



**THE RELATION BETWEEN ANABOLIC ANDROGENIC STEROIDS (AASs) USE AND
THE DECREASE IN SPERM COUNT AMONG MALE ATHLETES IN DAMASCUS
SYRIA**

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ABSTRACT

The objective of this cross sectional study is to know the relation between anabolic androgenic steroids (AASs) use and the decrease in sperm count among male athletes in Damascus – Syria. Eighty athletes were included in the study. The athletes were divided into two groups, group I included 40 subjects with a history of AAS use, while group II also included 40 subjects with no history of AAS use. The study showed that 37.5% of AAS users had sperm count below the normal values (62.5% normal - 12.5% mild oligospermia - 17.5% moderate oligospermia - 7.5% severe oligospermia). This findings indicated that use of AAS can lead to a decrease in sperm count, moreover smoking cigarette, cannabis use and alcohol intake had a negative impact on sperm count.

KEYWORDS: AASs Use. Anabolic Androgenic Steroids. Sperm Count. Semen Analysis. Oligospermia. Spermatogenesis.

INTRODUCTION

Anabolic androgenic steroids are basically synthetic versions of the male hormone, they have two main effects on the human body an anabolic or muscle building effect and the androgenic or masculinizing effect. Anabolic androgenic steroids abuse became a routine thing beside training, and many athletes take AAS without caring for its side effects such as liver disease, kidney disease or even heart disease. Another serious side effect is on male reproductive function, AAS can lead to oligospermia, azoospermia, shrinking in testis, decrease in testosterone levels and serum gonadotropin.^[1] The testis secrete several male sex hormones, which are collectively called androgens, including testosterone, dihydrotestosterone, and androstenedione. Testosterone is so much more abundant than the others that one can consider it to be the primary testicular hormone. The hypothalamus releases Gonadotrophin Releasing Hormone (GnRh) which is delivered to the pituitary gland by the portal system and stimulates pituitary gland to form Luteinising Hormone (LH) that transports to the testis where the Leydig cells form testosterone from the cholesterol.^[2]

MATERIALS AND METHODES

The participants were randomly selected from 20 different fitness clubs among Damascus – Syria. Eighty athletes were included in the study, the athletes were divided into two groups, group I included 40 subjects

with a history of AAS use, while group II also included 40 subjects with no history of AAS use. n= 80 questionnaires were filled by participants between 1 – 15 Jan 2019, The questionnaire consisted of 4 sections with 39 questions, demographics n=4, habits n=9, Past medical and medication history n=19 and previous AASs use n=7.

LABORATORY ANALYSIS

All samples were obtained by masturbation, the athletes were instructed to avoid sexual activities before 2 – 7 days, The samples were analyzed at the same laboratory following the WHO guideline.

STATISTICAL ANALYSIS

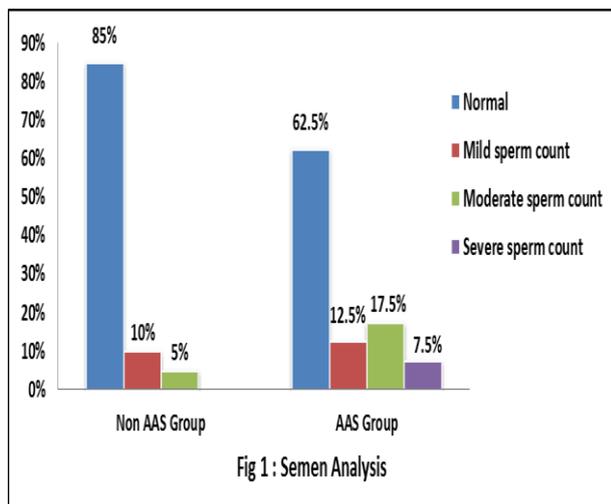
Statistical analysis was done using SPSS 25.0.

RESULTS

Participants were between the age 23 and 29 years old and they weighed 82 to 88kgs. The percentage of married athletes were 22.5% in non AAS group while 5% in AAS group. 40% of athletes in non AAS group were undergraduates and 42.5% had a bachelor's degree, while 70% of athletes in AAS group were undergraduates and 27.5% had a bachelor's degree. 15% of non AAS users were in medical field, while 77.5% of AAS users were in medical field. 2.5% of athletes had a history of cryptorchidism in each group, while 5% had varicocele in each group. Moreover 27.5% of athletes in

Non AAS group reported a previous testicular trauma, however 40% of athletes in AAS group reported a previous testicular trauma.

Athletes who smoke cigarettes were 30% in non AAS group and 70% in AAS group, while alcohol intake were 30% in non AAS group and 2.5% in non AAS group, Moreover the cannabis users were 12.5% in non AAS group and 5% in AAS group.



The Fig 1 shows the semen analysis for the participants.

-Non AAS Group : 85% of athletes had normal sperm count, while 15% had sperm count below the normal values (10% mild sperm count – 5% moderate sperm count).

-AAS Group : 62.5% of AAS users had normal sperm count, however 37.5% had sperm count below the normal values (12.5% mild sperm count – 17.5% moderate sperm count – 7.5% severe sperm count).

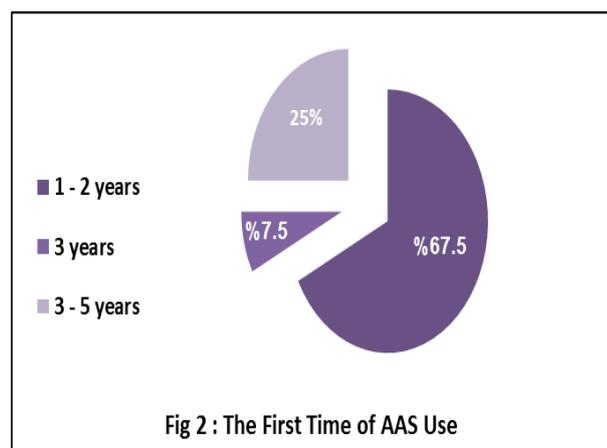


Fig 2: Shows that 7.5% of athletes started using AAS more that 3 years ago, while 67.5% started using AAS less than 2 years.

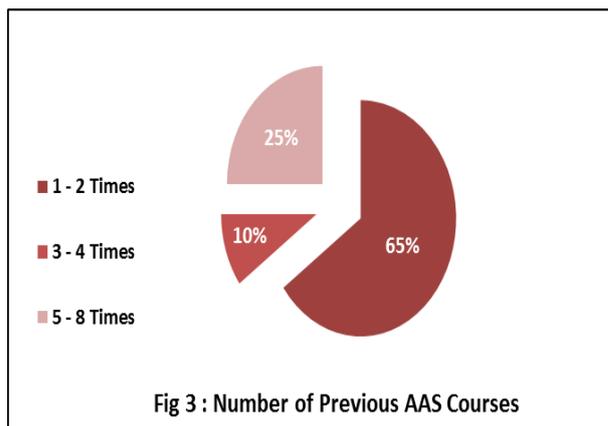


Fig 3: Shows that 65% of athletes had taken AAS more than 4 courses, while 25% had taken AAS less than 3 courses, however 10% of athletes had taken AAS between 3 – 4 courses.

17.5% of athletes who had taken previous AAS courses more than 4 times had moderate oligospermia, and 7.5% had severe oligospermia, while 12.5% of athletes who had taken previous AAS courses less than 4 courses had mild oligospermia, and 62.5% had normal values.

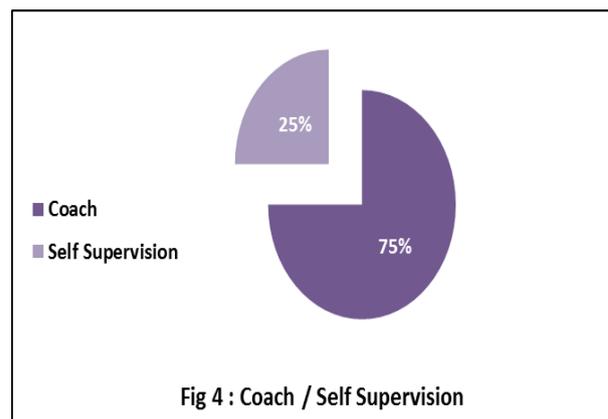


Fig 4: Shows that 75% of athletes take AAS under coach's supervision, while 25% take AAS under self supervision.

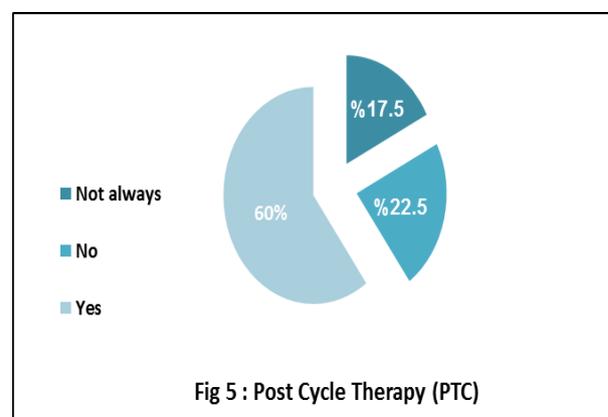


Fig 5: Shows that 60% of athletes undergo post cycle therapy (PCT), while 22.5% do not undergo post cycle therapy (PTC), however 17.5% do not always undergo post cycle therapy (PTC).

Post cycle therapy (PCT) is employed by steroid users to minimize negative health effects.

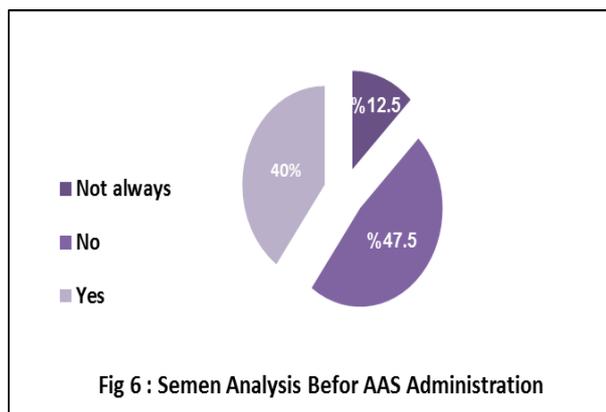


Fig 6: Shows the percentage of AAS users who do semen analysis before AAS administration: 40% of athletes said yes, while 47.5% said no, however 12.5% of athletes do not always do the analysis.

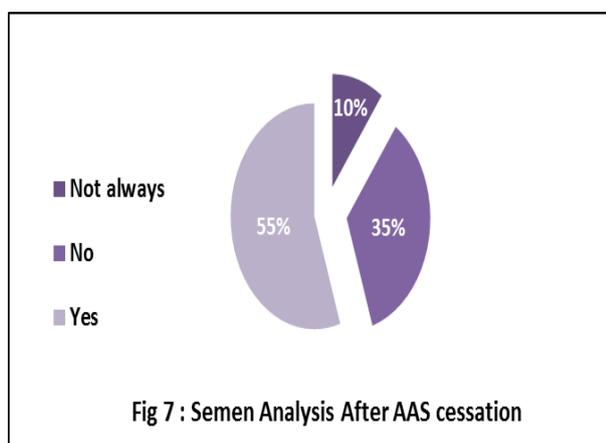


Fig 7: Shows the percentage of AAS users who do semen analysis after AAS cessation: 55% of athletes said yes, while 35% said no, however 10% of athletes do not always do the analysis.

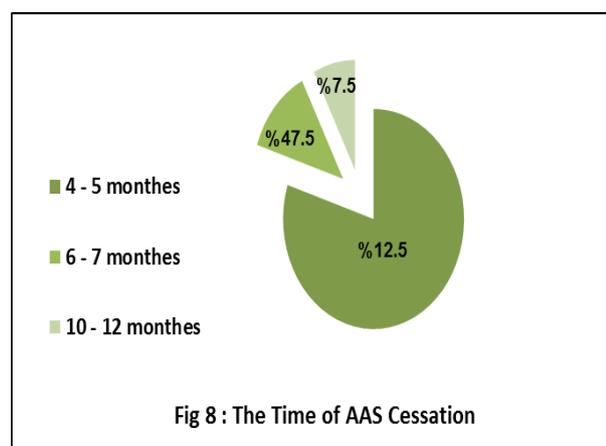


Fig 8: Shows the time of AAS cessation: 12.5% of athletes end the AAS course before 4 – 5 months, however 47.5% end the AAS course before 6 – 7 months, while 7.5% of athletes end the AAS course before 10 – 12 months.

DISCUSSION

It was found in our study that 37.5% of AAS users had sperm count below the normal values (62.5% normal - 12.5% mild oligospermia - 17.5% moderate oligospermia - 7.5% severe oligospermia).

The study showed a negative impact of AAS use on sperm count, which was similar to retrospective study that showed decrease in sperm count in AAS users group compared to non AAS users.^[3]

A similar study in 2007 suggested that AAS use inhibit the hypothalamic-pituitary axis led to negative impact on the testis volume and sperm count.^[4]

In a systematic review (33 study, 3879 participants, 1766 AAS users and 2113 non AAS users) showed reduction in testosterone serum levels while using AAS and kept decreasing even after several weeks of AAS cessation.^[5]

AAS used inhibit GnRH secretion which led to a decrease in testosterone production, decrease in spermatogenesis and testis shrinking.^[1]

Another two studies showed that AAS use led to decrease in sperm count.^[6,7]

This study showed a relation between smoking cigarettes and a decrease in sperm count below the normal values. A similar cross-sectional study showed that 19% of cigarettes smokers had decrease in sperm count compared to non smokers^[8], however another study could not find any effects of smoking cigarette on sperm parameters.^[9]

We found a statistical correlation between alcohol intake and decrease in sperm count. however, there was no negative impact of alcohol intake on sperm count in the cross-sectional study.^[9]

Our study showed that cannabis use decrease sperm count which was similar to a systematic review in 2019 suggested a relation between cannabis use and decrease in sperm count.^[10]

CONCLUSION

This study is the first of its kind in Syria and showed a relation between the use of AAS and the decrease in sperm count, and a negative impact of cigarette smoking, cannabis use and alcohol use on sperm count.

Compliance with ethical standards

- Funding: The study was not funded by any institute.
- Conflict of interest: The authors of this study have no conflict of interests regarding the publication of this article.

Ethical approval

The study design was reviewed and approved by Ethics Committee, Syrian private University.

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