

EFFECTS OF SMOKING ON BLOOD TESTS OF 20 YEAR OLD STUDENTS

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20 YAŞ GRUBU ÖĞRENCİLERDE SİGARANIN KAN DEĞERLERİNE ETKİSİ

ÖZET:

Fakültemizde okuyan 20 yaş grubu öğrencilerde sigara alışkanlığının kan değerlerine etkisi araştırılarak, sigara içen erkeklerde lökosit sayısında belirgin artış, eritrosit sayısında belirgin azalma saptanmıştır.

SUMMARY:

In this research the effects of smoking on the blood tests of our Faculty's students who were 20 years old were determined. There was a significant increase at the leukocyte count and decrease at the erythrocyte count in smoker boys comparing nonsmokers.

INTRODUCTION:

The research is on the effects of smoking on the blood tests of our Faculty's students who have higher standards of living compared to the Turkish population in general. A similar research had been conducted in 1974 by UNICEF, CARE, Hacettepe University and Turkish Health and Education Ministries jointly concerning the changes on hemoglobin level, erythrocyte and leukocyte counts depending on nutrition habits and socioeconomic levels.

Hypoferric anemia can be seen frequently in the societies which have poor

social and economical conditions. It is known that the symptom of the food deficiency and anemia which is related to iron deficiency is also frequent in Turkey, especially amongst children.

We planned to search the blood tests of a group of students studying in our Faculty, to observe if there is an alteration on the blood test values related to nourishment, cultural, environmental and regional characteristics and smoking habits.

MATERIAL and METHODS:

To start with, we determined the effects of smoking on the erythrocyte and

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The Blood Test Of Smoker and Nonsmoker Male and Female

Group	Population	Leukocyte Count		Erythrocyte Count		Hb		Hematocrit		MCV		MCHC		MCH	
		(per mm ³)	(per mm ³)	(mil. mm ³)	(mil. mm ³)	(g%)	(g%)	(vol %)	(vol %)	(mm ³)	(mm ³)	(g%)	(g%)	(pg)	(pg)
Nonsmoker	15	6886.5	±322.67	5.13	±185092.3	12.9	±0.412	47.7	±1.015	92.7	±2.582	25.4	±1.057	27.4	±0.844
Nonsmoker female	26	7119.5	±299.13	4.53	±139811.9	11.6	±0.247	42.6	±0.637	96.2	±3.098	26.4	±1.072	27.4	±0.758
P		n.s.	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Smoker male (minimum 5 cigarettes/day)	19	7265.6	±504.48	4.76	±162416.7	12.9	±0.298	46.8	±1.204	97.9	±4.107	27.8	±1.363	27.8	±0.781
P		n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Smoker male (less than 20 cigarettes/day)	7	5527.2	±605.33	4.89	±109929.74	13.3	±0.670	47.5	±2.284	97.6	±6.809	27.3	±1.403	28.2	±1.32
P		n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Smoker male (more than 20 cigarettes/day)	12	8279.5	±529.88	4.68	±246315.44	12.6	±0.198	46.3	±1.345	98.7	±3.66	28.6	±1.91	27.98	±0.899
P ₁ (with nonsmokers)		<0.05	<0.05	<0.05	<0.05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
P ₂ (with smokers less than 20 cig)		<0.05	<0.05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Smoker female (minimum 5 cigarettes/day)	8	8429.6	±882.97	4.62	±155871.1	12.0	±0.466	42.2	±1.142	92.3	±4.22	26.3	±1.33	28.6	±1.001
P		n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

leukocyte count, hematocrit and hemoglobin values of the fourth semester students. None of them was acutely ill. From this data mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) were calculated(1) and examined statistically by student t test.

Smoking and Blood Tests:

Meanwhile we investigated the period of smoking and number of cigarettes they smoke in a day. The fourth semester students population were 68 and 34 of them were girls. Mean smoking period of the girls was 2.5 years, the ratio of the smokers was 23% and the number of cigarettes they smoke per day was 12. And as for boys the smoking period was 4 years, the ratio of smokers 56 % and the number of cigarettes they smoke per day was 18.

RESULTS and DISCUSSIONS:

The results are given in a table comparing the sex and smoking habits and statistically controlled by student t test and variation analysis.

As it is shown in table the erythrocyte count, Hb and packet cell volume (hematocrit) are different significantly from each other in nonsmoker girls' and boys' groups. These are normal physiological differences (2,3). However in our research there is a significant increase at the leukocyte count in smoker boys comparing nonsmokers similar to Helman and Rubenstein's Friedman and coworkers', Lellouch and Schwartz's and Banks's reports(4,5,6,7). Mechanisms by which smoking can increase the leukocyte count include nicotine-induced release of catecholamines which can raise the leukocyte count and irritant effect of smoke on the respiratory tree with resultant inflammation(5).

Erythrocyte counts of boys are higher in nonsmokers than in smokers (more than 20 cigarettes).

Tobacco amblyopia, a curious visual disorder in vitamin B₁₂ deficient smokers, has been attributed to the tendency of

cyanide in tobacco smoke to convert a meager supply of vitamin B₁₂ coenzyme to metabolically inert cyanocobalamin. The neurologic manifestations of vitamin B₁₂ deficiency are today observed infrequently. The neurologic syndrome may occur and progress in the absence of anemia(8).

One plausible candidate is the hydrogen cyanide in cigarette smoke. The thiocyanate levels in plasma and urine of smokers are higher than those in nonsmokers and are inversely related to serum vitamin B₁₂ concentrations. Mc Garry and coworkers propose that the cyanide of tobacco smoke is detoxified by pathways involving vitamin B₁₂, depleting the vitamin with subsequent alternate detoxification by production of thiocyanate(9).

Alternatively they postulate that hydroxycobalamin is converted to cyanocobalamin which may be physiologically inactive. Conceivably this diversion of vitamin B₁₂ could result in macrocytosis without anemia. However cigarette smokers are not only anemic but generally have elevated Hb concentrations.

Perhaps carbon monoxide causes the erythrocytic changes or there is a combination of effects. For example carbon monoxide induced hypoxia produces a demand for more erythrocytes. The demand can not be met because of cyanide induced diversion of vitamin B₁₂ away from nucleoprotein synthesis. The result would be little change in erythrocyte number but increases in erythrocyte size and Hb content(4,10).

Still we are searching the relation between serum vitamin B₁₂ and thiocyanate concentration of smokers.

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