Comparison of visual parameters in young basketball players and nonathletes

Joanna Maria Samól[*1], Malwina Geniusz[1,2]

[1]*Geniusz 2M Medical sp.z o.o, optician's, Rozbrat 8A, 50-334 Wroclaw*

[2]*Department of Optics and Photonics, Faculty of Fundamental Problems of Technology, Wroclaw University of Science and Technology, Wyb. Wyspiańskiego 27, 50-327 Wrocław*

[*] *Corresponding author: joannasamol99@gmail.com*

Summary: The scope of the work included the development of the methodology, research and statistical analysis of visual parameters, such as: accommodation facility, near point of accommodation, near point of convergence, saccades facility, perception of peripheral vision. Some visual parameters are better in young athletes than in those who do not train.

Keywords: sport, children, accommodation, peripheral vision

INTRODUCTION

Sherman concluded that visual skills can be exercised and strengthened through visual training [1]. Therefore, it can be concluded that regular training is part of vision therapy. Athletes undergo this process for a large part of their lives. Loran and Griffiths found that visual skills may be even more important than commonly believed, noting that there was a relationship between visual skills and playing skills in a group of 14-year-old footballers [2]. Any motor activity, including sports training, improves the coordination of the motor system, improves vision processing, and improves perception and cognitive skills [3]. Thus, there are no obstacles to hypothesize that increased physical activity of children training basketball will result in better results in selected visual tests. It can also be assumed that children who spend more time at home and do not have the opportunity to exercise the dynamic aspects of the visual process will achieve lower results in visual tests, especially in tests assessing the work of the accommodative-vergency system or eye motor skills. The aim of the study was to compare selected visual parameters of children training basketball and children who do not practice any sports discipline. The results collected in the group of children training basketball were compared with the results obtained for the control group.

METHODS

The research was carried out on players of the "MUKS Szok Bojanowo" club training basketball three times a week for min. 4 years and primary school students who do not practice any sports discipline. A total of 17 people were included in the study: 8 people in the age range of 12-14 years training basketball and 9 people in the age range of 10-15 years, who are the control group. The accommodation facility was assessed using an accommodative flipper of ±2.0 D. The near point of accommodation and convergence was measured with an accommodometer. Saccadic facility was evaluated using the DEM (Developmental Eye Movement) test, and the mean range of peripheral vision (α) was determined using a peripheral vision card.

RESULTS

There were statistically significant differences in the results of the accommodation facility (Fig. 1)

and in the mean range of peripheral vision perception (Fig. 2).

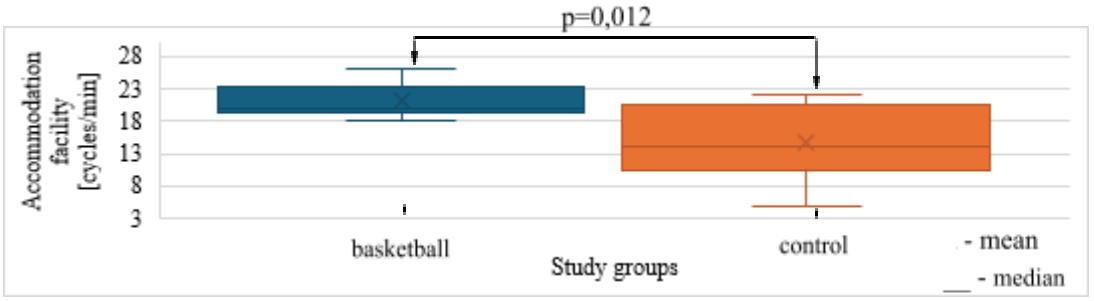

Figure. 1. Binocular accommodation facility in individual study groups

A greater value of the mean and the median can be noticed for people training basketball. In the control group, there is a greater dispersion between quartiles and a lower value, both maximum and minimum, than in the group of basketball players.

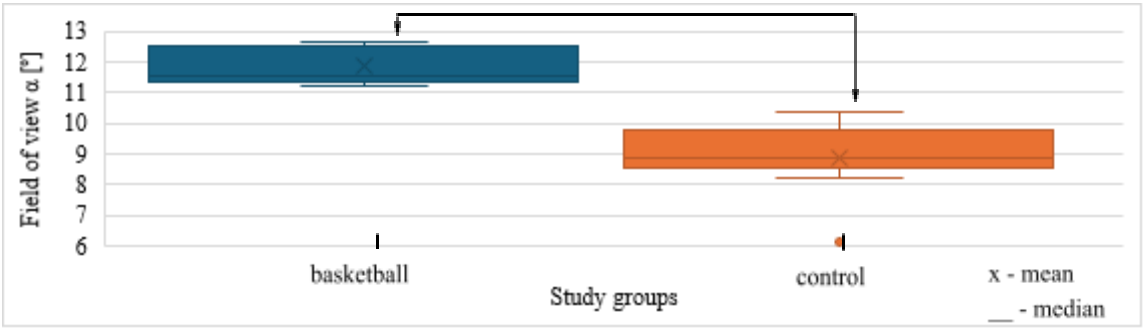

Figure. 2. Mean range of peripheral vision perception in individual study groups

The chart above shows that the minimum value in the basketball group is greater than the maximum value in the control group. The differences in the results concerning the near point of accommodation, near point of convergence and the facility of saccades are not statistically significant. The obtained results showed that basketball players have better accommodation skills than children who do not play sports. Both groups are in a similar age range, so it can be assumed that sport played a role in developing more efficient accommodation among basketball players. Based on the theory presented by Press LJ et al . it is known that a basketball player with poor accommodation ability would need more time to make sure that he is able to look from ball to basket and basket to ball, which is necessary to make an accurate throw [3], and basketball players tested have parameters accommodation in the norm [4], so it can be presumed that their throws will be quick and accurate. People in the control group reported having worse vision through the positive lens of an accommodative flipper, which could mean problems with loosening accommodation, possibly related to excessive visual work at close range during the pandemic and distance learning. The obtained results of the average range of peripheral vision perception indicate that basketball players have a greater average range of peripheral vision perception than students, which shows the positive impact of sport on the development of peripheral perception from an early age. According to the theory of Press LJ et al. it can be concluded that training with the use of a ball influences the development of better peripheral awareness [3].

CONCLUSIONS

The aim of this study was to compare selected visual parameters in the group of basketball players

and students. The work deals with important issues concerning the influence of sport on the development of visual skills. Studies have shown that some visual parameters achieve better values in young athletes than in people who do not train. It is worth continuing the research, analyzing other visual parameters related to the eye motor and binocular vision, it is also worth considering expanding the research group to include children training in other sports. These research results can improve people's awareness of the importance of sport in developing certain visual functions.

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