

A Review Paper on Hockey Sport

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ABSTRACT: *Using databases available on the Internet, the number of scientific papers on the subject of field hockey were examined. Basic procedures. As a result, 208 scientific studies covering the fields of biochemistry, physiology, sport injuries, psychology and tactics were found, which were published within the last 50 years (from 1960 to 2010). Given field hockey's success and recognition as an Olympic sport, the number of research articles focused on field hockey was significantly lower relative to the number of publications on other organized sports, such as soccer, basketball, or baseball. It was found that the highest number of publications (61.06 per cent) came from five English-speaking countries (UK, USA, Canada, Australia, and New Zealand), with the rest focusing on sport psychology, injuries, and biochemistry. What was discovered was that in comparison with other team sports, the vast majority of scientific studies used field hockey merely as a reference. The differing subject complexity of the research studies contained in the repositories greatly impedes an accurate comparison of results, particularly given that most of the studies focused only on a few chosen facets of the question matter and were, or were not replicated, mostly small sample studies.*

KEYWORDS: *Biochemistry, Physiology, Tactics, Nutrition, Injuries, Psychology, Sport.*

INTRODUCTION

Thanks in part to the Web, the search for science material will begin by inserting a few key terms into a search engine with a specialist website, which houses original research articles written in community-wide specialist journals, meaning that the discovered documents are both reliable and of good quality. These repositories also feature a range of analysis works that include important science analyzes conducted in different scientific fields. Nearly any sport can be defined by, among other factors, what words in the biological sciences are relevant to what scientific results. The literature on sports which has a long history, such as field hockey, in particular. The studies on the biological dimensions of field hockey that have been published to date are very random, incomplete and typically do not require comparisons with the results of our current study. Related conclusions are made on other research fields, which from a biological viewpoint often include field hockey. Those include psycho-logy, diet (especially the supplementation-related problems), and strategies. Therefore, the aim of this paper is to analyze and explain the current state of scientific research on the biological dimensions of field hockey, including, but not limited to, issues concerning physical health, physiological and psychological comfort, as well as the strategies used to track these features in players [1].

MATERIAL AND METHODS

Hosted on a variety of available websites, the research resources consisted of scientific field hockey articles. They were accessed by searching for publications in the PubMed and EBSCOhost repositories covering a range of subjects, including Academic Quest Premier, SPORT Discus, Hospitality & Tourism Complete, Health Source: User Version, Health Source: Nursing/Academic Edition, MEDLINE, Business Source [2]. Complete, Library, Information Science & Technology Abstracts, Master FILE Premier, Newspaper Source, Regional Business News, Agricola, and Academic Search Complete. Moreover, in order not to omit other valuable studies relevant to this paper which have not been included in the above mentioned databases but are available on the Internet, www.scholar.google.pl was also used. The quest included all publications that were included in the libraries between 1960 and 31 December 2010, accessed after inserting the word "FIELD HOCKEY".

Physiology

The datasets reviewed included 43 physiological experiments that were conducted on field hockey teams. These mostly focused on the cardiovascular ability of an athlete, the classification of their muscle fibers, and the results of workout testing on chosen blood parameters. Perfect conditions [3]. Several scientists performed electrophysiological experiments to determine basic reference values which could be helpful in the preparation phase and later in the treatment of sport injuries. Elite field hockey team electromyography tests show different values of ulnar and tibial motor nerve conduction velocity compared with values obtained by soccer and tennis players. In the other hand, comparable electromyographic tests of bicep femoris and semitendinosus muscle function in field hockey players have demonstrated much greater ability to sustain an extended knee posture without experiencing any discomfort compared to those who do not perform any sport. Such a capacity (or lack thereof) is determined by the composition of muscle fibers, according to Jaeger et al. Work performed on a sample of female hockey players and a control group showed that the sportswomen had a higher proportion of oxidative-glycolytic muscle fibers (FTa), and their share and histochemical features were close to those usually seen in males. Muscle strength and durability of the body often rely on the nature of the connective tissue present which forms tendons and muscle attachments among other things [4].

Muscle strength and durability of the body often rely on the nature of the connective tissue present which forms tendons and muscle attachments among other things. Hydroxyproline is the principal amino acid that forms connective tissue. The metabolism rate of the amino acid correlates with the amount of training undergoes, according to Krawczyński et al. Hydroxyproline excretion of urine has been found to be greater of cyclists with a few years of experience (1–3 years) than in field hockey players who had a longer training period (over 6 years); Both in rest and after exercise. The findings of this work also indicate that the superiority of some fitness factors in the training cycle affects the connective tissue metabolism. The urine of well-trained athletes who were exposed to a medium-intensity workout check showed an elevated amount of excreted creatine. However, field hockey players' physical performance has had a smaller impact on creatinuria level. Hence, one may presume that adapting to long-term training more effectively correlates with the faster use of creatine produced in working muscles. Bittner et al. studied the mechanism of preserving proper acidbase homeostasis by the kidneys.

They demonstrated that the fitness level of a field hockey player was not characterized by variations in the renal balance during sub-maximum exercise, and that such regulatory activity was more efficient; The longevity of their athletic career relied on the blood pH, pCO₂ and pO₂ levels as well as the concentration of hydrogen carbonate and ammonium ions. Moreover, in the case of female field hockey players, it was clarified that physical activity, which does not cause metabolic acidosis, can trigger regulatory processes in the reins [5]. A number of studies on field hockey players' physiology stated that routine training and high physical exercise are causing changes in the structure of the body including bone mass. Bone metabolism may be subjected to sudden changes, particularly in women, as it is linked to hormonal regulation, especially that of estrogens A study of bone structure in people who play touch (basketball, netball), restricted touch (running, field hockey), and non-contact sports (swimming) and a control group showed a strong association between the degree of contact encountered in sport and the overall bone density and higher leg and arm bone mineralization. A study of bone structure in people who play touch (basketball, netball), restricted touch (running, field hockey), and non-contact sports (swimming) and a control group showed a strong association between the degree of contact encountered in sport and the overall bone density and higher leg and arm bone mineralization. A team of researchers led by Sparling compared the 1996 United States Olympic Team for Women's Field Hockey's three separate methods of assessing overall bone mineral density and body composition: dual energy X-ray absorptiometry (DXA), hydrostatic measuring, and the number of seven skin folds. The findings we obtained were very convergent. What was also shown[35] was that the mineral density of the forearm bone in female field hockey players improved during their training season [6]. Around the same time, the overall body weight decreased while the lean body mass increased. It was also determined that muscle strength and average uptake of oxygen (VO₂max) during the training season increased [7].

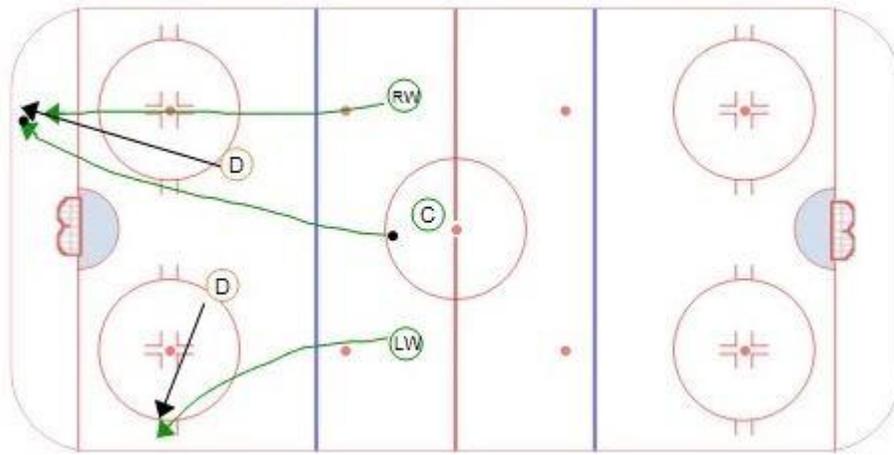


Fig 1. Hockey Tactics

Tactics

Game tactics are, according to one description, the purposeful, efficient and prepared way to compete which pits one's own and the skills of their rivals during a match. This also specifies the competition's playing area and conditions, and the laws and regulations specific to a particular game. Therefore, with an understanding of what strategies are, it will require the inclusion of many indexes, including those that are biochemical with respect to measures that assess the stamina ability of a player. It also touches on numerous other physiological and biochemical issues, which frequently are only indirectly alluded to in regards to a players' fitness, such as their body position their ability to be in peak physical shape. Even a simple review of the available research shows a lack of evidence stemming from a more in-depth motor study of field hockey players during matches and activities about various age ranges, as well as the gender or length of one's sporting career. As in other thematic groupings. Work performed by Reilly & Seaton has demonstrated that the traditional body configurations assumed while playing a field hockey match impact overall posture formation, e.g. shortening of the spine when moving, as well as physiological test tests [8].

Depending on the position they occupy, the field hockey players cover a distance ranging from 9300 to 10870 meters. What was also shown was that the mineral density of the forearm bone in female field hockey players improved during their training season.

Around the same time, the overall body weight decreased while the lean body mass increased. It was also determined that muscle strength and average uptake of oxygen (VO_{2max}) during the training season increased. Those time relationships are not set with each played game and are subject to major alterations. The stopover du-ration of three consecutive plays, for example, was 7.4, 11.2 and 15.6 percent of the game period, respectively. Close study of the time-motion during matches involving female field hockey players was also carried out. The distances covered in three consecutive matches were slightly less than those covered by males, and ranged from 3850 to 4250 meters on average. Related findings have been obtained from work carried out on a group of hockey players on the amateur field. The method of holding a field hockey player in optimum condition includes using specified physiological metrics such as heart rate (HR), optimal intake of oxygen (VO_{2max}), or time to fatigue.

In practice, well-trained players who are exposed to high-intensity physical activity show the maximum VO_{2max} values, and their recovery time is longer. A series of measures is used to collect information on their performance levels during the training season. It has been found statistically that there are major differences in test outcomes based on the time that they are conducted, and is the physical state of a player to determine. In the case of men, Australian football, soccer, and rugby players have seen a lower variability and a higher variability among softball players. However, the seasonal variations of fitness levels for women playing soccer, as found by a number of physical performance tests, were lower compared to female field hockey players. The wide variety of physical ability testing facilitates a greater degree of evaluation and selection

which is especially useful in assessing the motor skills of a player. Often, the aim of research in such a field as strategies is to analyze the physical ability tests to determine players' optimum motor skills [9].

Injuries

Authors address accidents ($n = 36$, 17.31 percent) in a number of ways, such as those arising from field hockey regulations, technical devices (sticks, shin guards), and even local facilities (ground surface). The occurrence of injuries also correlates with the intensity of physical effort, the number of matches played during the training. The role the player is playing, and what tactics have been implemented. A limited number ($n = 8$) of 36 reports identify particular cases of injury in male and female hockey field teams. One factor which played a significant role. = The ground surface on which matches are played is one factor that has played a major part in the injuries that field hockey players suffer. Depending on what surface is used, the dynamics of the players' motion and the speed of the game are different. A study of the individual views of field hockey players during an intense match on both an indoor surface and artificial turf suggests that the latter is distinguished by a higher degree of toughness, which in turn resulted in a better overall game play induced by higher ball rebounds. It has also been identified that synthetic turf has resulted in a higher prevalence of acute injuries, largely due to the increased speed of the updated equipment [10].

Nutrition

Seven of the 208 field hockey experiments examined were concerned with diet. They concentrated on determining the calorific content of foods consumed by athletes and on optimal hydration. Authors have addressed the question of the use of vitamins and additives in diet and the athletic fitness effects they had on field hockey players. The need to examine the supply of nutrients to athletes, which plays a key role in sustaining good physical health, has been reported.

Such a dietary study, conducted by the Canadian Olympic Women's Field Hockey Team, showed that the overall 24-hour energy content of their diet was 1966.6 kcal, of which 42.0 per cent was starch, 38.7 per cent fat, and 15.3 per cent protein. This diet is combined with an average maximum oxygen uptake (VO_{2max}) of 51.0 mL / kg / min. And the corresponding energy consumption did not ensure that a majority of athletes meet the required energy requirements. Nutritional deficiencies noted in these players were, among other things, the absence of some vitamins and iron. In addition, Lee et al. have shown that, apart from iron deficiency, insufficient diet may also induce calcium. Inadequacies. Successful efforts to avoid shortages with the use of expressly formulated iron supplements in sportswomen that were still deficient in iron but did not exhibit the signs of anemia clearly showed that iron injections were more successful than iron tablets. The concentration of ferritin (iron storage protein) in the blood rose from 20 ± 2 to 63 ± 7 $\mu\text{g} / \text{L}$. A sequence of doses of 27 ± 3 to 41 ± 5 $\mu\text{g}/\text{L}$ in female athletes who have taken orally iron supplements. The dietary supplement most often used by athletes is creatine, which typically increases the concentration of phosphocreatine in muscles, an agent responsible for anaerobic metabolism.

Anthropometrics

It cannot be ruled out that creating a somatic and psychological profile for those wishing to perform a specific sport can enable team managers to make the right choices when selecting potential players. Keogh et al. pointed out that the structure and configuration of the body can influence tactical features, i.e. strength, speed and aerobic power; All of which mark the gap between a well-trained and badly qualified field hockey player. There is a great deal of variety in the science of people playing field hockey. More generally, the players are slim (ectomorphic) with different muscular builds (mesomorphic), with different builds usually related to the position in which they play. The female goaltenders are distinguished by the highest body mass and the highest proportion of weight, although the ratio in body building and structure was smaller among players playing other positions. It has been found that field hockey players have different physical characteristics depending on their country of origin. A list of Asian and European field hockey players was announced. That the former had not only a body shape with greater muscular traits, but also a larger skeleton.

Psychology

Psychology research (n = 40, 19.23 percent) concentrate on changes in the actions and understanding of athletes when presented with a significant and at a given place. They also explore facets of players' emotions and emotional interactions whether they win or lose. Issues related to the backgrounds and age of players, their roots and social standing in the literature available, Christian beliefs and sexual orientation are discussed quite frequently. Psychological causes, aside from having an effect on physical fitness, express themselves as changes in the biochemical parameters in the blood of the athlete, typically in the form of hormones. Participation in sporting competitions has been found to unbalance the release of sex hormones in females. The level of the luteinizing hormone (LH) rose over time from pre-training to competition, the level of progesterone rose only during the training phase, while the concentration of estradiol decreased during tournaments. Only the concentration of follicle-stimulating hormone (FSH) has been shown to be high. Stability over the whole testing period. The findings have showed that female field hockey players had greater responses to the imminent game time, which was evidenced by an rise in the production of adrenaline and noradrenaline, but not cortisol, as determined in the tests. Samples of saliva taken twenty-four, two and one hours before the tournament.

Biochemistry

Biochemistry experiments (n=32; 15.38%) are mainly concerned with concerns relating to body reactions to physical exercise and the properties of both aerobic and anaerobic metabolism of field hockey players as a response to physical activity. Compared to other competitive activities, such as soccer, there was a shortage of papers providing a broader cross-section of study issues. Usually, in order to track fitness rates of sportsmen, biochemical indices have been calculated by the use of body fluid count. Blood checks were the most commonly conducted on field hockey players used to assess lactate concentration. Its titration. According to Strzelczyk et al, an evaluation of the improvements that have been observed during the year's training process helps one to determine the extent of readiness of players for action in terms of their performance level. Increasing the concentration of lactate during a daily warm-up can also help to determine the body's tolerance to anaerobic metabolism and improvements in the concentration of lactate. That factor helps one to assess the dedication of a field hockey player to a match, according to Ghosh et al. It should be remembered, however, that the high rate of lactate synthesis in the working muscles greatly raises the concentration of hydrogen ions circulating in the blood, contributing to metabolic acidosis. This, in effect, contributed to a decline in the ability to perform short-term tasks. Physical workouts of female field hockey players. According to Spencer and others,

CONCLUSION

An analysis of the academic studies that concentrated on field hockey as found in the reviewed repositories shows that when it comes to studying field hockey sport scholars had a wide variety of interests. Due to the comparatively limited number of articles compared to other competitive sports, however, the research knowledge they offer only allows for a detailed assessment of a given topic. In fact, as observed in various field hockey articles, it was just a point of reference in analysis on other team sports. The consequence of such a limited number of field hockey studies is the difficulty in offering a detailed assessment of certain topics, particularly when applying additional parameters such as gender, age, or duration of sample studies. The authors did not perceive any empirical explanations why a sport as common as field hockey was so rarely subjected to more investigative study, particularly in biochemistry, physiology, psychology and nutritional terms.

REFERENCES

- [1] A. Sharma, V. Tripathi, and S. Koley, "Correlations of anthropometric characteristics with physical fitness tests in Indian professional hockey players," *J. Hum. Sport Exerc.*, 2012, doi: 10.4100/jhse.2012.73.09.

- [2] H. B. Sharma and J. Kailashiya, "Gender difference in aerobic capacity and the contribution by body composition and haemoglobin concentration: A study in young Indian National hockey players," *J. Clin. Diagnostic Res.*, 2016, doi: 10.7860/JCDR/2016/20873.8831.
- [3] H. B. Sharma, S. Gandhi, K. K. Meitei, J. Dvivedi, and S. Dvivedi, "Anthropometric basis of vertical jump performance: A study in young Indian national players," *J. Clin. Diagnostic Res.*, 2017, doi: 10.7860/JCDR/2017/23497.9290.
- [4] B. Hanjabam and J. Kailashiya, "Gender difference in fatigue index and its related physiology," *Indian J. Physiol. Pharmacol.*, 2015.
- [5] A. Sharma, M. Seth, and S. Koley, "Profile of injuries in Indian elite male field hockey players in relation to playing positions," *Sport. Med. J. / Med. Sport.*, 2012.
- [6] H. B. Sharma and J. Kailashiya, "Effects of 6-week sprint-strength and agility training on body composition, cardiovascular, and physiological parameters of male field hockey players," *J. Strength Cond. Res.*, 2018, doi: 10.1519/jsc.0000000000002212.
- [7] A. De, "Sporting with gender: Examining sport and belonging at home and in the diaspora through Patiala House & Chak De! India," *South Asian Pop. Cult.*, 2013, doi: 10.1080/14746689.2013.820476.
- [8] I. Hussain, S. Ahmed, and S. Khan, "Biomechanical Study on Drag Flick in Field Hockey," *Int. J. Behav. Soc. Mov. Sci. Int. J. Behav. Soc. Mov. Sci.*, 2012.
- [9] T.-G. Kim, J.-H. Cha, and J.-C. Park, "Association between in-game Performance Parameters Recorded via Global Positioning System and Sports Injuries to the Lower Extremities in Elite Female Field Hockey Players," *Indian J. Sci. Technol.*, 2016, doi: 10.17485/ijst/2016/v9i43/105031.
- [10] J. F. Chen, A. Yang, X. Zhou, and L. Yan, "Research of the college coaches evaluation index system based on the fuzzy comprehensive evaluation model," *Biotechnol. An Indian J.*, 2014.