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ATTENTION DEFICIT HYPERACTIVITY DISORDER IN ATHLETIC POPULATION

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ABSTRACT: Objective: Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder with heterogeneous expression affecting quality of life. The incidence of ADHD may be increased among athletes who participate at the elite level. A surprising number of professional athletes have attention deficit disorder (ADHD). In fact, an estimated eight to ten percent of all pro athletes have the condition, as compared to four to five percent of the general population of adults. In the present study we evaluated ADHD symptoms in athletes who participate at the elite level. we hypothesized that ADHD symptoms would be more closely related to sport behavior. METHODS: This was a descriptive -analytical study of 63 sportsmen that participating in Olympic competition at the elite level. They completed Persian Adult ADHD Rating Scales-self-report (CAARS-S-SV). We divided them to two groups (active and inactive sportsmen). We compared ADHD symptom in 63 sportsmen with 50 subjects of scientific Olympiad and 221 students without history of sport competition. RESULTS: The comparison among four groups of this study in mean age did not show statistically significant difference (F = 2.14, P = 0.52). The data showed that four groups in our study did not differ statistically significant on demographic parameters (age, gender, and Marital status) (P> 0.05). The results of ANOVA tests for comparison among four groups (active sportsmen, inactive sportsmen, Olympiad and non-sportsmen) show that significant difference on inattention (F= 5.911, df3,330 , sig=0.001), hyperactivity (F= 6.895, df3,330 , sig=0.0001), and ADHD index (F= 12.239, df3,330 , sig=0.0001), were existed. Conclusion: There were statistically significant differences in mean inattention, hyperactivity and ADHD index score in above four groups.
Keywords: ADHD- Athlete- Adult- Elite-Sport.

INTRODUCTION

Sport psychiatry focuses on diagnosis and treatment of psychiatric illness in athletes in addition to utilization of psychological approaches to enhance performance. The relationship between an athlete and his or her psychiatric disorder can take many forms.As this field and its research base are relatively new, clinicians often deliver psychiatric care to athletes without a full understanding of the diagnostic and therapeutic issues unique to this population. There have been several studies looking at the prevalence of some psychiatric disorders in various athlete populations.(1,2)

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder with heterogeneous expression affecting quality of life. The incidence of ADHD may be increased among athletes who participate at the elite level. In some circumstances, the symptoms and signs of ADHD may offer an advantage. The ability to act without reflection (impulsivity) could offer advantages in responding to danger. The incidence ADHD in athletes may be slightly higher than in the general population. Many exceptional athletes have ADHD, in some circumstances, the symptoms and signs of ADHD may offer an advantage. Impulsivity may equate with

spontaneity and quick decision making. Many athletes report the ability to hyper focus on enjoyable activities. According to unpublished observation in Texas A&M University in College Station, the total number of athletes with ADHD was 7% to 9%. (3)

Many athletes report the ability to hyper focus on enjoyable activities. They are able to block out distractions and focus on the competitive event, as shown by Michael Phelps, the multiple Olympic gold medal winning swimmers, who has ADHD. A surprising number of professional athletes have attention deficit disorder (ADHD). In fact, an estimated eight to ten percent of all pro athletes have the condition, as compared to four to five percent of the general population of adults.(4)

Eric Morse, M.D., president of the International Society for Sports Psychiatry says "A lot of athletes have ADD and don't know it,". Among the athletes who do know that they have ADD, few are open about it. "They're often scared of what it could do to their career. In sports, no one wants to admit to a weakness."

Despite the risks, a growing number of athletes have come forward to acknowledge that they have the condition - including Terry Bradshaw,(the Pro Football Hall of Famer who quarterbacked the Pittsburgh Steelers to four Super Bowl victories in the 1970s); swimmer Michael Phelps,(the first American to win eight medals in a single Olympic Games); Pete Rose, (whose ADD probably helped propel him to become the 1975 World Series MVP and to hold the major league all-time hit record .)

Justin Gatlin (capture the gold medal in the 2004 Olympic Games in Athens), Cammi Granato (scored more goals than any other player in the history of U.S. women's hockey). (4)

The world prevalence of ADHD is (4.4 % or 5.3%) in different studies(5,6), however, there are no ADHD prevalence studies in sports. One paper addresses ADHD in a boys' gymnastics team. (7)

John Heil et al, in a survey with 870 interscholastic athletes showed that the percentage of ADHD in the six sport was 4.4 % for track and 17.5% for football.(8)

Two papers have specifically addressed the problem of ADHD and sport. A good review by Hickey and Fricker examined the diagnosis and treatment of ADHD, especially as it relates to sport and the use of stimulants.(9,10)

In the present study we evaluated ADHD symptoms in athletes who participate at the elite level. We hypothesized that ADHD symptoms would be more closely related to sport behavior.

METHODS

This was a descriptive -analytical study of 63 sportsmen that participating in Olympic competition at the elite level. The participants were 32male and 31 female athletes with mean age 23.95 (SD=7.32), and they competed in wrestling, taekwando, swimming , cycling, canoe, vollyball, track ,and chess. We divided them into two groups (active and inactive sportsmen) and compared ADHD symptom in 63 sportsmen with 50 subjects of scientific Olympiad and 221 students without history of sport competition.

In this study, active sportsmen included 12 cases wrestling,2 cases taekwondo, 2 cases swimming ,1cases cycling, 3 cases canoe ,2cases volleyball, 1 case track,and 40 subject in chess that being place at inactive group. We compared them with 221 students and 50 subjects of scientific Olympiad with same age and sex without history of sport competition.

Informed consent was obtained from all participants and the investigation was conducted in accordance with ethical research guidelines. For evaluation of ADHD symptoms , they completed Persian Adult ADHD Rating Scales-self-report (CAARS-S-SV). This test (CAARS-S-SV) consists of 30 items and evaluated three factor included inattention, hyperactivity-impulsivity and ADHD index and rate symptoms on a Likert scale from 0 (not at all/never) to 3 (very much / very frequently).

Cranach Alfa was 0.74 for inattention scale, 0.68 for hyperactivity- impulsivity scale and 0.81 for ADHD index. (11)

For data analysis, both descriptive and inferential statistics were used. Considering the design of research, a ANOVA test and POST HOC Tukey HSD analysis method has been applied and data were analyzed using SPSS-19 software application. The significance level of findings was considered equal to (P> 0.05).

RESULTS

Socio demographic characteristics of individual in this study has shown in table 1. As a result, mean age of athletes in the present study were 23.95 (SD=7.32) in active and 22.78 (SD=7.32) in inactive sportsmen.

Table1 indicated that sportsmen and non-sportsmen groups did not differ statistically significant on demographic parameters (age, gender and Marital status) (P> 0.05).

The comparisons among four groups of this study in mean age,gender and marital status did not show statistically significant difference respectively (F = 2.14, P = 0.52), (F = 2.58, P = 0.08), (F = 2.26, P = 0.10).

Table 1: Socio demographic characteristics of the sample

Variables	Active sportsmen (n=23)	inactive sportsmen (n=40)	Olympiad (n=50)	Non-sportsmen (n=221)	Statistic (P value)
		Mean(SD)			
Age	23.95 (7.32)	22.78 (5.45)	22.52 (4.32)	23.66 (3.53)	T= 2.14 (0.52)
Gender		*Count (%)*			
Male	15 (65%)	17 (42%)	30 (60%)	110 (41%)	
Female	8 (35%)	23 (56%)	20 (40%)	111 (59%)	X2 = 2.58 0.08
Marital status		*Count (%)*			
Never married	19 (83%)	38 (95%)	45 (90%)	203 (95%)	X2 = 2.26 0.10
Married	4 (17%)	2 (5%)	5 (10%)	11 (5%)	
		Sig* < 0.05			

Means and standard deviations for inattention, hyperactivity and ADHD index scales of (CAARS–S: SV) in the sample groups are shown in Table 2.

Table 2: Means and standard deviations for Inattention, Hyperactivity and ADHD index scales of (CAARS–S: SV) in the sample groups

Group	N number	Variables		
		Inattention	Hyperactivity	ADHD index
		Mean(SD)	Mean(SD)	Mean(SD)
Active-sportsmen	23	6.30(4.38)	7.91(3.89)	10.78(4.62)
Inactive-sportsmen	40	6.55(3.75)	6.12(3.21)	9.85(4.48)
Olympiad	50	9.81(4.38)	9.37(3.76)	15.63(6.03)
Non-sportsmen	221	7.44(4.41)	7.14(3.71)	10.97(5.34)

The results of ANOVA tests for comparison among four groups (active sportsmen, inactive sportsmen, Olympiad and non-sportsmen) show that significant difference on inattention (F= 5.911, df3,330 , sig=0.001), hyperactivity (F= 6.895, df3,330 , sig=0.0001) and ADHD index (F= 12.239, df3,330 , sig=0.0001) are existed (table 3).

Table 3: Results of ANOVA tests for comparison means for inattention, hyperactivity and ADHD index scales of (CAARS–S: SV) among four groups

variable	Source variance	Sum of Squares	df	Mean Square	F	Sig.
inattention	Between Groups	332.874	3	110.958	5.911	.001
	Within Groups	6194.374	330	18.771		
	Total	6527.248	333			

hyperactivity	Between Groups	279.551	3	93.184	6.895	.000
	Within Groups	4459.802	330	13.515		
	Total	4739.353	333			
ADHD index	Between Groups	1035.838	3	345.279	12.239	.000
	Within Groups	9310.048	330	28.212		
	Total	10345.886	333			

The pair wise comparisons (Post Hoc) Tukey HSD among four groups indicated that there were statistically significant differences in mean inattention, hyperactivity and ADHD index score that are shown in table 4.

Table 4: Pair wise comparisons (POST HOC) Tukey HSD

variable	Groups	Comparison	Mean Difference	Std. Error	Sig
inattention	active-sportsmen	Inactive-sportsmen	-.24721	1.13375	.996
		Olympiad	-3.50873	1.09158	.008**
		Non-sportsmen	-1.13845	.94924	.628
	Inactive-sportsmen	Olympiad	-3.26152	.91907	.002**
		Non-sportsmen	-.89124	.74445	.629
	Olympiad	Non-sportsmen	2.37028	.67849	.003**
Hyperactive	active-sportsmen	Inactive-sportsmen	1.79050	.96200	.247
		Olympiad	-1.45697	.92622	.395
		Non-sportsmen	.76656	.80544	.777
	Inactive-sportsmen	Olympiad	-3.24747	.77984	.0001**
		Non-sportsmen	-1.02395	.63168	.368
	Olympiad	Non-sportsmen	2.22353	.57571	.001**
ADHD index	active-sportsmen	Inactive-sportsmen	.93089	1.38994	.908
		Olympiad	-4.84694	1.33823	.002**
		Non-sportsmen	-.18438	1.16373	.999
	Inactive-sportsmen	Olympiad	-5.77782	1.12674	.0001**
		Non-sportsmen	-1.11526	.91267	.613
	Olympiad	Non-sportsmen	4.66256	.83181	.0001**

Sig** < 0.01 , Sig* < 0.05

Results of the research also show that in inattention variable, olympiad group has more inattention than other groups respectively, active sportsman (mean different = 3.51, sig = 0.008), inactive sportsmen (mean different = 3.26, sig = 0.002), non sportsmen (mean different = 2.37, sig = 0.003). On the other hand,we did not observed specific difference between sportsmen and non sportsmen ,but in comparison with scientific olympiade have less inattention.

Our study indicated that the type of sport (active or inactive) have not effect on inattention or hyperactivity or ADHD index in athletes. Also,in hyperactivity variable, olympiad group has more hyperactivity than inactive sportsmen group(mean different = 3.24, sig = 0.0001) and non sportsmen group (mean different = 2.22, sig =

0.001).Whereas ,active and inactive sportsmen were not different in this scale,but inactive sportsmen(chess) show less hyperactivity than olympiad group.

In ADHD index variable, olympiad group has more ADHD index than active sportsmen group(mean different = 4.48, sig = 0.002), in active sportsmen group (mean different = 5.77, sig = 0.0001) and non sportsmen group (mean different = 4.66, sig = 0.0001).

In other words,we did not observed specific difference between sportsmen and non sportsmen ,but in comparison with scientific olympiad have less ADHD index.

DISCUSSION

Our study indicated that ADHD symptoms not to be more prevalent in the athletes. There were statistically significant difference in mean inattention, hyperactivity and ADHD index score in above-mentioned four groups in our study.

ADHD is a relatively widespread condition most prominent in adolescents with onset typically in childhood and with effects often extending into adulthood. Though the effects in the classroom have been extensively studied, little study has been done in the sports setting.

A surprisingly large ADHD prevalence is reported in one boys' gymnastic team, that is not in line with our results. (6)

The research literature on psychiatric issues in athletes remains surprisingly limited.Mental health issues may not always be noticed or addressed appropriately by athletic staff. One reason is that athletes may minimize any apparent signs of perceived weakness.(2)

Athletes training at the highest level may be more injury or over –training and may be much more vulnerable to stress and depression.(12)

Even mild depression and anxiety in a professional or elite athlete can significantly impair performance (13).The challenges of treating the elite athlete are great, but successful treatment is possible (14). With treatment they may be able to focus better on a specific task, and may be more aware of position and time.(15)

Further studies are needed to evaluate the unique experiences facing athletes with any of psychiatry disorders such as ADHD. Specific guidelines are needed to all sporting bodies to help overcome these problems .

To the better application of our outcomes, the present study is the first investigation that seeks to discover the ADHD symptoms in a sample of Iranian athletes in Elite level. However, the findings of this research should be interpreted from the standpoint of a number of shortcomings. As a result of study design and sample size, the representativeness of the findings might be limited. In addition, (CAARS–S: SV) is a general scale to measure the ADHD symptoms. Therefore, this self-report scale in assessment of ADHD requires to be administrated with structured clinical interview. Therefore, future researches will disclose the greater realities.

Mental illness is a subject that most people shy away from discussing, especially athletes. Many view mental illness as a personal weakness, but it is not a sign of weakness or a personal flaw, it is a health issue that needs attention.

We think, ADHD is a challenge to competitive athletes, but with precise training performance skills can be developed and refined in a way that contributes to competitive excellence.

The sport medicine physician and sports psychiatrist can be very helpful in assisting the ADHD athlete at all developmental levels in customizing an effective treatment plan that assists the athlete experience success in all aspects of the life.

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