sports are having good reaction time as compared to controls. Nowadays childrens are more involved in videogames like indoor games, while involvement in outdoor games would not only

make them physically healthy but would also improve their alertness, concentration and ultimately reaction time, which would also be helpful them in day to day life as while driving it is more important to take certain decisions as quickly as possible.

Acknowledgements: I am thankful to Department of Physiology, Government Medical College, Bhavnagar for their help in this study.

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