Ann. For. Res. 65(1): 9817-9823, 2022
ISSN: 18448135, 20652445

ANNALS OF FOREST RESEARCH
https://www.e-afr.org/

PHYSIOLOGICAL EFFECTS OF TOBACCO AT TUNISIAN AND FRENCH BASKETBALL PLAYERS/INTOXICATION OF BODY AND BRAIN OF LEARNERS AND PLAYERS AND POLLUTION OF CULTURAL AND NATURAL ENVIRONMENTS

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Abstract

Objective: To identify the physiological impact of the tobacco addiction particularly on the respiratory function at Tunisian basketball players in comparison with French ones.

Method: In the goal to achieve our objective a study has been led on a sample representative n=18 of basketball players aged from 19 to 26 years of which 9 smokers and 9 not smokers. Nicotine dependence was valued with the help of the questionnaire of Fagerström. The assessment of effects of the tobacco addiction on the respiratory function of individuals tested was made by spirometry. The comparison between the respiratory volumes at group smokers and group not smokers were established by two statistical tests: the linear regression and the T test of Student.

Results: Answers to the test of Fagerström showed that the group of basketball smoker players was a little dependent to the nicotine with an average of points of 2. 66 ± 1. 11. Line of linear regression drawn from the theoretical and measured values of the VEMS at smokers and not smokers represents the condition where one has theoretical VEMS = measured VEMS. We got with these coefficients of R^2 interrelationship of 0. 40 and 0. 03 at basketball players not smokers and smokers respectively. What sustains the hypothesis that not smokers tend to have a better seen respiratory function that the measured values are nearer of the applied values (R^2=0.4). We also noted a meaningful difference ($p < 0.05$) between indications of Tiffeneau (VEMS/CVF) at smokers and not smokers. Besides, this indication is lowered at smokers with an average of 84,9 ± 0,7 against 85,7 ± 0,5 at not smokers. The study done on sportsmen and not sportive smokers and French not smokers, showed that the VEMSS are lowered at smokers in relation to the VEMSS at not smokers with an average of 3. 7 ± 0.6 at smokers and 4. 0 ± 0.7 at not smokers.

Conclusion: In our study, we compared results of the Tunisian basketball players to those of the French study presented reveal above that our hypothesis given out on the deleterious effects of the tobacco addiction on the respiratory function of sportsmen confirms itself. These results also show that while exercising a sportive activity, we can have a better respiratory function even while being a smoker. It confirms the fact that the sports present means of prevention AGAINST TOBACCO.

Keywords: *Smokers, non-smokers, Basketball players and tobacco addiction.*

1. MATERIAL AND METHODS

Subjects: The study was about a sample of 18 students basketball players of the ISSEP of Sfax. It was about 9 smokers and 9 not smokers aged of 19 at 26 years, choose according to an uncertain process. Their number of years of practice of the Basketball varied of one and four years. These topics do daily close to two at three hours of physical practice. Topics smokers consumed at least per day a cigarette since three years. The sample of students on which the survey was done, were divided in two groups, of smokers (A group) and of not smokers (B group).

Test of Fagerström: Tobacco misleads a dependence that can be 2 types: Psychic dependence, whose backing will be positive: relaxation, psycho - stimulation, decrease of the anxiety or physical dependence, whose backing will be negative: state of lack. It is the nicotine that is responsible for this dependence. The TEST says FAGERSTROM permits to measure the pharmacological dependence to tobacco. This test amounts to questions put to topics smokers.

Spirometry: The spirometry consists in a set of respiratory function exams, in order to determine the different pulmonary capacities, the pulmonary volumes and debits of air (inspiration, expiration) of the patient. Results are presented under shape of graphic representative the volume according to the time and debit according to the volume. He/it exists two main types of spirometry: simple and forced. The realization of this test settled with the help of the " Spirobank portable G-USB ", of MIR (Medical International Research), one of the world leaders on the market of devices of diagnosis spirometry. The basketball player, smoker or not smoker, relaxed, is installed comfortably close to the device, gets at ease to breathe comfortably and place a translator in the mouth. The topic has some cycles of normal breathing before beginning the real exam. The player must inspire then deeply and slowly and to link by a forced and fast expiration, in order to expel the air most possible of lungs. The exam consists in three forced expirations of this type. He/it is preferable that the player doesn't eat too heavy and doesn't smoke the 5h preceding the exam.

Measured parameters: With the forced spirometry, we measure the debit of air according to the pulmonary volume, we get thus as main measured parameters: Capacity vital forced CVF: The CVF is measured at the time of a forced expiration. The player is either sat standing. He/it inspires in depth and breathe the most quickly possible all the air of his/her/its lungs in the spirometry. Volume expiratory forced VEMS: Volume Expiratory Maximal Assists = quantity of outcast air during the first second of the forced expiration, achieved after a maximal inspiration. VEMS/CVF or indication of Tiffeneau: it is about the report, in percentage, of the capacity forced during the first second, to the slow vital capacity (total). His/her/its normal value is superior to 80%. A normal topic exhales 80% of his/her/its vital capacity in the first second of a forced expiration. At an obstructive patient, the VEMS is decreased evoking an obstructive respiratory insufficiency. When the VEMS and the CVF decreased and the Tiffeneau indication remained steady or same increased, it could be suggestive for a restraining respiratory insufficiency. Post - treatment of data of the spirometry: Several statistical tests have been done with the help of Microsoft Excel from data of

the spirometry, in order to compare the respiratory function at basketball smoker players and not smokers.

Linear regression line: The linear regression line is a statistical tool particularly used to compare the theoretical values waited to the applied values. This linear regression line is constructed so that it represents to best moments where we have equality of the theoretical value and the tentative value. The calculation of the linear regression line is complex enough. It is calculated on a period determined with the least square method. The line has for formula: Of it = AX+ B, Yi corresponds to the measured respiratory parameter and Xi corresponds to the theoretical respiratory parameter of the n topic. From it, we can find the coefficient of interrelationship (R2) that can inform us on the nature of the relation between the measured and theoretical values. More the measured values will be near of the linear regression line more the tendency will be strong, and more the linear regression line will be applicable. The R2 will be raised. To the inverse more the measured values are distant of the regression right, more the tendency will be weak and more the R2 will be weak. This indicator judges the relevance of the linear regression line in a way. Elevated R2 = > strong tendency/ Weak R2 = > weak tendency.

Test T of student: This test is destined to test the significance of a difference noted between two averages, what supposes the two distributions is normal following a law of distribution gaussien. She/it applies in a different way according to the type of samples: case of our study.

2. RESULTS:

Results of the Questionnaire of Fagerström: From answers of basketball smoker players to the questionnaire a sum of points was calculated and was reported on an Excel file. Nicotine dependence of this group was varied (22% dependent) with an average of points equals to 2. 66 and a gap type of 1.11, what translates a weak dependence of this basketball smoker players group on average.

Results of the spirometry: A comparative analysis of parameters measured at basketball smoker players and not smokers were established during this study. Measures by spirometry are the object of the table 1.

		Average	Gap-type	Moy ± E.T
Age (years)	S	23,111	1,269	23,1 ± 1,3
	NS	21,000	2,550	21 ± 2,5
Weight (kg)	S	72,889	9,400	72,9 ± 9,4
	NS	68,000	7,566	68 ± 7,6
Number cigarettes /year	S	178,667	86,255	178,7 ± 86,3
	NS	0,000	0,000	0 ± 0
CVF m (L)	S	4,241	0,722	4,2 ± 0,7
	NS	3,869	0,787	3,9 ± 0,8
CVF th (L)	S	5,402	0,354	5,4 ± 0,4
	NS	4,860	0,346	4,9 ± 0,3
VEMS m (L)	S	4,070	0,510	4,1 ± 0,5

	NS	3,747	0,697	3,7 ± 0,7
VEMS th (L)	S	4,634	0,268	4,6 ± 0,3
	NS	4,190	0,323	4,2 ± 0,3
VEMS/CVF m (%)	S	96,567	5,710	96,6 ± 5,7
	NS	97,236	3,326	97,2 ± 3,3
VEMS/CVF th (%)	S	84,922	0,712	84,9 ± 0,7
	NS	85,722	0,479	85,7 ± 0,5
VVM m (L/min)	S	145,111	38,393	145,1 ± 38,4
	NS	108,467	21,241	108,5 ± 21,2
VVM th (L/min)	S	136,667	11,402	136,7 ± 11,4
	NS	128,733	10,181	128,7 ± 10,2

Table 1: Results of test of spirometry

S: smoker; NS: no smoker; CVF: Forced Vital Capacity; VEMS: the Volume Expiratory Maximal per Second; **VEMS/CVF** or indice of Tiffeneau; m for measured and th for theoretical; VVM: Maximal Voluntary Ventilation per minute.

Results of linear regression: This analysis was made on an important parameter that reflects the respiratory function that is the Maximal Volume Expiratory well assists VEMS. Faces represent the comparison of the theoretical results and the experimental results of the VEMS below at smokers and not smokers. Lines of linear regression drawn from the theoretical and measured values of the VEMS at smokers and not smokers represent the condition where we have theoretical VEMS = measured VEMS. We got with these lines of coefficients of R^2 interrelationship of 0.40 and 0.03 at basketball players not smokers and smokers respectively. What sustains the hypothesis that not smokers tend to have a better seen respiratory function that the measured values are nearer of the applied values (R^2=0.4).

Results of Test of student: From data gotten in spirometry, a comparison of the two groups of basketball smoker players and not smokers have been established by the statistical test of Student. One could note that while comparing the vital capacities forced of basketball smoker players and not smokers, we have a meaningful difference of the theoretical CVFS with a value of corresponding t to a p doorstep < 0,05 (Table 2).

	Smokers (S)	Not Smokers (NS)	T Student	p	Significance
Weight (kg)	72,9 ± 9,4	68 ± 7,6	1,215442	0,2418	NS
Nbre cig /an	178,7 ± 86,3	0 ± 0	6,214101	0,0000	V.S à P<0.001
CVF m (L)	4,2 ± 0,7	3,9 ± 0,8	1,045328	0,3114	NS
CVF th (L)	5,4 ± 0,4	4,9 ± 0,3	3,282718	0,0047	V.S à P<0.01
VEMS m (L)	4,1 ± 0,5	3,7 ± 0,7	1,122889	0,2781	NS
VEMS th (L)	4,6 ± 0,3	4,2 ± 0,3	3,179539	0,0058	V.S à P<0.01
VEMS/CVF m (%)	96,6 ± 5,7	97,2 ± 3,3	0,303659	0,7653	NS
VEMS/CVF th (%)	84,9 ± 0,7	85,7 ± 0,5	2,796776	0,0129	S à P<0.05

VVM m (L/min)	145,1 ± 38,4	108,5 ± 21,2	2,505466	0,0234	S à P<0.05
VVM th (L/min)	136,7 ± 11,4	128,7 ± 10,2	1,557011	0,1390	NS

Table 2: Results of Test of student

(NS: Not Significant; S: Significant; VS: Very Significant).

We could note that while comparing the vital capacities forced of basketball smoker players and not smokers, we have a meaningful difference of the theoretical CVFS with a value of corresponding t to a p doorstep < 0,05 (Table 2). This indication can inform us on possible obstructive or restraining illnesses can be associated to tobacco.

3. COMPARISON TO A FRENCH STUDY:

We tried to compare our experimental results to results of a study made on a population of sportsmen and not sportive smokers and not smokers. The study done on sportsmen and not sportive smokers and not smokers, had settled on a population of 28 people of which 14 smokers (A group) and 14 not smokers (B group). Among individuals of the group A and B, we counted 5 non sportive of which 3 smokers and 2 not smokers, and the remainder of the studied population is some sportive level sportsmen grows. The linear regression test was done as we had made on our results, in order to compare the VEMSS at sportsmen and not sportive smokers and not smokers. Lines of linear regression drawn from the theoretical and measured values of the VEMS at smokers and not smokers represent the condition where we have theoretical VEMS = measured VEMS. And we see good that not smokers tend more to have the equal theoretical VEMSS to the measured VEMSS. These results gotten on the French sportsmen come to sustain the hypothesis that not smokers have a better respiratory function that the smokers view that the measured values are nearer of the applied values. Besides, the sportive individuals and not smokers are especially those that have the best pulmonary working.

French				
		Average	Gap- type	Moy ± E.T
VEMS m (L)	Sportive smokers	4,40	0,60	4,4 ± 0,6
	Not sportive smokers	4,20	0,70	4,2 ± 0,7
	Sportive not smokers	3,70	0,60	3,7 ± 0,6
	Not smokers Not sportive	4,00	0,70	4,0 ± 0,7

Table 3: Results of spirometry of the French study

Results of our study on the Tunisian basketball players compared to those of the French study presented reveal above that our hypothesis given out on the deleterious effects of the tobacco addiction on the respiratory function of sportsmen confirms itself. These results also show that while exercising a sportive activity, we can have a better respiratory function even while being a smoker. It confirms the fact that the SPORT presents means of prevention AGAINST TOBACCO.

4. DISCUSSION

Add us in this study left of the hypothesis according to which the tobacco addiction has a harmful effect on the respiratory function at basketball smoker players. Of this fact, smokers will have parameters of pulmonary function more damaged that at not smokers. In order to validate this hypothesis, we did a set of experiences on basketball smoker players and others not smokers. The comparative study of parameters measured with the help of the spirometry, showed us of the mitigated differences, of the statistically meaningful differences between parameters of pulmonary function theoretical, but not always statistically meaningful for parameters measured at the two groups. Non significance of the differences view sometimes between the two groups can be explained on the one hand by the fact that the tested individuals smokers were not on average smokers dependent to tobacco, they were practically all few dependent, and on the other hand that these individuals smokers were protected well by their regular sportive activity, what confirms the principle of prevention against tobacco by the sport. Finally, our results as well as those of the study made in parallel at the French sportive individuals come to confirm our hypothesis on the effect harmful of tobacco on the respiratory function at sportsmen.

5. CONCLUSION

This work by his/her/its instructive title, permitted me a discovery of the research world, in particular of techniques and tests dedicated for the assessment of the physiological effects of tobacco. The goal of this work was to lead an assessment of the physiological effects of tobacco on the Tunisian and French basketball players, and more precisely a study of tobacco effects on the respiratory function at these basketball players. Our experimental results, on the Tunisian sportsmen and confirmed the hypothesis given out in beginning of this study according to which basketball players not smokers were supposed to have a best respiratory function well in parallel on the French sportsmen that we observed at basketball smoker players. Following knowledge acquired with this study. I found this very interesting experience to develop, by a framed practice, a sense of the responsibility while having the opportunity for an application and a training of my theoretical knowledge. Seen the stake of the topic, experiences done during this research deserve to continue beyond this work, for a possible assessment of other physiological parameters can be influenced by the tobacco addiction.

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