

## INJECTIONS VS ORAL ANABOLIC STEROID WHICH CORRELATIONSHIP EXPLAIN THE DOPING RISKS HEALTH IN THE LEISURE ALGERIAN SPORT BODYBUILDING

BENGOUA ALI<sup>1</sup>, ZERF MOHAMMED<sup>2</sup>, MOKKEDES MOULAY IDRIS<sup>3</sup>, ATTOUTI NOUREDINE<sup>4</sup>  
& ANDRE SEABRA<sup>5</sup>

<sup>1,2,3,4</sup>Physical Education Institute Laboratory OPAPS, University of Mostaganem, Mostaganem 27000, Algeria

<sup>5</sup>Faculty of Sport, University of Porto, Portugal

### ABSTRACT

Accordingly, to the literature reviewer, the anabolic steroids evolved throughout the 1980s as public attention, where this practice is believed to increase the total anabolic steroid concentrations and their effects on the body while reducing the toxic effects on the liver and early kidney dysfunction.

Seen anabolic steroids evolved as public attention, as for our Leisure Algerian Sport Bodybuilding the purposes of this study were to expose the dangers of anabolic steroids as chemical supplies Injections or oral including as anabolic steroids in the practice of Algerian Bodybuilders that seek an increase in muscle mass.

From that, our samples are consisted from Ten Algerian amateur athletes where their homogeneity was based on ( $\geq 18$  years; 5 years of bodybuilder practice), and the volunteered participated to the experience based on the difference practice doping. Where five athletes included in their training practice injections anabolic steroids whereas other five athletes incorporated in their nutrition. As to study the relationship that explain the healthy Risks of the two practice we have chosen the Analysis of blood, [1]Measuring the ratio of urea in the blood [2]Measurement of Creatinine in the blood[3]Measure the ratio of testosterone in the blood[4]Blood glucose measurement from two month of their practice.

For that, we have chosen the analysis of T-TEST independent and correlation of the volunteer practiced to compare the implementation modification in the regulation of the vital functions.

Based on the limits of the study and results accuses in two months we confirm:

- The both practices destabilizes the regulation of vital functions
- There is a strong correlation between the two practices in all comparisons within the same test
- The great risk is in relation concentration urine & creatinine followed by the decrease in testosterone and increase of glucose.

**KEYWORDS:** Doping Anabolic Steroids Injections VS Oral, Risks, Algerian Bodybuilder

### INTRODUCTION

Historically, anti-doping efforts have focused on the detection and deterrence of doping in our elite sport. Where our journalists, recommended our leaders sport to criminalize doping in Algeria, sport. (Chafik Boukabes on behalf of Ahmed Bendifallah.Pharmaco-toxicologue, 2012)

Our aim in this study comes as educators, where we stress that doping sport has become a social problem and a public health concern. (DAVID A BARON, DAVID M MARTIN, and SAMIR ABOL MAGD, 2007) Where (Hamadou Ali Djemel Abd Nacer, 2015) confirmed its dangers in the world amateur sport and leisure Algerian Sport Bodybuilding.

The reasons for our choice of this subject is due to the miss of measures taken latest March 19, 2015 (ALGÉRIE PRESSE SERVICE, 2015) by Sports Minister Mohamed Tahmi that we are considering late. Our duty as educators we reclaimed to set background came from the reality where:

- The gyms visits in our country believe that, the training weights accompanied by greater growth, due to the increase in bio-metabolism those proteins positively condense (Mohamed Mahmoud Mandalawi, 2000, p. 95).
- Lack of information that, the available data indicates that between 40-70% of athletes use supplements, and that between 10-15% of supplements may contain prohibited substances. Such data indicates that there is a considerable risk of accidental or inadvertent doping through using supplements. Accordingly, to (Simon Outram, Bob Stewart, 2015)
- Confirmation of the literature reviewer, that their practice are believed to increase the total anabolic steroid concentrations and their effects on the body while reducing the toxic effects on the liver and early kidney dysfunction (William N. Taylor, M.D, 2002).
- The manufactured and distributed illegally of these products (Jeffrey K. Aronson, 2009).

Seen anabolic steroids evolved as public attention, as for our Leisure Algerian Sport Bodybuilding the purposes of this study were to expose the dangers of anabolic steroids as chemical supplies Injections or Oral including as anabolic steroids in the practice of Algerian Bodybuilders that seek an increase in muscle mass.

In the lack of information and program prevention in the Algerian Leisure sports. Our aims focus on preventing, Derived from the experience of the two studies" Adolescents Training and Learning to Avoid Steroids (ATLAS; Goldberg et al., 1996, 2000) and Athletes Targeting Healthy Exercise and Nutrition Alternatives (ATHENA; Elliot et al., 2004, 2008). In order To take advantage From USA Institute of Medicine Model of Prevention. (European Union, 2014)



Figure 1: USA Institute of Medicine Model of Prevention (O'Connell et al., 2009)

## METHODS

The research teams' role in this study is limited to monitoring the experience and take the measures medical planned with the agreement of the participants:

Where these tests added in the laboratory Sports Physiology of EPS Mostaganem:

### **Measuring the Ratio of Urea in the Blood**

The determination of serum blood urea nitrogen currently is the most widely used screening test for the evaluation of kidney function. The test is frequently requested along with the serum creatinine test since simultaneous determination of these two compounds appears to aid in the differential diagnosis of prerenal, renal and post renal hyper uremia.

#### Reference Values

##### Males

1-17 years: 7-20 mg/dL

> or =18 years: 8-24 mg/dL

Reference values have not been established for patients who are <12 months of age.

##### Females

1-17 years: 7-20 mg/dL

> or =18 years: 6-21 mg/dL

Reference values have not been established for patients who are <12 months of age. (CA Burtis, ER Ashwood, DE Bruns, 2006)

### **Measurement of Creatinine in the Blood**

Creatinine testing requires a simple blood draw at your local lab facility. Find a visible vein. Most often, a vein on the inside of your elbow is used. The technician, called a phlebotomist, inserted a needle into your vein to collect the blood. Normal creatinine levels range from 0.7 to 1.3 mg/dL in men and 0.6 to 1.1 mg/dL in women. (George Krucik, MD, Erica Roth, 2012)

### **Measure the Ratio of Testosterone in the Blood**

A blood sample is taken from a vein. The best time for the blood sample to be taken is between 7 a.m. and 10 a.m. A second sample is often needed to confirm a result that is lower than expected.

#### Reference Values

**Male:** 300 -1,000 ng/dL

**Female:** 15 - 70 ng/dL (Brent Wisse, MD,Zieve, MD, MHA, Isla Ogilvie, A.D.A.M, 2014)

### **Blood Glucose Measurement**

We have chosen Optium Xceed Diabetes Monitoring System apparatus that are designed to show results in two different units of measure. This is dependent on country standards. In Australia, the correct unit of measurement is 'mmol/L'. In other countries, the standard may be 'mg/dL'. (Medical device incident investigations, 2005)

### **From that, this Study was Limited to Follow-Up**

- Followed the practitioners(Doping injections VS Anabolic Steroids)for two months of experience

- Measurement variables Medical tests at the end of this experiment
- Control the variables (time sleep - time program - Living situation training and retrieval means)

**All Medical Tests Applied taken**

- The sample was fasting
- 78 hours after the last used (injection & anabolic)

Where our objective interested in this experiment was concentrated on the Measurement variables Medical tests As to study the correlation ship that explain them Risks. As homogeneity of our sample we based on the following variables; amateur athletes ( $\geq 18$  years; 5 years of bodybuilder practice) and their practice as difference (anabolic & injection) for two months.

**DATA COLLECTION**

**Subjects**

Our experience is composed of (10) voluntarily amateur athletes who practices bodybuilder five from them practice injections anabolic steroids While 5 Another incorporate in their Nutrition Anabolic Steroids where it was agreed that the Search teams is not responsible for complications.

From this band the research teams role is limited to monitoring the expierence and take measures planned with the agreement of the participants

**Data Analysis**

Based on the Medical tests with their natural ratios and rates our Lab team confirm that all sample results are Greater than the normal limit see the normal limit and figure 2.

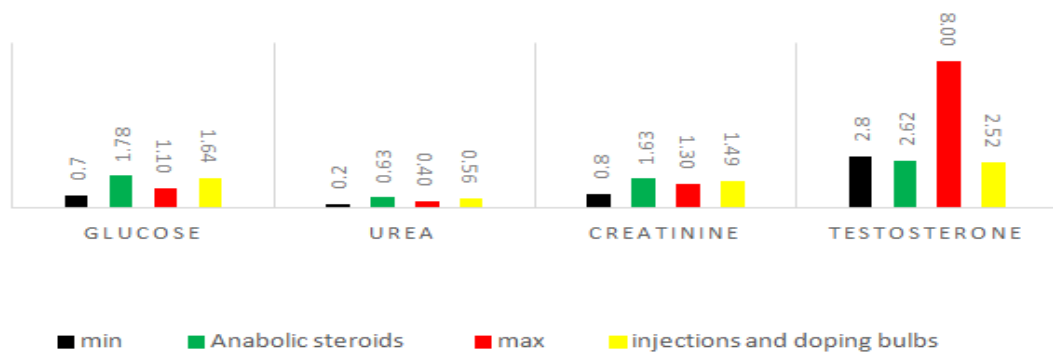
The normal limit :

**Glucose:** 0.70-1.10mg/L

**Urea:** 0.20-0.40mg/L

**Creatinine:** 0.8 to 1.3 mg mg/L

**Testosterone:** 2.80-8ng/mL



**Figure 2: Shows the Results of Medical Test after Two Month in the Limit of our Experience**

**RESULTS AND DISCUSSIONS**

**Table 1: Description of the Acquired Results of Our Samples in the Medical tests**

Variables		t	Mean±SD	R		df	Sig. (2-tailed)
Glucose	Oral steroids	0.83	1.78±.23	1		8.00	0.43
	injections and bulbs		1.64±.28				
Urea	Oral steroids	2.72	.63±.045	1	.834**		0.03
	injections and bulbs		.56±.043				
Creatinine	Oral steroids	2.82	1.63±.08	1			0.02
	injections and bulbs		1.49±.08				
Testosterone	Oral steroids	1.85	2.60±.07	1			0.10
	injections and bulbs		2.52±.06				

From the figure 2 through the results table1, major of comparisons are in the benefit of oral steroids group (Mean-SD), another all sample results are Greater than the normal limit within all comparisons. Where (C Saudan, N Baume, N Robinson, L Avois, P Mangin, M Saugy, 2006) confirm our findings in the case oral Anabolic steroids that, the Anabolic steroids are synthetic derivatives of testosterone, modified to enhance its anabolic actions (promotion of protein synthesis and muscle growth). However In the case injectable anabolic steroids (Michael Mooney, Nelson Vergel, 1999) that, injectable anabolic steroids are somewhat preferable to any oral steroid because of their lack of liver toxicity Effect. After several injections, long-acting injectable oil-based steroids like testosterone. From those raison the impact of this research rolling around the drugs and dietary supplements that have become promoted in sports halls. Where (Lauralee Sherwood, 2011) confirm that, the most of Studies have confirmed the increase muscle mass when they used in large amounts and coupled with heavy exercise where (Aharon W. Zorea Ph.D, 2014) set that, anabolic steroids evolved throughout the 1980s as public attention, which makes us think The rapid spread.

Based on data Analysis table1 where t calculated is not significant in all the comparison except in comparison urea and creatinine for the benefit of group oral steroid where our find and subjection line with the report of (Jeri Freedman, 2009) as word of the energizing and strength-enhancing effects of steroids spread, they became the drugs of choice. Extensive use of steroids began in weight lifting for the caused we refer to (George A Bray, Claude Bouchard, 2014) that, they have broad physiological effects, accounting for their significant adverse effect profile. For those resent, we support the view of (Luis Severiche, 2013) that, Steroid is an important issue to be addressed within the physical bodybuilding, fitness, and people who practice weightlifting (weight lifting) are the STEROIDS, due to the sometimes exaggerated by the media.

Form the medical standards figure 2, our sportive must avoid this ideal, because their health will be Susceptible to diseases, mostly lead the user to death as the example of our champion Benaziza, in case of the body building and the result of the Similar studies that, the Nutritional supplements can be a source of positive doping cases. As some supplements contain prohibited substances without showing this on their label (Olivier de Hon, Bart Coumans, 2007) from that, we recommend our leaders in sports to create Anti-doping policy in the Algerian Leisure sports. Our aims focuses on preventing, and formed Anti-doping policy for the education of our athlete (Ivan Waddington, Andy Smit, 2009) (Hamadou Ali Djemel AbdNacer – Zerf Mohammed – Mokkedes moulay idriss – Atouti Nouredine -Bengoua Ali – Mebrouki Fatiha, 2015)

Where our finding in the table1 that, Correlation is statistically significant in favor of the same comparison While

Correlation urea & creatinine is significant at the 0.01 level (2-tailed) which is identical to the confirming of (Lauralee Sherwood 2011): these agents adversely affect the reproductive and cardiovascular systems and the liver Kidney. Where we agree with (John Josias Conybeare (Sir.), William Neville Mann, 1975) that the simplest test of renal function is the measurement of the blood urea level. The normal range is from 20 to 40 mg. per 100 ml. The actual level depends upon the equilibrium between urea productions from protein. Where for the creatinine, we agree with (CATHEY PINCKEY AND EDWARD R. PINCKNEY, M.D., 1982): that the Normal values: Blood serum creatinine values range for 0.8 to 1.3 mg per 100-ml.

In the case of the measured of testosterone, we agreed with (David Wild, 2013) for that the Normal values Testosterone are 0.22–2.9nmol/L 9.9–27.8nmol/L for Women 0.06–0.82 ng/mL and Men 2.8–8.0 ng/mL (Bayer ACS: Centaur) as for the measured of Glucose. Where we agreed with (G. P. TALWAR, L. M. SRIVASTAVA, 2006) that, blood sugar concentration are from 70 mg/100 ml to 120 mg of glucose in blood.

From those norms, we conform the risky health of the anabolic steroid in general, where we agreed with (Pierre-Edouard Sottas, Gordon F. Kapke, Jean-Marc Leroux, 2013) that, creatinine and urea are able to detect early kidney dysfunction, and we line with (Michael L. Bishop, Edward P. Fody, Larry E. Schoeff, 2013) that, the evaluation of renal function rely on the measurement of waste products in blood, usually urea and creatinine, which accumulate when the kidneys begin to fail. while that, the abuse of testosterone resulted in cases of impotence, prostate cancer, and the development of male characteristics (SARL Politique hebdomadaire, 1984).

Based on results, our docket that, the Health risks associated with the abuse of anabolic steroids are covered along with the biological reasons why steroids affect the body (Géraline C. Lin, Lynda Erinoff, 1996). Where the use of anabolic steroids has been implicated in early heart disease, including sudden death, changes in blood cholesterol profile (increased LDL, lower HDL) resulting in increased risk of coronary artery disease, an increase in tendon injuries (United States. Congress. Senate. Caucus on International Narcotics Control, 2005). Where displace glucocorticoids from glucocorticoid receptors and inhibit muscle protein catabolism, leading overall to an anabolic or muscle building effect (Kuhn CM, 2002) despite scientific data on the cardiac and metabolic complications of doping in general review confirm the effects of the abuse (Achar S, Rostamian A, Narayan SM., 2010).

## **DISCUSSIONS AND CONCLUSIONS OF OUR EXPERIENCE**

Through statistic data analysis and the confirmation of (Simon Outram, Bob Stewart, 2015) that, the potential for supplement use to result in doping infringements is likely to be of concern for anyone involved in sports nutrition. The available data indicates that between 40-70% of athletes use supplements, and that between 10-15% of supplements may contain prohibited substances. Our experience confirm that injection and Oral Anabolic Steroids, Risks is in destabilizes the regulation of vital functions on general and begin kidneys fail in our case results. From that, we consider the practice of doping in the case of our samples, as medical errors pharmaceuticals products made at the public door. For this reason, we recommend our athletes to avoid these practices because the health requires a good reflection of the actors and decision makers (Yves Géry. 2012). Where our find Background theoretical based on the site by (Steven B. Karch, MD, FFFLM, 2006) that the hypothesis of doping is easily advanced to the athletes who use it for quick visual successful results. Where our data medical standards Downiness our amateur athlete that, they must avoid this ideal because their health will be Susceptible to diseases, mostly lead the user to death as the example of our champion

Benaziza, in case of the bodybuilding. Where all studies classification of chronic kidney disease GFR Stage Description (mL/min/1.73m<sup>2</sup>) (Joseph L. Izzo, Domenic A. Sica, Henry Richard Black, 2008), something we don't wish for our athletes.

From that, we recommend our leaders in sports to create programs of prevention in the Algerian Leisure sports (Hamadou Ali Djemel Abd Nacer, 2015). Our aims focuses on preventing, Derived from the experience of the USA Institute of Medicine Model of Prevention and formed Anti-doping policy for the education of our athlete (Ivan Waddington, Andy Smit, 2009)

## OUR RESULTS AND RECOMMENDATIONS

- Doping in general destabilizes the regulation of vital functions.
- The risk determined in this study comes from the relationship urine creatinine followed by the decrease in testosterone and increase of glucose.
- Our samples risked kidney disease.
- Formed Anti-doping policy for the education of our athlete as Program of prevention in the Algerian Leisure and athletics sports.

## OUR AIM

### For our Sample and Responsible in Sports and Health in our Country

- Health foremost
- Integrated the Anti-doping policy for the education of our athlete
- Study the problem posed in other similar studies

Take advantage of this study in the assessment Program of the Algerians prevention

## REFERENCES

1. Achar S, Rostamian A, Narayan SM. (2010). Cardiac and metabolic effects of anabolic-androgenic steroid abuse on lipids, blood pressure, left ventricular dimensions, and rhythm. *Am J Cardiol*, 893-901. doi:10.1016/j.amjcard.2010.05.013
2. Aharon W. Zorea Ph.D. (2014). *Steroids*. USA-UK: ABC-CLIO.
3. ALGÉRIE PRESSE SERVICE. (2015, 3 19). Dopage : le laboratoire effectuera ses premiers contrôles dans "les mois à venir. (ALGÉRIE PRESSE SERVICE) Retrieved 8 15, 2015, from SPORT: [aps.dz/sport](http://aps.dz/sport)
4. Brent Wisse, MD, Zieve, MD, MHA, Isla Ogilvie, A.D.A.M. (2014). *Testosterone*. USA: U.S. National Library of Medicine.
5. CA Burtis, ER Ashwood, DE Bruns. (2006). *Tietz Textbook of Clinical Chemistry*. Philadelphia: WB Saunders Company.
6. CATHEY PINCKEY AND EDWARD R. PINCKNEY, M.D. (1982). *MEDICAL TESTS*.

7. Chafik Boukabes on behalf of Ahmed Bendifallah. *Pharmaco-toxicologue*. (2012, 06 29 ). We must criminalize doping in Algeria. *algeria: El Watan*.
8. DAVID A BARON, DAVID M MARTIN, and SAMIR ABOL MAGD. (2007). Doping in sports and its spread to at-risk populations: an international review. *World Psychiatry*, 6(2), 118–123. doi:PMC2219897
9. David Robson. (2014, 08 26). This article will explain exactly how to conduct one-repetition-maximum testing and suggest ways in which test results can be applied across a range of training objectives. Retrieved from *Bodybuilding.com*: <http://www.bodybuilding.com/fun/drobson39.htm>
10. David Wild. (2013). *The Immunoassay Handbook Theory and applications of ligand binding, ELISA and related techniques*. (4. Edition, Ed.) Access Online via Elsevier.
11. European Union. (2014). *Study on Doping Prevention*. Luxembourg: Publications Office of the European Union.
12. G. P. TALWAR, L. M. SRIVASTAVA. (2006). *TEXTBOOK OF BIOCHEMISTRY AND HUMAN BIOLOGY*. new Dalhi: PHI Learning Pvt. Ltd.
13. George A Bray, Claude Bouchard. (2014). *Handbook of Obesity – Volume 2: Clinical Applications*, Fourth Edition, Volume 2. USA: CRC Press.
14. George Krucik, MD, Erica Roth. (2012). *Creatinine Blood Test*. Healthline Networks, [www.healthline.com/health/creatinine-blood#Overview1](http://www.healthline.com/health/creatinine-blood#Overview1).
15. Geraline C. Lin, Lynda Erinoff. (1996). *Anabolic Steroid Abuse*. USA: DIANE Publishing.
16. Hamadou Ali Djemel Abd Nacer, Z. M. (2015). Advantages and Disadvantages of the Use of Doping in the Sport of Bodybuilding. *American Journal of Sports Science*, 3(5), 89-92. doi:10.11648/j.ajss.20150305.12
17. Hamadou Ali Djemel AbdNacer – Zerf Mohammed – Mokkedes moulay idriss – Atouti Nouredine -Bengoua Ali – Mebrouki Fatiha. (2015). IDENTIFICATION OF THE RISKS OF ANABOLIC STEROIDS IN THE ALGERIAN SPORT BODYBUILDING. 2(9).
18. Ivan Waddington, Andy Smit. (2009). *An Introduction to Drugs in Sport: Addicted to Winning?* USA: Routledge.
19. Jeffrey K. Aronson. (2009). *Meyler's Side Effects of Endocrine and Metabolic Drugs*. UK: Access Online via Elsevier.
20. Jeri Freedman. (2009). *Steroids: High-risk Performance Drugs*. The Rosen Publishing Group.
21. John Josias Conybeare (Sir.), William Neville Mann. (1975). *Conybeare's Textbook of Medicine*. C. Livingstone: Amazon France.
22. Joseph L. Izzo, Domenic A. Sica, Henry Richard Black. (2008). *Hypertension Primer*. USA: Wolters Kluwer Health.
23. Kuhn CM. (2002). Anabolic steroids. *Recent Prog Horm Res.*, 57.
24. Lauralee Sherwood. (2011). *Fundamentals of Human Physiology*. USA: CengageBrain.com.
25. Luis Severiche. (2013). *Bodybuilding: Nutrition, Training and Steroids*. USA: Amazon France.



26. Medical device incident investigations. (2005). Medical device incident investigations. australia: Medical device incident reporting & investigation scheme (IRIS) articles.
27. Michael L. Bishop, Edward P. Fody, Larry E. Schoeff. (2013). Clinical Chemistry: Principles, Techniques, and Correlations. Wolters Kluwer Health.
28. Michael Mooney, Nelson Vergel. (1999). Built to Survive: A Comprehensive Guide to the Medical Use of Anabolic. USA: Nelson Vergel.
29. Pierre-Edouard Sottas , Gordon F. Kapke, Jean-Marc Leroux. (2013). Adaptive Bayesian Approach to Clinical Trial Renal Impairment Biomarker Signal from Urea and Creatinine. Int J Biol Sci, 9(2), 156-163. doi:10.7150/ijbs.5225
30. SARL Politique hebdomadaire. (1984). Le Point - Numéros 614 à 627. Le Point.
31. Simon Outram, Bob Stewart. ( 2015). Doping Through Supplement Use: A Review of the Available Empirical Data. INTERNATIONAL JOURNAL OF SPORT NUTRITION AND EXERCISE METABOLISM 25 (1, 54-9) .
32. Steven B. Karch, MD, FFFLM. (2006). Drug Abuse Handbook. USA: CRC Press.
33. United States. Congress. Senate. Caucus on International Narcotics Control. (2005). Abuse of Anabolic Steroids and Their Precursors by Adolescent Amateur Athletes: Hearing Before the Senate Caucus on International Narcotics Control, One Hundred Eighth Congress, Second Session, July 13, 2004. United States: United States. Congress. Senate. Caucus on International Narcotics Control.
34. Wikipedia. (2015, 08 01). Mohamed Benaziza. Retrieved from Portail de la musculation: fr.wikipedia.org/wiki/Mohamed\_Benaziza
35. William N. Taylor, M.D. (2002). Anabolic Steroids and the Athlete, 2d ed. usa and UK: McFarland.

