TOBACCO USE AMONGST HIGH SCHOOL STUDENTS IN THE CZECH REPUBLIC

Golan, L.[1], Lubanda, J.C.[1], Netuka, M.[2], Bosanska, L.[3], Lubanda, H.[4], Linhart A[1], Šimek, S.[1, 5], Charalampidi, Ch.[1], Aschermann, M.[1, 5]

[1] 2nd Department of Internal Medicine, The Charles University Hospital, Prague
[2] Institute of Economic Studies, Faculty of Social Sciences, Charles University, Prague
[3] 1st Faculty of Medicine, Charles University, Prague
[4] 4th Department of Internal Medicine, The Charles University Hospital, Prague
[5] EuroMISE centrum-Kardio, Prague, Czech Republic

SUMMARY

Objective: *We were interested in the prevalence of smoking amongst teen-age students, its possible causes, and their understanding of its associated health risks.*

Methods: *We constructed a questionnaire that was responded to by a total of 419 students from 5 high schools in Prague, Czech Republic. Students were classified as non-smokers, mild (1-10 cigarettes daily), moderate (11-20 cigarettes daily), and severe smokers (>20 cigarettes daily). The survey also contained questions about passive smoking, motivation for smoking, the understanding of its associated health risks, alcohol consumption, and drugs.*

Results: *We found that amongst 16-20 years old high school students there are 37.5% smokers (38.0% men, and 37.0% women). The majority are mild smokers (82.3%), 15.8% moderate smokers and 1.9% heavy smokers. 29.0% of non-smokers reported passive smoking; i.e. that 65.7% of students are exposed to harmful effect of tobacco smoke. The average onset of smoking is at 14 years of age. The youngest smoker started smoking at the age of 5 years. Parents of 52.0% of students smoke (69.4% of smokers and 41.6% of non-smokers). Most of students know about the risk of lung cancer and cardiovascular diseases (86-99%).*

Conclusions*: The prevalence of active and passive smoking among high school students is high. Parents smoking is significantly more frequent in teen-age smokers than in non-smokers. We consider the „teen-age" population together with their parents to be the key target for a successful antismoking campaign.*

Key words: tobacco, teen-age, cardiovascular risk, antismoking campaign

Address for correspondence: L. Golan, 2nd Department of Internal Medicine, The Charles University Hospital, 128 00 Prague 2, Czech Republic. E-mail:golan@atlas.cz

INTRODUCTION

Tobacco use is the leading preventable cause of death in many countries. It is one of the most important cardiovascular risk factors. It is directly related to malignancies in various locations, respiratory and other diseases. Besides this mortality and morbidity consequences it is also responsible for significant medical expenses and lost productivity. In spite of these well-known and generally accepted facts its prevalence is high and the antismoking campaign insufficient.

There are significant international, regional and age differences in its prevalence. Some countries were successful in decreasing smoking prevalence (e.g. in the U.S.A. the prevalence dropped from 38.0% in 1970 to 23.4% in 2000), but further decrease is difficult and among younger age groups the trend may be even increasing (1). In some countries it does not decline or is increasing and there may be significant sex dependence (63% of Chinese male vs. 3% of women) (2).

The smoking prevalence is high also in the Czech Republic (3, 4). Since most smokers start smoking early in adulthood, we were interested in the prevalence of smoking amongst teen-age students, its possible causes, and their motivation for smoking and their understanding of its associated health risks.

METHODS

We constructed a questionnaire that was presented to students aged between 16-20 years from 5 randomly selected high schools (3 in Prague and 2 in near surrounding). All schools provided urban population. The questionnaire was voluntary, anonymous, and was filled in during regular class attendance. We asked for date of birth, basic anthropometric data (height and weight), smoking status, its beginning, and intensity. Students were classified as non-smokers, or smokers, if they smoked 1 or more cigarettes daily, and according to the cigarette consumption as: mild (1-10 cigarettes daily), moderate (11-20 cigarettes daily), and severe smokers (>20 cigarettes daily). The questionnaire also contained questions about passive smoking. As a passive smoking we considered a stay in smoke environment three times per week or more for at least

1 hour or if one of family members smoked at home (parents or siblings). We also asked about motivation for smoking (smoking of classmates, parents) or for smoking cessation (whether students expect to stop smoking and why) and the understanding of its associated health risks. Questionnaire included questions concerning cardiovascular diseases, lung cancer and cancer in other locations (e.g. urinary bladder cancer). We also asked about alcohol consumption, marihuana and hard drugs, etc.

After the accomplishment of the questionnaire, 2 cardiologists and one medical student presented a lecture about health risks of smoking. Discussion followed the presentation.

Four hundred twenty three students responded the questionnaire from February through April 2002. Four questionnaires were excluded from analysis because of insufficient data. We calculated body mass index (BMI), mean values and proportions for various variables.

RESULTS

Basic characteristics of the examined population and results are shown in Table 1. We found that amongst 16-20 year old high school students there are 37.5% of smokers. There is no statistically significant difference between males and females (38.5%, resp. 37.0%, Table 2) in smoking prevalence. The majority are mild smokers (82.2%), 15.9% moderate smokers and 1.9% heavy smokers. 57.3% of non-smokers reported passive smoking; i.e. that 73.7% of students are exposed to harmful effect of tobacco smoke. The average onset of smoking is at 14 years of age. The youngest smoker started smoking at the age of 5 years. Parents of 52% of students smoke (41.6% of student non-smokers, 69.0% of mild, 72% of moderate, and all parents of heavy smokers, $p<0.01$, Fig. 1). There was no statistical difference between smokers and non-smokers in proportion of overweight individuals (BMI >25) and there was also no difference in mean values of BMI. These conclusions are valid generally and also separately for male and female (Tables 3, 4).

Most of students know about the risk of lung cancer and cardiovascular diseases (86-99%, Table 5). Only a minority knows of the risk of cancer in other body locations (23%) and consider "light" cigarettes less harmful (19%). Most of the students reported alcohol use (85.7%), some of them also marihuana use (21%) and hard drug use (5.3%, Table 6). The majority believes that they will stop smoking after finishing school in the near future. Women stated "future pregnancy" as the major reason for the cessation of smoking.

DISCUSSION

We have found that prevalence of smoking amongst high school students in the Czech Republic is high and there is no sex difference. It is in consistence with data obtained from the WHO database that shows smoking prevalence between 1997-2001 amongst age group 15-16 years 36% (5). Its increasing trend, in spite of the antismoking campaign and antismoking legislation,

Table 1. *Characteristics of the total examined population (non-smokers and smokers not separated)*

Characteristic	Value
Number of valid questionnaires	419
Average age	17.8 (16-20)
Sex (% men)	45%
Height (cm)	174 (150-205)
Weight (kg)	63.7 (31-90)
% of smokers	37.7%
% of passive smoking (in non-smokers)	29%
Average age at onset of smoking	14 (5-19)

Note: Extreme values in parentheses.

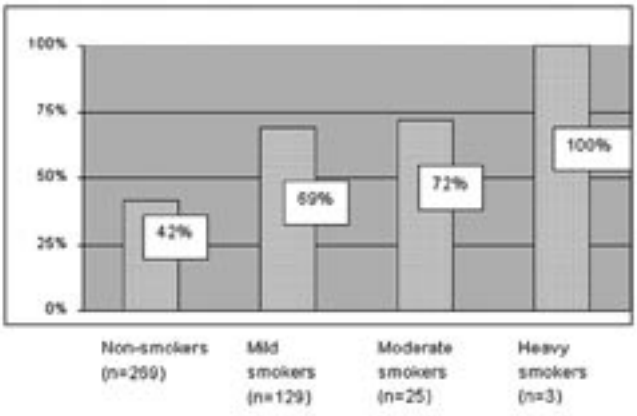

Fig. 1. *Proportion of parents smoking (one or both parents, y axis) among student smokers and non-smokers (x axis). The difference between non-smokers and smokers is statistically significant ($p<0.01$).*

Table 2. *Proportions of smokers according sex and intensity of smoking*

Characteristic	Total (n=419)	Male (n=200)	Female (n=219)	Statistical significance*
Smokers (total)	157 (37.5%)	76 (38.5%)	81 (37.0%)	NS+
Mild (1-10 cig./d)	129 (30.7%)	57 (28.5%)	72 (32.9%)	-
Moderate (11-20 cig./d)	25 (6.0%)	17 (8.5%)	8 (3.7%)	-
Heavy (>20 cig./d)	3 (7.2%)	2 (1.0%)	1 (0.5%)	-

Notes: Column proportions in parentheses.
* Statistical significance of the test comparing two proportions. +NS-not significant.

Table 3. *Proportions of overweight students (BMI>25) by sex*

Characteristic	Total	Smokers	Non-smokers	Statistical significance *
Overweight (BMI>25)				
Total	31 (6.2%)	8 (5.1%)	23 (8.8%)	NS +
Male (n=200)	20 (10.0%)	5 (6.6%)	15 (12.1%)	NS +
Female (n=219)	11 (5.0%)	3 (3.7%)	8 (5.8%)	NS +

Notes: Column proportions in parentheses. There are 76 smokers and 124 non-smokers among males and 81 smokers and 138 non-smokers among females.
+NS – not significant. *Statistical significance of the test comparing two proportions.

Table 4. *Mean BMI (kg/m^2) among smokers and non-smokers by sex*

Characteristic	Total	Smokers	Non-smokers	Statistical significance *
Total (n=419)	21.06 (2.71)	21.07 (2.80)	21.06 (2.67)	NS +
Male (n=200)	21.76 (2.58)	21.76 (2.58)	21.75 (2.60)	NS +
Female (n=219)	20.43 (2.68)	20.50 (2.85)	20.39 (2.58)	NS +

Notes: Standard deviation in parentheses.
* Statistical significance of the t-test comparing two means. + NS – not significant.

Table 5. *The knowledge about smoking hazard, the opinion about the need for a strong antismoking campaign*

Characteristic	Total	Smokers	Non-smokers	Statistical significance *
Knowledge about				
Cardiovascular risk[a]	361 (86.6%)	135 (86.9%)	226 (86.0%)	NS +
Lung cancer[b]	413 (98.5%)	156 (99.4%)	257 (98.8%)	NS +
Extrapulmonary cancer[c]	111 (26.7%)	59 (37.6%)	52 (20.2%)	p<0.01
Need for antismoking campaign[d]	315 (76.1%)	114 (73.5%)	201 (77.6%)	NS +

Notes: Column proportions in parentheses.
* Statistical significance of the test comparing two proportions. + NS – not significant.
[a] The question responded 417 individuals, 157 smokers and 260 non-smokers. [b] The question responded 418 individuals, 157 smokers and 261 non-smokers.
[c] The question responded 415 individuals, 157 smokers and 258 non-smokers. [d] The question responded 414 individuals, 155 smokers and 259 non-smokers.

Table 6. *Smoking and experience with alcohol, soft and hard drugs*

Characteristic	Total	Smokers	Non-smokers	Statistical significance *
Alcohol[a]	359 (85.7%)	155 (98.7%)	204 (77.9%)	p<0.01
Marihuana[b]	88 (21.2%)	64 (40.8%)	24 (9.3%)	p<0.01
Hard drugs[c]	22 (5.4%)	18 (12.0%)	4 (1.6%)	p<0.01

Notes: Column proportions in parentheses.
* Statistical significance of the test comparing two proportions.
[a] The question responded 419 individuals, 157 smokers and 262 non-smokers.
[b] The question responded 416 individuals, 157 smokers and 259 non-smokers.
[c] The question responded 405 individuals, 150 smokers and 255 non-smokers.

is even more disturbing. Between 1993-1996 the prevalence was 26% and the increase involves both males and females. On the other hand smoking prevalence in adults dropped from 36% to 29% according this source. We are concerned because adult smokers recruit mainly amongst young people and a significant increase in adult prevalence can be expected in near future.

In other countries the smoking prevalence in teen population is also high but the prevalence in the Czech Republic belongs to the highest. E.g. in Sweden it was 25% in 1997-2001 with decreasing trend, in UK 26%, in Spain 30% or in Hungary 28%. According the National Youth Tobacco Survey the smoking prevalence ranges from 15.1% amongst middle school students to 34.5% amongst high school students in the U.S.A. (6, 7).

We are also worried about the frequency of passive smoking. The number of non-smokers exposed to environmental tobacco smoke together with smokers forms almost 2/3 of all students.

The average age of smoking initiation is 14 years in consistence with the literature. According Sieminska and colleagues

the average age of smoking initiation was 13 years for boys and 15 years for girls (1). Most of smokers start smoking early in adulthood, according to Najem et al. before the age of 16 years (8). According to the Department of Health and Human Services in Atlanta approximately 80% of tobacco users initiate smoking before age 18 years (9). The primary target for the antismoking campaign are thus young people and since the youngest age of smoking initiation was 5 years in our survey, it should start already in childhood.

The WHO guidelines specify the intervention of health care professionals (10). The brief intervention of all levels of health care consists of 5 A (ask, advise, assess, assist, arrange follow up). Specialists in smoking cessation provide more intensive support including individual or group therapy and pharmacotherapy. However guidelines lack specific recommendation for children and young people, the most important recruiting pool of smokers. We think that an intensive antismoking campaign should be provided in schools, starting already in early age. The cooperation between health care professionals and teachers is essential. We have tried to help the antismoking campaign by performing this research and presenting results together with information of deleterious effect of tobacco smoke and illustrative numbers of tobacco victims and pictures of seriously ill patients. This campaign should be sustained. Another level is prenatal care. Education in family planning should include the information about tobacco hazards, too. Legislation against tobacco advertising, smoking in public place and sale of tobacco products to children should be enforced.

We have not found more overweight students among smokers. The mean BMI was 21.07 for smokers and 21.06 for non-smokers, proportion of overweight student was slightly higher for non-smokers than for smokers (8.8%, resp. 5.1%).

We have shown that parents smoking are significantly more frequent in teen-age smokers than in non-smokers. We conclude that the primary target for the antismoking campaign should be simultaneously present in future parents. We think that harming their children might be a strong impulse for smoking cessation in parents. Many girls stated as a motivation for smoking cessation future pregnancy. On the other hand the information about health hazards of smoking among students was good with the exception of knowledge about cancer of extrapulmonary locations. High percentage of students also wrongly considers "light" cigarettes to be healthier. Students in spite of knowing the risk of tobacco do smoke. Surprisingly smokers were better informed about the risk of cancer of extrapulmonary locations. We conclude that plain information about smoking hazards may be a subthreshold motivation and ways to reach the threshold should be sought for (e.g. seeing and talking to dying patients in hospitals). We tried to find out reasons for smoking. The peer group pressure seems to be the strongest motivation. According to Pinilla et al., who performed a more extensive analysis of smoking in schools, better enforcing no smoking rules may be effective (11).

Young smokers also reported more frequent use of alcohol, marihuana or hard drugs. Smoking seems to be a factor showing higher risk behaviour. The education should not include only an antismoking campaign but also information about other illicit substances and about healthy life style.

Our survey is a pilot study. It was performed before the WHO initiative GYTS (Global Youth Tobacco Survey) started. This survey will bring more detailed information about the tobacco use. The alcohol and other drug use are also an important problem that merits a more thorough attention that we were not able to accomplish in this survey.

CONCLUSION

The prevalence of active and passive smoking amongst high school students is high. The apprehension of health risk associated with smoking is incomplete, but the apprehension alone is insufficient to change the risk behaviour.

Parents' smoking is significantly more frequent in teen-age smokers than in non-smokers. The risk of alcohol and other drug use is significantly higher in smokers than in non-smokers.

We consider the "teen age" population together with their parents to be the key target for a successful antismoking campaign. Future parenthood could be a strong positive motivational re-enforcement. A change of peer group pressure as a strong smoking motivation could induce a decline in smoking prevalence. However how to induce this changes remains a challenge.

Acknowledgements

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