Renewal of Sport Science in Sports Field

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Recently, as with all academic fields, various changes are required in the scientific approach and utilization of sports fields. Sports science must take an active interest in meeting the needs of the sports field because its practical application value is emphasized despite the gap between the laboratory and the field being more noticeable than in any other academic field. The international genesis of sports science can be seen before and after the 1964 Tokyo Olympics, and the 1988 Seoul Olympics brought about new changes in domestic sports science. Among the projects attempted after the Seoul Olympics were confirmed to be held in Baden-Baden, Germany in 1981, the representative project related to sports science was the 1988 Olympic Dream Tree Discovery Project. Compared to now, it was a policy-oriented program with insufficient theoretical support, but it was the first attempt to introduce a scientific background. However, even when the 1988 Seoul Olympics were held, the leader’s experience and traditional fighting spirit were still emphasized rather than sports science, and coordination between the sports field and the laboratory at that time was very difficult. Of course, since the information and programs corresponding to the software that the researchers in the laboratory at that time covered only in limited areas, it was not possible to provide a clear answer for the sports field, and the active introduction of sports science to improve performance in the sports field was not easy. Archery can be cited as one of the sports that most actively tried to incorporate sports science and create a new system at the time, and these efforts could have been one of the very important factors in helping Korea become an archery kingdom today.

Since the 1988 Seoul Olympics, the field application of sports science has progressed in various directions, and as the most foundational project, scientific methods have been attempted to discover sports gifted students with excellent abilities. The field application of sports science has continued in the form of excellent player discovery projects, candidate player support projects, and the establishment of sports talent development foundations to expand the base while discovering young people with potential. The field application of sports science to improve performance has been centered around the efforts of Korea Institute of Sport Science, and the application of sports science for local athletes has been achieved through the establishment of sports science centers in each region, which has been attempted since 2015 [1]. In addition, what helped in the process of attempting a scientific approach to the sports field was the application of information related to cutting-edge science obtained from professional teams’ overseas training or exchanges with advanced overseas systems. Looking at recent major changes,
the demand for scientific application methods in sports fields is increasing. In order to meet these demands, the research field centered on laboratories is becoming more active, and in the process of developing new methods, convergence with other fields and methods receiving help from cutting-edge science have been used. In addition, cutting-edge science has shown its own interest in the field of sports science [2]. A representative change that appears in the process of sports science's efforts to be reborn is that the movement of coaches and athletes to use scientific information is becoming more evident. Some teams and sports organizations are actively seeking to utilize the help of personnel with sports science information in their training systems. Some famous professional athletes personally tried to establish a system to utilize sports science-related information.

Looking at programs for the practical use of sports science in sports fields, the items and methods of physical fitness measurement are being applied in more specific and practical ways, and the use of the results needs to be presented in a more diverse manner. In the case of a scientific program to improve physical fitness, the results of measuring the athlete's physical fitness level are provided to the athlete and improved during the training process. Methods are used in which measurement items or methods more effectively reflect the uniqueness of each individual athlete or sport event, and the results are presented in ways that can be used directly in the training process. Unlike in the past, measurement and analysis are being attempted to identify more specific determinants or detailed causes and treatment methods of performance or athletic ability during the actual game performance or movement process of players or coaches. Looking at a representative example, the results of the vertical jump analyzed using the force platform, which is a representative analysis equipment in biomechanics, are not only an analysis of simple jumping ability or power ability, but also an analysis of the athlete's detailed ability to demonstrate force and velocity, analysis methods that can be used to predict the structural defects of the body, focusing on the knee, and the possibility of injury based on these are being presented [3].

Academic approaches such as sports physiology, training theory, and biomechanics are becoming more sophisticated in their efforts to analyze specific factors that directly affect the improvement of physical fitness and skills, and require that they be actually usable in sports settings. In the case of sports psychology, it starts with basic methods such as observation, research and survey methods, and interview methods, and uses cutting-edge equipment to find specific causes such as anxiety, tension, and stress. Based on these results, efforts are being made to find possible treatment methods through real-time feedback [4]. In addition, the sports nutrition approach focuses on developing specific programs that take into account individual differences, detailed events, and situations while comprehensively considering the intake components and intake of nutrients as well as the timing of intake [5]. However, above all, the most representative characteristic that appears in the recent application process of sports science is the growing movement to find creative and changeable methods beyond the existing framework. Medicine and other related sciences have long been pursing basic clinical guidelines, systematic reviews, advanced technologies, and qualitative evaluations along with efforts to find evidence-based principles. Therefore, attempts are being made to analyze evidence-based systemization and diversification of sports science for future-oriented health promotion. The process is underway to collect questions and answers from actual clinical sites and apply the results to the clinical process. Sports science for health promotion is developing a digital healthcare system based on big data and artificial intelligence. In addition, an active program based on a cutting-edge system that integrates 3D printing, virtual augmented reality, intelligent robots, and genetic rehabilitation treatment techniques is required [6].

To summarize the evolving changes in sports science, the demand in the sports field for scientific utilization methods is becoming more active, and to meet this, the development of new methods is being actively attempted based on cutting-edge science and convergence of other fields. In particular, in this process, there is a noticeable movement to utilize specialized technologies, including AI, in the field, and individualized conditioning plans that take into account the uniqueness and detailed circumstances of each player are
being utilized. In addition, the trend of new industrialization based on sports science is being activated, and digital smartization is being attempted through the convergence and cutting-edge of various sports science factors.

References