ORIGINAL RESEARCH

Prevalence of performance enhancing substance use among elite football players in two super league teams in Blantyre, Malawi

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Abstract

Background

Use of performance enhancing substances (PES) is common among athletes with a worldwide prevalence ranging from 5% to 31%. There has been little knowledge of PES use in African athletes with no available data for Malawian football players. This study aimed to determine the prevalence of PESs use among elite football players in two super league teams in Blantyre, Malawi.

Methods

This was a cross-sectional study conducted in two super league football teams in Blantyre, Malawi. A modified standard questionnaire obtained from the World Anti-Doping Agency (WADA) Social science research package was administered to collect data from a convenient sample of 43 elite football players on the characteristics of participants, prevalence of PESs use and reasons for using PES. Data were analysed using descriptive statistics and Chi-square test.

Results

Out of 86 eligible football players, 43 with a mean age of 24 ± 4 years participated in the study. Many players (60%) had secondary education as their highest level of education and most players (86%) had played football for more than five years. Out of 43 participants, 39 (91%) had been using PESs while four (9%) had never used PESs. Out of 13 substances, caffeine (77%), herbal products (40%), and energy bars (40%) were the commonly used PESs while cocaine (2%) was the least used substance among the players. Improving performance was the most common reason (81%) why participants were using PESs followed by increase in lean body mass (35%).

Conclusion

The prevalence of PESs use among elite football players in two super league teams in Blantyre, Malawi is high. The most used PES are caffeine, herbal products and energy bars. Participants mainly use PESs for improved performance in football. Therefore, awareness among elite football athletes and stakeholders on adverse health effects of PES use should be promoted.

Key words: Prevalence, Performance enhancing substance, elite athletes, Doping, Football.

Introduction

Sport participants aim at increasing their performance with each subsequent period of their game. In their preparations, they use different strategies for improving their performance to increase their winning chances[1]. Some individuals modify their training during preparations while others use Performance Enhancing Substances (PESs) to achieve the same goal[1]. PESs are those substances that are used to improve the execution of activities especially in sports by objectively or subjectively aiding performance[2]. Due to their accrued benefits in improving sports performance through relieving pain, combating fatigue, increasing strength, increasing muscle mass, increasing endurance, enhancing recovery to injury and reducing or increasing weight; PESs have been preferred by athletes for decades[3]. Among the many PESs, some are prohibited by the World Anti-Doping Agency (WADA) due to their detrimental effects on the athletes' health as well as infringing on the principle of fair play which entails ethical pursuit of human excellence through dedicated perfection of each athlete's natural talents[4]. For instance, substances such as anabolic androgenic steroids, peptide hormones, growth factors, Beta-2 agonists, diuretics and masking agents are all prohibited by WADA at all times[5]. However, other substances such as stimulants, narcotics, cannabinoids and glucocorticoids are prohibited during competition with beta-blockers prohibited in particular sports[5].

Despite being a prohibited practice, PESs use by elite sports athletes is prevalent worldwide[6]. Prevalence rates of 14% to 39% of prohibited PESs use in elite sports have been reported worldwide with variations in different types of PESs as well as levels of sports among different nationalities[7]. While a global prevalence of 0.45% in PES use has been reported among elite football athletes[7], studies in Africa have largely reported prevalence rates of doping among amateur football athletes[8,9]. For example, a prevalence of 3.8% in PES use among Ghanaian high school football athletes was revealed[9], whereas PES use among amateur football athletes in Cameron was reported to be 8%[8]. Although there are

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variations in PES use attributed to geographical location and parameters of focus[10], there seems to be lack of data on prevalence of PES use among Malawian elite football athletes.

Most used PESs by elite sports athletes of various sporting activities include anabolic androgenic steroids (AAS), human growth hormones, erythropoietin, nutrition supplements, caffeine, amphetamines and gene doping[3,11]. Some benefits in sports performance associated with PESs use include stimulating the nervous system (caffeine and amphetamines) leading to athletes focus and concentration as well as enhancing resistance training responsiveness (AAS and human growth hormones) thereby improving athlete's strength and endurance[12]. In some other instances, the fame and respect attached to successful athletes as well as the demand for high performance from coaches has led to some athletes indulging in PESs use in order to succeed[3].

Although PESs may aid performance, they are associated with adverse effects that may be detrimental to athletes[2]. Among many other effects, use of creatinine to enhance performance in athletes has been associated with acute kidney injury[13]. Serious adverse effects of use of anabolic androgen steroids among athletes include; variations in sperm characteristics, a reduction in the volume of testicles and gynecomastia in men as well as irregularities in menstruation and clitoromegaly in women[14]. In both sexes, anabolic steroids have been associated with fertility problems[14]. In addition, use of erythropoietin among athletes increases blood viscosity which may lead to thromboembolic events[15]. Beside increases in blood viscosity, long term use of erythropoietin may lead to red blood cell aplasia and consequently heart failure[15]. Despite available information on medical consequences of PESs [16], its use still persists among many athletes. The scarcity of data on PESs use among football players in Malawi threatens compliance to the World Anti-Doping Code, fair-play and the spirit of olympism. Anecdotal evidence from the Malawi Anti-Doping Organisation (MADO) indicate that less than ten laboratory tests to determine doping violations in Malawian elite footballers have been performed in the past few years (Kanjala O 2022, Oral Communication, 19th February). This could suggest that the scarcity of data on doping among Malawian football athletes could be due to limitations in testing coupled with the rarity of quality research studies on the subject, and not due to the absence of doping cases. The recent skyward trend in attention accorded anti-doping efforts in Malawi suggests that doping among Malawian athletes exists[17]. Despite evidence that the prevalence of prohibited PESs use varies among different sports and nationalities[18], there has been minimum effort to investigate the prevalence of PESs use among elite football players in Malawi. The aim of this study therefore was to investigate the prevalence and reasons of PES use among elite football players, in Blantyre, Malawi.

Methods

Study design

This was a cross sectional study involving 43 elite football players above 18 years old.

Study setting

This study was conducted in two elite football teams in Blantyre, Malawi. The two teams were among the three elite football teams based in Blantyre city playing in the Telecom Networks Malawi (TNM) super league.

Recruitment of study participants

All the three football teams playing in the TNM super league in Blantyre city were conveniently selected to participate in the study. The TNM super league is the highest league in the country with only three football teams from Blantyre playing in the league. The three TNM super league teams from Blantyre are among the top performing teams of the league. Team officials from the three teams were contacted by the researchers for permission to participate in the study.

All football players in the three team (n = 86) were eligible to participate in the study. Two of the teams had 30 football players each while the other team had 26 football players. Only two teams with a total of 56 players consented to participate in the study. Within the two teams that consented to participate, 13 players were excluded (12 were on holiday while 1 denied consent to participate) whereas 43 players consented to participate in the study. Data were collected in March, 2020.

Data collection and tools

Trained research assistants collected data from participants using a modified researcher administered Anti-doping questionnaire from the World Anti-doping Agency (WADA) social science research package for anti-doping organisations[19]. All questions in the modules of the WADA research package have been used in Anti-Doping research and all multiple item scales have established validity and reliability[19]. The questionnaire comprised 10 close-ended questions structured into two sections. The first section comprised information on demographic characteristics of participants such as age, education, duration of playing football, highest level of competition and highest title held. The second section comprised information on the use of performance enhancing drugs as well as reasons for using the performance enhancing drugs. The random response technique was used while obtaining data to obtain accurate responses from the participants. The questionnaire was piloted on a sample of 10 elite football players before use and revisions were done where necessary. Results of the pilot questionnaire were not included in the results of this study.

Data analysis

Data were analysed using IBM Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics using mean and standard deviation (SD), frequencies and percentages were used to describe all data variables. Chi-square test was used to analyse differences in sporting experiences and PES use between the two teams. All statistical tests were two sided and p values of ≤ 0.05 were considered statistically significant.

Ethics approval and consent to participate

As participants came for training at their various football clubs, they were requested to attend a talk by the researchers regarding the study and requesting their participation. Willing participants were directed into a separate room where the aim and objectives of the study were explained and screening for eligibility was done.

Consent was obtained from eligible and willing participants. All ethical procedures were followed and privacy and confidentiality were ensured by allocating codes to the participants. The study was approved by the University of Malawi's College of Medicine Research and Ethics Committee (COMREC) registration number U.10/19/2832.

Results

Demographic characteristics

Out of a population of 86 elite football players, 43 participated in the study. The mean age of the participants was 24 ± 4 years with 26 (60%) players having secondary education as their highest level of education.

Table 1: Characteristics of participants

Characteristics	n (%)
Age	(24 ± 4)*
Education level	
Secondary	26 (60)
Tertiary	17 (40)
Duration in football	
Less than one year or season	1 (2)
One or two years or seasons	2 (5)
More than two but less than five years or seasons	3 (7)
Five or more years or seasons	37 (86)
Highest level of competition	
National competitions	8 (19)
International competitions	35 (81)
Highest title held	
City title	1 (2)
Regional title	3 (7)
National title	27 (62)
International title	12 (27)
Dope testing status in the past 12 months	
Yes	3 (7)
No	37 (86)

* = Mean ± Standard deviation

Table 2: Prevalence of PESs use

Performance Enhancing Substance (PES)	n (%)
Use of any PES	
Yes	39 (91)
No	4 (9)
Use of various PES	
Caffeine	33 (37)
Herbal products	17 (40)
Energy bars	17 (40)
Tetrahydrocannabinol (THC)	15 (35)
Creatine	11 (26)
Anabolic androgen steroids	11 (26)
Vitamins or mineral supplements	9 (21)
Erythropoietin (EPO)	9 (21)
Tetrahydrogestrinone (THG)	9 (21)
Diuretics	9 (21)
Human growth hormone (hGH)	9 (21)
Beta-blockers	8 (19)
Cocaine	1 (2)

Most players (37 [86%]) had played football for more than five years followed by those who had been playing football for more than two years but less than five years (3 [7%]). Only one football player had been playing football for less than one year.

Table 3: Differences in sporting experiences and prevalence of PES use between the two teams

	Total (n = 43)	Team 1 (n = 25)	Team 2 (n = 18)	Chi-Square value	P Valu
Sporting years					
Less than 1 year (n [%])	1 (2)	0 (0)	1 (6)		
More than 1 year (n [%])	42 (98)	25 (100)	17 (94)	1.42	0.23
Sporting level					
International (n [%])	35 (81)	21 (84)	14 (78)		
National (n [%])	8 (19)	4 (16)	4 (22)	0.27	0.61
Therapeutic drug exemption					
Yes (n [%])	7 (16)	5 (20)	2 (11)		
No (n [%])	36 (84)	20 (80)	16 (89)	0.61	0.44
PES use					
Yes (n [%])	39 (91)	22 (88)	17 (94)		
No (n ([%])	4 (9)	3 (12)	1 (6)	0.52	0.47

Out of all the 43 players, 35 (81%) had their highest level of football competition at international events while 8 (19%) had only competed at the national level. Most athletes (37 [87%]) had not done any performance enhancing drug test for a period of 12 months (Table 1).

Prevalence of PES use

Out of 43 participants, 39 (91%) had been using PESs while only four (9%) had never used PESs. Out of 13 substances, caffeine was the most common PES used by football athletes while cocaine was the least used substance (Table 2). There were no significant differences in sporting experiences and prevalence of PES use among players from the two football teams (Table 3).

Reasons for PES use

Improving performance was the most common reason (35 [81%]) why participants were using PES followed by increase in lean body mass (15 [35%]), reducing body weight (10 [23%]) and stimulating quick recovery from injury (5 [12%]) respectively. Muscle relaxation (1 [2%]) was the least reason why participants used PESs.

Discussion

The main purpose of the study was to evaluate the prevalence of performance enhancing substances use among elite football players in two super league teams in Malawi. Results reveal a higher prevalence of overall use of PES among elite football players in Blantyre, Malawi. Considering prohibited PES such as Anabolic–Androgenic Steroids (AAS), human growth hormone, erythropoietin, amphetamines and stimulants, our findings are similar to a number of studies that reveal a prevalence range from 3% to 31% among sports athletes[10,20,21]. However, compared to our findings, some studies within the sub Saharan region have reported lower prevalence rates of use for some prohibited PES[9,22]. For example, contrary to a prevalence of 26% revealed in our study, a prevalence of 3.8 % in Ghana[9] and 4% in South Africa[22] in using AAS has been reported. Similarly, a prevalence of 5% in using growth hormone was reported among Johannesburg high school athletes[23] compared to 21% revealed in the current study. While these African studies reporting a lower prevalence in use of AAS recruited amateur athletes[9,22], our study participants were elite football athletes playing in the highest league in Malawi. As such a slightly higher prevalence in use of AAS could be expected due to pressure for high performance among elite football athletes. Although it is acceptable that unattainable performance with normal physiology could be induced by banned substances, peak performance can be enhanced through ethical means

without incurring health risks resulting from drug use[22].

Use of non-prohibited PES was found to be high in the current study. In line with one previous study[23], prevalence in use of caffeine was found to be high among football athletes. In Malawi, Caffeine is an easily accessible substance mostly consumed as a beverage as opposed to other substances such as cocaine which are prohibited by law. Considering that some non-prohibited PES such as caffeine may be ingested without limitation through other foods and medication, their prevalence may likely be higher among football athletes. On the other hand, one report[24] reveal a lower prevalence in use of herbal products among football athletes compared to our findings. Since PESs use might be enhanced by environmental factors such as access[25] and exposure, substances found outside the neighbourhood, inaccessible and unknown to Malawian elite football athletes may not be highly used.

In line with other previous studies[26,27], findings from the current study reveal that most football athletes use PESs to increase their performance. PESs may be used for high performance, to increase lean body mass, reduce body weight and stimulate quick recovery from injury[3]. Although some reports indicate peer pressure as another reason why athletes use PES[27], none of the participants in our study reported this as a reason for using PESs. As revealed by other investigations[28], a small proportion of elite football athletes in the two football teams in the current study use PESs to stimulate a quick recovery.

Being the first, this study provides valuable information on the prevalence of performance enhancing substances among elite football players in Malawi. The study also adds to the body of knowledge on common PESs used by elite football athletes in resource limited settings such as Malawi. However, despite revealing a high prevalence in PESs use among elite football players, findings of the study were based on a small sample size which may reduce generalizability of the results to all elite football players in Malawi. In addition, data for the study was collected through a researcher administered questionnaire which may result in human bias. Further, the study did not focus on prohibited PESs use among the participants which gives only a general evaluation of PES use. Therefore, future studies among elite football players should focus on prohibited PESs while incorporating a larger sample size and objective methods of determining the prevalence of PES use such as laboratory based chemical analysis.

Conclusion

There is a high prevalence of PES use among elite football players in two super league teams in Blantyre, Malawi. Caffeine, herbal products, and energy bars are the commonly used PESs while cocaine is the least used substance among the players. Participants mainly use PESs for improved performance in football. Therefore, awareness among elite football athletes and stakeholders on adverse health effects of PES use should be promoted.

Author contributions

EC made substantial contributions to the conception, design of the work and drafted the work. DU, SU, SN and MM collected data and revised the work critically for important intellectual content. All authors are in agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of interest

The authors state no conflicts of interest in this research or for the development of the manuscript. This manuscript is original and not previously published.

Data Availability

Data for the study cannot be shared publicly because the data contains potentially identifying information. The restriction has been imposed by the College of Medicine Ethics Committee (COMREC), an IRB that approved the study. Data are available from COMREC (Email: comrec@medcol.mw) for researchers who meet the criteria for access to confidential data.

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