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ORIGINAL ARTICLE

Tobacco smoking in adolescents with cancer

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Abstract

Background: The purpose of the study is to compare smoking tobacco frequency and features in adolescents with and without cancer from a single medical institution in Mexico City. **Procedure**: This is a comparative, transversal study. The analysis defined as an adolescent (12-18 years old) with a histopathology diagnosis of cancer in the treatment and/or follow-up who answered a questionnaire. A control group was defined as a healthy adolescent with no cancer diagnosis and that answered the questionnaire. **Results**: A total of 385 adolescents were included, 276 belonged to the control group and 109 were cases. From the total population, 57 admitted to being regular smokers: 38 in the control group and 19 in the patient group. The subjects were stratified as those between 12-15 years old (n = 247) and 16-18 years (n = 138). Acute lymphoblastic leukemia was the single most common entity, presenting 6/27 patients with smoking habits. Adolescents under 15 years old smoked significantly less (n = 17) than those over 15 (n = 39) (P = 0.0001). **Conclusion**: The proportion of smokers was similar between groups. 70% of patients with cancer who smoked began before the disease; however, only 31.6% continued to do so during treatment. The medical community should work harder with adolescents about the health hazards and addiction to tobacco. **Conclusione**: La proporcion de fumadores fue similar entre los grupos. 70% de los pacientes con cancer comenzaron a fumar antes de su enfermedad; sin embargo solo el 31.7% continuo haciendolo durante su tratamiento. La comunidad medica deberia trabajar arduamente con los adolescentes acerca de los problemas de salud que conlleva la adiccion al tabaco.

Key words: Smoking. Adolescence. Case-control.

Tabaquismo en adolescentes con cáncer

Resumen

Antecedentes: Comparamos la frecuencia y las características de tabaquismo en adolescentes con y sin cáncer de una única institución en la ciudad de México. **Procedimiento**: Se trató de un estudio comparativo y transversal. En este análisis se definió como un adolescente (pacientes de 12 a 18 años de edad) con un diagnóstico histopatológico de cáncer en tratamiento y/o en seguimiento quienes respondieron el cuestionario. Un control fue definido como un adolescente sano sin diagnóstico de cáncer y que respondió el cuestionario. **Resultados:** 385 adolescentes fueron incluidos. 276 pertenecieron al grupo de control y 109 fueron casos. Del total de la poblacion, 57 admitieron ser fumadores regulares: 38 en el grupo control y 19 en el grupo de casos. Los sujetos fueron clasificados como aquellos entre 12-15 años (n = 247) y 16-18 años

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(n = 138). La leucemia aguda linfoblástica fue la entidad mas común. Presentándose en 6/27 pacientes, con hábitos de tabaquismo. Adolescentes debajo de 15 años mostraron tabaquismo significativamente menor (n = 17) que aquellos por encima de 15 años (n = 39) (p = 0.0001).

Palabras clave: Tabaquismo. Adolescencia. Casos-controles.

Introduction

Smoking is a preventable risk factor associated with many diseases. It is associated with 16% of deaths in developing nations¹. Schaefer² reported that 52% of adults who smoked started between 12 and 17 years old. Some authors have studied the survivors of cancer noting an increased risk of cardiometabolic events. sedentary lifestyle, alcohol, and tobacco consumption compared to the general population. Despite knowing these risks, 17-20% are active tobacco smokers³⁻⁵. This represents the biggest risk factor among adolescents that are receiving treatment for cancer. In Mexico, the 2011 National Survey estimated that 100,000 people under the age of 21 become addicted to tobacco each day⁶. Among Mexican students, 42% between the ages of 13 and 15 have consumed tobacco at least once, of which 14.6% are current smokers with a discrete prevalence in males and 3.7% are addicted⁶.

In view of this current worldwide problem in adolescents, we decided to compare the frequency of smoking in adolescents with cancer and healthy adolescents.

Methods

This is a comparative and transversal study conducted at the National Institute of Pediatrics in Mexico City. Adolescents with cancer from the oncology department and healthy adolescents from a public and a private high school in Mexico City from September 2013 to February 2015 were included in the study. We defined an adolescent over 12 and under 18 years old. Adolescent patients included those with any gender with a histopathology diagnosis of cancer of our institution in any phase of treatment who were able to answer a questionnaire.

An adolescent control was defined as a healthy person of any gender with no cancer diagnosis who was able to answer the questionnaire. All were from Mexico City.

Parents or teachers were included in all surveys. All parents of the teens agreed to conduct the interview in a written format. It was documented whether the patient had ever smoked and the information related with the tobacco use. To estimate the prevalence, we used the following parameter p = 0.14, q = 0.86, $\alpha = 1.96$, and

e = 0.05. A sampling by convenience of included patients was performed in a sequential manner and two controls for each case, to establish a comparison and avoid bias. The protocol was accepted by the Ethics and Research Committee such that any person who admitted smoking was referred to a medical council to receive information on health risks.

Descriptive analysis was performed with measures of central tendency and dispersion. Comparison between the categorical variables was carried out with the Chi-square test, with p-values < 0.05 considered to be statistically significant.

Results

A total of 385 adolescents were included: 276 belonged to the control group and 109 were cases. The mean age was 14.83 (12-18) years. From the total population, 57 admitted to being regular smokers, of which 38 were controls and 19 were patients.

We stratified the subjects into two groups by age: 12-15 years (n = 247) and 16-18 years (n = 138). Adolescents under 15 years old smoked significantly less (n = 17) than those over 15 (n = 39) (p = 0.0001).

Concerning the age at which they smoked their first cigarette, there was no significant difference between the two age groups (p = 0.088). In both the patient and control groups, there were two children who smoked for the 1st time at age 9. The average age for home consumption was 13.8 years (9-17, standard deviation 16.26). In the group of patients with cancer (109), 50 (45.8%) were female, compared with the control group, of which 153 (55.4%) were female. Approximately 69 (63.3%) patients in the patient group were 12-15 years old compared with 178 (64.5%) of the controls. 33.9% of cancer patients were diagnosed with leukemia and the remaining had solid tumors. 19 cancer patients (17.4%) smoked compared to 38 controls (13.8%), not statistically significant. In 90% of subjects in both groups, the person who introduced them to the habit were friends (Table 1). In both groups, up to 84% of the subjects had family members who consumed tobacco. Despite this, 65.8% of teens in the control group felt that their family did not know about their smoking habits, in

| Characteristics | Patients with cancer, n = 109 (%) | Healthy controls, n = 276 (%) | p value |
|---|---|---|---------|
| Gender Female Male | 50 (45.8) 59 (54.2) | 153 (55.4) 123 (44.6) | 0.090 |
| Age 12-15 16-18 | 69 (63.3) 40 (36.7) | 178 (64.5) 98 (35.5) | 0.800 |
| Smoking Yes No | 19 (17.4) 90 (82.6) | 38 (13.8) 238 (86.2) | 0.300 |
| Who offer the cigarette for the 1 st time Friends Parents/family Own initiative | n = 19 17 (89.5) 1 (5.3) 1 (5.3) | n = 38 34 (89.5) 3 (7.9) 1 (2.6) | 0.800 |
| Smokers among parents/family Yes No | 16 (84.2) 3 (15.8) | 36 (94.7) 2 (5.3) | 0.100 |
| Knowledge by relatives Yes No | 14 (73.7) 5 (26.3) | 13 (34.2) 25 (65.8) | 0.005 |
| Drinking alcohol Yes No | 7 (36.9) 12 (63.1) | 20 (52.6) 18 (47.4) | 0.200 |
| Types of cancer Leukemia Solid tumors | 37 (33.9) 72 (66.1) | Not apply | _ |
| Onset of smoking in relation to treatment Before diagnosis During treatment | 13 (68.4) 6 (31.6) | Not apply | |

Table 1. Features of healthy teenagers and adolescents with cancer in Mexico City

contrast to cancer patients, of whom only 26.3% felt that their parents did not know. Alcohol consumption in conjunction with tobacco was higher in healthy adolescents (52.6%) compared to patients (36.9%).

Discussion

Our findings were similar to that described internationally. In our population of 385 adolescents, 14.8% had a smoking habit. In a meta-analysis from 2003 to 2011, Caleyachetty⁷ described a prevalence of the smoking of 12.1% among adolescents. The National Survey of Tobacco among adolescents in Mexico reported 14.6%⁶.

Of the patients who were included in this study, 73.7% of the relatives of cancer patients knew about their consumption of tobacco compared to 34.2% of the healthy adolescents. It is striking that the family's knowledge of the diagnosis of cancer did not affect tobacco use in these adolescents. In literature, we found that the longer the exposure to tobacco in teens, the greater the probability of more intense patterns of consumption⁸. Substantial proportions of adult Japanese cancer survivors continue smoking after the diagnosis of cancer, and the majority are not provided with relevant information about this addiction⁹. Most pediatric oncologists know that cancer survivors can be less educated and can have life dissatisfaction and high stress^{10,11}. The need for education on this matter is an essential issue^{12,13}. This task should include not only pediatric oncologists but also primary care physicians in a multidisciplinary approach¹⁴.

Hudson¹⁵ found that the prevalence of alcohol consumption (72.5%) was higher in healthy adolescents compared with cancer survivors (< 10%). However, it was recently reported that Hispanic childhood cancer survivors exhibit increased risk, including alcohol consumption, although this was not as prevalent in Caucasians¹⁶.

It is known that there is a greater reduction of tobacco consumption in adolescents with cancer compared to the general population⁵. Only 8% continue smoking during treatment⁵. The pattern of tobacco consumption in cancer patients decreases overtime from 20% to 9%

9 years after the diagnosis¹⁷. The main limitation of this study is its cross-sectional design and its low representation of the national population, including only adolescent cancer patients in Mexico City.

Conclusion

In spite of educational campaigns to reduce tobacco consumption in young people, it is an unsolved problem. In adolescent patients with cancer, the usage continues to be similar to the healthy population. In this group, the use of tobacco is a major risk factor due to antineoplastic drugs and their toxicity. It is known that tobacco consumption interferes with pubertal development, predisposing users to the development of some neoplasms at early stages of life. Tobacco use prevention campaigns at school and in the general media should focus on the adolescent population, specifically patients with various types of malignancies.

Contributorship statement

- Zapata-Tarrés Marta: a study design, statistical analysis, and drafting the manuscript.
- Velasco-Hidalgo Liliana: a study design, statistical analysis, and drafting the manuscript, Cárdenas-Cardós Rocío: a study design, statistical analysis, and drafting the manuscript.
- Ochoa-Drucker Cecilia: do surveys of healthy children and cancer patients, performing database,
- Duarte-Arroy Luisa María: do surveys of healthy children and cancer patients, performing database.
- Rivera-Luna Roberto: a study design and drafting the manuscript.

Competing interest

None.

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None.

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