Sys Rev Pharm 2020;11(11):1818-1820
A multifaceted review journal in the field of pharmacy

Cadmium and Selenium Levels in Blood Smokers of Water Pipe (Hookah) in Baghdad

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ABSTRACT

The study aims to assess the level of trace elements such as cadmium and selenium, which become toxic whenever they rise above the normal level in the human body. Blood samples were taken for a group of young smoker's shisha, whose ages range between 20-45 years, and the amount of cadmium and selenium in these samples was examined by the flame atomic spectroscopy device where There was a large percentage of these elements in the blood of person who smoke when compared to blood samples of person who do not use cigarettes and shisha, and this indicates that smoking shisha leads to an increase in the level of selenium and cadmium in the blood.

Keywords: Cadmium and selenium, shisha, atomic flame absorption spectrophotometer.

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INTRODUCTION

With the development of life and the continuation of smoking with cigarettes or smoking the shisha, cases of cadmium poisoning and symptoms of its presence in the blood of smokers appear, and many studies and research have indicated the existence of unauthorized proportions of toxic elements such as cadmium and selenium, Selenium toxicity was discovered in 1850 AD and determined the toxicity of selenium through its chemical nature; As it turns from the form of selenite to selenite, then to organic selenium, and thus be one of the most dangerous trace elements [1].

There are some effects of chronic selenium poisoning, including: Back warp, arthritis, skin roughness, and inhalation in the long run will irritate the respiratory system and cough, and exposure to high concentrations of selenium through the mouth in the long-term causes selenium poisoning [2]. Cadmium high level caused many diseases such as heart diseases, high blood pressure [3]. Also, and to obtain information about exposure of people to the unhealthy environment, those element scale in the body is measured in micrograms of Cadmium and selenium per deciliter of blood (micrograms / deciliter). Cadmium levels are 0.2 – 0.6 mg/dl the minimum allowed, and the average concentration of selenium in the blood 50-100 mg/dl [4]. Tobacco products and their smoke contain (4000) toxic substances, the most important of which are heavy metals, solvents, cyclic and non-cyclic hydrocarbons, aromatic amines, pesticides, gases, etc. Tobacco is the main source of cadmium [5].

MATERIAL AND METHOD

50 of blood samples were taken specifically smoker's shisha and 30 of blood samples from non-smokers age from 20-47 years. The samples were randomly selected from several laboratories to do a questionnaire for smokers [6].

Subject to study and the relationship of accumulation of these two elements in the body with the length of smoking, then, the results of the questionnaire were linked to the level of concentration of the two components under study [7]. Samples have been collected, five milliliters of intravenous blood was put into EDTA tube then put into ice box samples were prepared for analysis [8].

The sample was mixed with nitric acid and was left for an hour to ensure that the protein was dissolved. The sample placed in a centrifuge 4500 rpm. The supernatant was taken using fine pipettes and placed in a dry plastic tube for analysis using AAS [9].

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RESULT AND DISCUSSION

The concentration level of cadmium and selenium minerals was measured in samples the blood of smokers and non-smokers. A comparison was made between these levels and the permissible proportions [10]. The results showed that there is a variation in the levels of the presence of these elements in the blood between smokers and non-smokers. And study the link between increasing the proportions of these elements with the duration of smoking, and the use of blood is a biological indicator through which the effect of smoking can be measured on increasing the concentration of elements such as: cadmium and selenium [11]. Then study the dangers and effects on human health. The following tables show the concentrations of the element's cadmium and selenium in the blood samples taken from smokers and compared them with blood samples of non-smokers [12].

Table1: Concentration of cadmium and selenium in the blood of smokers

sample number	Age	Smoking years	Cadmium concentration mg/dl	Selenium concentration mg/dl	sample number	Age	Smoking years	Cadmium concentration mg/dl	Selenium concentration mg/dl
1	22	10	1.21	170.0	27	31	11	1.09	121.9
2	20	15	1.80	197.11	28	40	20	1.02	207.0
3	40	20	1.08	187.5	29	42	17	2.07	188.6
4	44	20	1.91	202.8	30	27	10	1.76	167.2
5	35	9	1.02	100.89	31	24	9	0.24	180.1

6	30	12	1.99	189.5	32	37	3	0. 9	102.8
7	25	15	2.04	167.0	33	39	15	0.89	200.7
8	23	15	5.70	204.8	34	40	8	7.90	198.7
9	45	22	1.08	120.6	35	36	10	0.9	190.2
10	20	3	8.09	189.5	36	46	11	1.33	187.9
11	33	10	5.60	180.7	37	23	3	1.09	170.6
12	40	11	1.92	167.9	38	44	20	1.09	189.3
13	26	3	1.55	122.8	39	35	12	3.95	190.0
14	44	14	1.76	189.3	40	45	14	0.80	210.9
15	41	12	1.87	180.6	41	40	14	0.85	200.7
16	37	15	1.22	177.9	42	40	12	1.00	146.8
17	40	20	2.02	200.7	43	43	17	1.53	177.3
18	21	2	2.06	173.44	44	33	7	1.09	150.0
19	44	14	1.00	122.54	45	30	3	0.98	155.9
20	38	14	1.85	165.5	46	29	9	3.07	167.0
21	38	11	0.8	50.7	47	35	10	1.09	100.1
22	33	9	2.01	175.33	48	47	17	0.71	103.9
23	28	6	1.56	155.7	49	42	15	0.70	193.9
24	39	10	0.80	190.9	50	45	22	1.69	112.0
25	42	13	0.86	197.0	51	38	5	1.89	108.8
26	44	12	0.81	166.2					

Table2: Concentration of cadmium and selenium in non-smoking blood

sample number	age	Cadmium concentration Mg/dl	Selenium concentration Mg/dl	sample number	Age	Cadmium concentration mg/dl	Selenium concentration Mg/dl
1	20	17.02	30.23	16	44	0.70	122.09
2	24	8.99	91.80	17	41	1.22	100
3	44	22.00	100.6	18	37	0.2	68.9
4	32	17.9	109.6	19	39	14	100.65
5	33	31.22	96.98	20	30	11.90	66.98
6	26	0.9	76.80	21	35	23.08	45.02
7	47	8.34	100.43	22	25	0.9	70.0
8	45	0.2	132.9	23	27	7.09	99.06
9	22	0.7	126.84	24	20	10.22	103.88
10	30	9.15	55.89	25	30	12	100.7
11	40	1.03	101.9	26	44	2.09	105.8
12	27	0. 6	122.8	27	20	7.09	121
13	21	10.8	66.94	28	28	11.23	102.87
14	36	0.4	52.90	29	31	0.90	40.99
15	38	13.00	107.6	30	33	0.02	78.98

The concentration level of cadmium and selenium minerals was measured in the blood samples of shisha smokers and non-smokers, and the results were monitored in the tables. The concentration of each element in the blood of smokers and non-smokers was compared and a comparison was made between these levels and the permissible proportions of the levels of the presence of these elements in the blood [13]. The use of blood samples and measuring the proportions of elements in them is an important biological indication of the effect of dangerous cadmium and selenium proportions and affecting human health [14].

We note that the concentration of cadmium ranges between (66-22) mg/L, meaning that the concentrations recorded the highest values at 66 mg/L for smokers, and these values exceed the permissible limit for the element cadmium [15], And the concentration of selenium tables recorded values ranging from 122-207 mg/L for which the highest value is 207 mg/L for which is a high value in relation to the permissible limit for the blood of a shisha smoker it varies according to the age and number of years of smoking [16].

Recent studies have indicated an increase in the levels of cadmium and selenium in the blood of cigarette smokers and their effect on human health [17]. Some research has indicated the presence of lead and cadmium elements in hair and blood samples, as well as semen of people who smoke cigarettes [18].

he entry of these substances into the smoker's body and its flow into it is proven by measuring the concentrations of these components in the smoke that the smoker inhales, as these concentrations are much greater than their concentrations in the air free of tobacco product smoke [19], as it was revealed in a study conducted that measuring some vital samples of tobacco products in the smoker body Its concentrations appear in the blood of the smoker [20], urine and saliva more than in the blood, urine and saliva of those who do not smoke and are not exposed to smoke from tobacco products from the smoker [21].

We conclude from this study that the ratios of the concentration of cadmium and selenium elements are directly proportional to the duration of smoking as shown from the tables that clarify the relationship between the concentration of cadmium and selenium

elements with the length of the smoking period [22], noting that some concentrations of cadmium and selenium elements are high in some samples with short smoking periods compared to the sample concentrations With long smoking periods and the reason for this is the difference in the amount of smoking a smoker.

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