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ORIGINAL

Educational intervention on lung cancer risk factors

Intervención educativa sobre factores de riesgo del cáncer de pulmón

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ABSTRACT

A quasi-experimental study of educational intervention on lung cancer risk factors was carried out at the Family Medical Office 21 of the "Pedro Borrás" University Polyclinic in Pinar del Río in the period December 2023 - November 2024. The study universe consisted of all patients who presented risk factors for lung cancer in the health area (275 cases). The sample was assumed to be 78 patients who met the inclusion and exclusion criteria. As a starting method, the questionnaire was used to measure the level of knowledge in relation to lung cancer risk factors, implementing it before and after the intervention, in order to achieve the comparative states of knowledge acquired by the sample. At the end of the study, a significant increase in the level of knowledge was achieved and with-it effective preventive behavior in the health area. At the end of the research, it was determined that there was a prevalence of cases between 51 and 61 years of age, with a predominance of males, workers and housewives, with a prevalence of risk factors where personal history of bronchitis and smoking habits stood out. A 28 % of cases were recognized with a first-generation hereditary association. The author concludes that educational intervention becomes a tool for primary health care, which provides effectiveness in modifying knowledge, raising health indicators.

Keywords: Lung Cáncer; Educational Intervention; Risk Factors.

RESUMEN

Se realizó un estudio cuasi-experimental de intervención educativa sobre los factores de riesgo del cáncer de pulmón en el Consultorio Médico de la Familia 21 del Policlínico Universitario "Pedro Borrás" de Pinar del Río en el período diciembre 2023 – noviembre 2024. El universo de estudio estuvo formado por todos los pacientes que presentaron factores de riesgo de cáncer de pulmón en el área de salud (275 casos). Se asume como muestra a 78 pacientes que cumplieron con los criterios de inclusión y de exclusión. Como método de partida se utilizó el cuestionario para medir el nivel de conocimientos en relación con los factores de riesgo el cáncer de pulmón, implementándolo antes y después de la intervención, a fin de lograr los estados comparativos de conocimiento adquirido por la muestra. Se logró al término del estudio una elevación significativa del nivel de conocimientos y con ello una eficaz conducta preventiva en el área de salud. Al término de la investigación se determinó que existió una prevalencia de casos entre 51 a 61 años con prevalencia del sexo masculino, trabajadores y amas de casa, con prevalencia de factores de riesgo donde destacaron los antecedentes personales de bronquitis y el hábito de fumar. Se reconoció un 28 % de casos

con asociación hereditaria de primera generación. El autor concluye la intervención educativa se convierte en una herramienta para la atención primaria de salud, que aporta efectividad en la modificación de conocimientos, elevando los indicadores sanitarios.

Palabras clave: Cáncer de Pulmón; Intervención Educativa; Factores de Riesgo.

INTRODUCTION

Cancer is the leading cause of death in the world, with more deaths than ischemic heart disease or any other group of specific diseases. This year, it is estimated that there will be around 19,3 million new cases of cancer and 11,4 million deaths from the disease, and the figures will increase by 59 % and 68 %, respectively, in less developed regions.[1]

Lung cancer is, to a large extent, a disease of modern man. Before 1900, it was considered a rarity; less than 400 cases were mentioned in the medical literature.[2]

It claims more lives each year than all cancers of the colon, prostate, ovary and breast combined. It constitutes a significant social challenge and is a disease with substantial economic, social, and emotional repercussions.[3]

Lung neoplasms persist as a challenge for medicine because, despite advances in diagnostic techniques and therapeutic resources, treatment results remain poor, as evidenced by the low number of cures and the number of patients treated.[4]

According to the World Health Organization (WHO), this neoplasm includes all primary malignant epithelial tumors of the lung, excluding pleomorphic, sarcomatoid, and carcinoid tumors and those derived from the salivary glands.[4]

Worldwide, lung cancer is considered the most lethal of all cancers, followed by cancer of the breast, colon and rectum, stomach, and liver. It most commonly affects people between the ages of 50 and 60, with smoking being the risk factor most strongly associated with the development of this type of cancer.[5,6,7,8,9,10]

It is essential to highlight that lung cancer was the most commonly diagnosed cancer in 2021 (in 2019, it was the second most widely diagnosed), which indicates a progressive increase in this cancer among women.[11,12] This could be explained by the fact that women tend to take up smoking at a later age than men and that there is a latency period of approximately 20 years between exposure to tobacco carcinogens and the possible development of the disease.[13]

Lung cancer continues to be the most common cancer in men in Central and Southern Europe, as well as in Eastern Europe, North America, and East Asia, with the lowest rates being recorded in Central and West Africa. (2,8 and 3,1 per 100 000), respectively. In women, incidence rates are generally lower. Still, worldwide, lung cancer is currently the fourth most common cancer in women (516 000 cases, 8,5 % of all cancers) and the second most common cause of cancer death (427 000 deaths, 12,8 % of the total), the highest incidence rate is observed in North America where lung cancer is the second most common cancer in women, and the lowest in Central Africa.[14]

According to the 2016 Statistical Yearbook of the Ministry of Public Health of the Republic of Cuba, updated with data from the National Cancer Registry, the incidence rate of lung cancer in males was 60,3/100 000 inhabitants, while in females it was 30,5/100 000 inhabitants, with some 5 100 deaths occurring in 2016 due to this neoplasm (3 274 in males and 1 826 in females), with a rate of (45,4 %).[15,16,17]

According to the most recent Statistical Yearbook of Health, published in 2020 and corresponding to 2019, cancer was the second leading cause of death in Cuba at that time, with heart disease in first place.[16,17,18]

The pathological, biochemical, physiological, and social phenomena associated with the development of a disease have been identified as risk factors. Active and passive smoking, alcohol consumption, age, sex, a history of chronic respiratory diseases, as well as occupational exposure to carcinogenic substances by inhalation, are major risk factors in the onset of this neoplasm.[18,19,20,21,22,23,24,25]

In Cuba in 2019, it was the second leading cause of death, with 25,035 deaths from this cause for a rate of 223,0; in the province of Holguín, 2 168 patients died from this cause for a rate of 210,0, and in the municipality of Banes in the same year it also ranked second among causes of death with a rate of 240,0 per 100 000 inhabitants.[26,27,28]

Lung cancer is a group of diseases resulting from the malignant growth of cells in the respiratory tract, particularly in the lung tissue. It is one of the most common types of cancer worldwide. It usually originates from epithelial cells and can lead to metastasis and infiltration into other tissues in the body. Lung cancer excludes those neoplasms that metastasize to the lung from tumors in different parts of the body.[26,27,28]

Lung cancer is classified into two main types based on the size and appearance of the malignant cells: small-cell lung cancer (microcytic) and non-small-cell lung cancer (non-microcytic). This distinction determines the

treatment; thus, while the former is generally treated with chemotherapy and radiation, the latter tends to be treated with surgery, laser, and, in select cases, photodynamic therapy.

To date, there is no specific clinical picture for the diagnosis of lung cancer; however, symptoms such as cough (present in more than 65 % of patients at the time of diagnosis), hemoptysis, dyspnea, chest pain, weight loss, and fatigue are symptoms and signs that, if they persist for more than three weeks, should be evaluated with a chest X-ray.[28,29]

The leading causes of lung cancer, as well as cancer in general, include carcinogens such as cigarette smoke, ionizing radiation, and viral infections.

As the damage becomes more extensive, the likelihood of developing cancer increases. The most common cause of lung cancer is smoking, with 95 % of lung cancer patients being smokers or ex-smokers. In non-smokers, the onset of lung cancer is the result of a combination of genetic factors, exposure to radon gas, asbestos, and atmospheric pollution, including second-hand smoke (passive smoking).[30]

The symptoms and signs can be grouped into the following sections:[31,32,33,34,35,36,37]

- Local respiratory symptoms: cough, difficulty breathing, chest pain, hemoptysis, and dysphonia.
- General symptoms: weight loss, asthenia, and anorexia that generally appear in the advanced stages of the disease.
- Symptoms derived from metastasis:
  - ✓ Liver involvement: jaundice, abdominal pain in the right upper quadrant of the abdomen, and signs of liver failure. This is the most common.
  - ✓ CNS involvement: present in 10 % of cases at diagnosis in small cell tumors. They generate a wide range of symptoms, including behavioral changes, headache, motor paralysis of the extremities, and even coma.
  - ✓ Bone involvement: bone pain is typical of metastatic lesions that settle in the bone, in order of frequency in the vertebrae, pelvis, long bones (humerus, ulna, radius, femur, tibia, and fibula), and ribs.
  - ✓ Superior vena cava syndrome: 12 % of lung cancer patients present this syndrome. It is due to compression and/or thrombosis of the superior vena cava by direct invasion of the tumor or the surrounding lymph nodes. This syndrome is identified by neck, head, and right upper limb swelling, with a very marked dilation of the veins in these areas.

Given that the lung is a large organ, there are usually no symptoms in the initial stages of a tumor. Generally, when the first signs appear, the disease has already advanced. In addition, in many cases, the symptoms caused by lung tumors are nonspecific and are associated with diseases that have nothing to do with lung cancer. For this reason, it is advisable to go to the primary care doctor when some of these symptoms appear, especially if they last a long time, to make an early diagnosis and provide the most appropriate treatment.[39,40,41,42,43,44]

Notes on the risk factors for lung cancer. The strains most related to cigarette smoking are the small and squamous cells. Adenocarcinoma, which is predominant in women and less associated with tobacco consumption, has experienced a significant increase almost worldwide, to such an extent that in the USA and Asian countries, it is the most frequent type. In many countries, it is the predominant type, even among men. Despite the fact that the epidermoid type has decreased in Spain and other southern European countries, it is still the most common, with percentages between 35 and 60 %. A high cumulative tobacco consumption is essential in developing the small cell type.[45,46]

Tobacco continues to be the leading risk factor related to PC. According to Takkouche B, Gestal-Otero JJ, there are other risk factors, some exogenous in addition to tobacco, such as atmospheric and urban pollution, occupational exposure to carcinogens, etc., and endogenous factors such as sex, race, personal or family history.[47]

The relationship between tobacco consumption and lung cancer is indisputable, and, as we have already said, it is the leading risk factor for the development of this cancer. Most cases occur in smokers, and it is estimated that the average number of years of life lost due to tobacco consumption is 15 years. xxiv All histological types of LC are related to tobacco smoke. However, the association is more significant in squamous cell and small cell carcinomas and less so, classically, in adenocarcinomas and large cell carcinomas. Recent studies have shown that the incidence of lung adenocarcinoma in smokers has increased while that of epidermal cancer is decreasing, and this could be attributed, among other things, to substantial changes in the components of cigarettes.[48,49]

In the health area of the "Pedro Borrás" University Polyclinic, a population of 26 people has been diagnosed with lung cancer.

METHOD

Theoretical methods:

- Historical-Logical: This was used to analyze and determine the historical background and

theoretical-methodological foundations for the research development.

- Analysis and Synthesis: Its application allowed us to reveal the current nature of the problem under investigation and to analyze and synthesize the data and information related to knowledge about the risk factors for lung cancer.
- Induction-Deduction: made it possible, based on the inadequacies detected, to generalize the criteria of the inadequacies in the subject of study.

Empirical methods:

- Document review: used to obtain necessary information on the population at risk of lung cancer in the Health Area, specifically CMF.
- Questionnaire: this was used as the primary source of information when evaluating the level of knowledge about the risk factors for lung cancer in the pre-test (before) and post-test (after) mode, thus revealing the transformation in the level of knowledge about the subject of study.

Mathematical-statistical methods:

Descriptive statistics were used based on absolute frequencies in the corresponding variables and relative frequencies, using a percentage calculation procedure. In addition, McNemar's test was applied to evaluate the significance of the transformation in the sample's level of knowledge.

RESULTS

In the case study series, patients in the 51 to 61 age group prevailed with 41,3 %, with a male prevalence of 54,6 %.

In the research by Mahuad R, Pezotto E, and Poletto L, when analyzing the average age at diagnosis for lung cancer and patients at risk, an average of 59±1,6 years was observed. This coincides with the peak age obtained in the statistics of the present investigation.

Moctezuma Velazco CR and Patiño Zarco M[27] state that the risk of developing or dying from lung cancer in patients at risk increases dramatically after the age of 40. Lung cancer mortality rates increase after the age of 40 in direct relation to tobacco consumption. This is an issue with which the researcher entirely agrees.

The male/female ratio in Cuba, although less pronounced than in previous years, is still high. Among the non-smoking population, the incidence of lung cancer is higher in women. Furthermore, it seems that women may be more vulnerable to the carcinogenic effect of tobacco, although there is controversy on this point, as Edell ES and Cortese DA point out.[30]

The researcher concludes that increasing age increases the risk of suffering from lung cancer, this being directly proportional to a more extended period of exposure to the different risk factors. In addition, he points out that, according to the theoretical references consulted, the incidence of females in this type of neoplasm is elevated in international statistics, thus supporting the scientific findings.

According to occupation, working patients prevailed in 28,4 % of the case study series, followed by housewives in 25,3 %.

Carrillo de Santa Pau E's doctoral thesis proposes[31] that occupational factors such as exposure to asbestos, fibrous silicates with a crystalline structure, also known as asbestos, ionizing radiation, smoke of different kinds, etc., are important factors implicated in the development of lung cancer.

It has been proven that occupational exposure to inhaled coal combustion products causes lung cancer, and currently, recent studies show similar effects with the domestic use of coal.[32] However, at the moment, there is limited scientific evidence of an increased risk of lung cancer from exposure to smoke from biomass combustion (mainly wood and straw) and kitchen fumes involving homemakers.[33]

Between 80 and 90 % of lung cancer cases are attributed to smoking.[34] The other 10 to 20 % have a multifactorial etiology involving various carcinogens and genetic and environmental factors. In this case, occupational and labor factors are expressed since the worker, in general, can be exposed to invisible and odorless substances and gases, which seep through the soil and are diffused into the air of the work environment, according to Wynder EL, Graham EA.[35]

For the author, both international and national statistics are inconclusive about the occupational impact on the appearance of lung cancer. Still, the existence of the risk factor is confirmed, affecting workers and homemakers fundamentally, which supports the study's results.

The prevalence of clinical-chemical-environmental factors was demonstrated, those categorized as active and passive smokers, as well as pathological antecedents that contribute to the risk of lung cancer, with 72,6 % of the study cases.

Numerous studies have shown that, when smoking is stopped, the risk of developing lung cancer decreases by more than 90 % after 30 years of abstinence. If tobacco consumption is interrupted before the age of 30, mortality from this neoplasm decreases and becomes almost the same as that of the population that has never

smoked.[39,40] Around three-quarters of patients who undergo surgery for lung cancer have been active smokers, and almost half of them stop smoking; however, there is a subgroup of patients who continue to smoke.[41,42] It is here that an increase in the recurrence of lung cancer of close to 20 % is observed, with a decrease in survival and an increase in the development of second primary cancers due to smoking as a primary risk factor, as pointed out by Lee JS, Lippman SM, Benner SE, Lee JJ, Ro JY, Zuckerman JM, et al.[43]

Therefore, it is recommended to quit smoking, if possible, before being diagnosed with lung cancer and, if diagnosed with the disease, to eliminate the habit even more.

These bibliographic sources are sufficient for the author to confirm that the prevalent risk factors in cases of lung cancer are mainly associated with smoking. The clinical-chemical-environmental factors in the present study corroborated this.

It was shown that 20 % of the sample had a good level of knowledge about the signs and symptoms of lung cancer before the intervention.

After the participatory activities, this percentage rose considerably to 94,3 % of the case series. All this is endorsed by Mc Nemar, in which an X2C of 63,64 is obtained, a significant value for a degree of freedom, demonstrating the level of knowledge the patients reached after the educational intervention.

Regarding health education concerning the fundamental signs and symptoms of lung cancer, the SEOM,[49] actively participates in the promotion of health outreach initiatives and projects in favor of cancer patients and their families. In this direction, they point out that communication, instruction, and education about the characteristics of the neoplasm are fundamental when carrying out community interventions, in which success is expected.

In noting these references, the author considers not only the change in the level of knowledge about lung cancer in the patients under study valid but also that it is important to train general practitioners about the initial symptomatology of the disease and the procedures or initial studies that patients should undergo whose risk factors and symptomatology indicate a high diagnostic suspicion of lung cancer.

It was shown that prior to the intervention, 16,7 % of patients had good knowledge of the risk factors for lung cancer, while after the educational activities, this rose to 96,5 %.

Educational activities related to prevention and health promotion should inform at-risk patients and those not at risk about future activities related to raising awareness of risk and protective factors that distinguish potential causes of lung cancer. This stems from the fact that there is a regular, low level of health information and education in vulnerable groups at the community level, as stated by Crawford ED, Moul JM, Rove KO, Pettaway CA, Lamerato LE, Hughes A.[54,55,56,57]

For the author, it has been validated that structured educational interventions aimed at preventing the risk of lung cancer are effective to the extent that they take into account an accurate diagnosis of vulnerable and at-risk populations, as is the case in the present study.

CONCLUSIONS

At the end of the research, to increase knowledge about the risk factors for lung cancer, it was determined that there was a prevalence of cases between 51 and 61 years of age with a prevalence of males, workers, and homemakers, with a prevalence of clinical-chemical-environmental risk factors: mainly a personal history of bronchitis and smoking. 28 % of cases were recognized as having a first-generation hereditary association.

The author concludes that community education through educational intervention becomes a tool for primary health care, which is effective in modifying knowledge about the risk factors for lung cancer, rightly raising health indicators, especially in the work of addressing risk factors in vulnerable populations, a fact corroborated in the case of the risk factors for lung cancer in the present research concluded.

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