Available online at www.sciencedirect.com
ScienceDirect
Cancer Letters 248 (2007) 41–46
CANCER Letters
www.elsevier.com/locate/canlet

Relationship between lung cancer and human papillomavirus in north of Iran, Mazandaran province

Seyed Alireza Nadji [a,b,*], Talat Mokhtari-Azad [a], Mahmood Mahmoodi [a], Yousef Yahyapour [a], Farshad Naghshvar [c], Jila Torabizadeh [c], Abed Ali Ziaee [d], Rakhshandeh Nategh [a]

[a] *Virology Division, Department of Pathobiology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran*
[b] *Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran*
[c] *Imam Khomeini Hospital, Department of Pathology, Mazandaran University of Medical Sciences, Sari, Iran*
[d] *Institute of Biochemistry and Biophysics, Tehran University, Tehran, Iran*

Received 6 May 2006; received in revised form 23 May 2006; accepted 26 May 2006

Abstract

Lung cancer is a major health problem and the leading cause of cancer deaths in the world. The pathogenesis of lung cancer is complex, and is believed to be due to the interaction between environmental and genetic factors. Various evidences show that HPV might be involved in bronchial carcinogenesis. In this study, 141 lung cancer patients and 92 non-cancer control subjects were enrolled to examine whether HPV DNA existed in lung tumor and normal tissues in Mazandaran, north part of Iran by nested PCR. Our data showed that 33 of 129 lung tumors had HPV DNA compared with 8 of 90 non-cancer control subjects (25.6% vs. 9.0%, $P = 0.002$). The infection of HPV had an OR of 3.48 (95% CI 1.522–7.958; $P = 0.002$). Meanwhile infection of high risk HPV types (16 and 18) had a significantly high OR of lung cancer incidence as 8.00 (95% CI 1.425–44.920; $P = 0.021$) compared with 4.423 (95% CI 2.407–8.126; $P \leqslant 0.0001$) of smoking status. This result suggests that HPV infection is associated with lung cancer development in Mazandaran, Iran.
© 2006 Elsevier Ireland Ltd. All rights reserved.

Keywords: Lung cancer; Human papillomavirus (HPV); HPV type; Iran

1. Introduction

Lung cancer has been the most common cancer in the world since 1985, and by 2002, there were representing 12.4% of all new cancers. It was also the most common cause of death from cancer, with 17.6% of deaths the world total [1]. In the USA, it has been the leading cause of cancer deaths in men in the past five decades, and since 1987 has overtaken breast cancer as the leading cause of

Abbreviations: HPV, human papillomavirus; PCR, polymerase chain reaction; SD, standard deviation; OR, odds ratio; CI, confidence interval; LCLC, large cell lung carcinoma; AdC, adenocarcinoma; SQC, squamous cell carcinoma; LCC, large cell carcinoma; SCLC, small-cell lung carcinoma.

* Corresponding author. Tel.: +98 9123802639; fax: +98 21 88736077.
E-mail address: sarnadji@razi.tums.ac.ir (S.A. Nadji).

0304-3835/$ - see front matter © 2006 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.canlet.2006.05.016

cancer death in women. It currently accounts for 27% of all cancer deaths in women each year, which is more than cancer deaths due to breast, colon and rectum combined [2]. In Europe, lung cancer is also a leading cause of cancer mortality, accounting for 28% of cancer deaths in men and 10% of cancer deaths in women [3].

For almost 30 years no population-based cancer statistics have been available with which to estimate the cancer burden in Iran. In 2002 and 2003, two separate reports of population-based cancer registries were published from Iran and suggest that the incidence of lung cancer is very low [4]. According to the Annual Reports of Health Research Station of Babol city, School of Public Health, Tehran University of Medical Sciences, lung cancer was representing 2.8–4.6% of all new cancers in Mazandaran province from 1999 to 2004 (data is not published).

Human lung cancers are classified into two major types, small-cell lung cancer (SCLC) and non-small-cell lung cancer (NSCLC), the latter consisting of several types [5].

The pathogenesis of lung cancer is complex, and is believed to be due to the interaction between environmental and genetic factors. Environmental tobacco smoke, cooking oil vapors, indoor smoky coal burning and infection with tuberculosis and human papillomavirus are risk factors in different populations. The interactions between different genes and environmental factors are beginning to be appreciated and should be further elucidated [6]. Although tobacco smoking is the most important environmental risk factor for the development of lung cancer but high rate of lung cancer despite a low prevalence of smoking in some population have provided useful information on risk factors other than smoking [7]. This is emphasizing the importance of the search for additional aetiological and risk factors.

HPV has been shown to be implicated in human neoplasm including uterine cervix, vulva, skin, esophagus and head and neck [8]. According to the present data, HPV is most commonly associated with the development of cervical carcinomas and HPV 16/18 are the types most frequently detected in high-grade squamous intraepithelial lesions and invasive carcinomas.

Clearly, the epidemiological and morphological observations, the detection of HPV DNA in lung cancer and in vitro studies are in agreement with the concept that HPV might be involved in bronchial carcinogenesis [9]. The detection rates of HPV in lung carcinomas are subject to wide variations. In a review of 85 studies [9] and some others [10,11] recording about 2739 cases described a detection rate of 22.16%.

In this study, we tried to address the question of a viral aetiology of lung cancers by investigating of HPV genome in a series of 233 cases of lung carcinomas and controls with PCR and sequencing for the presence of different genotypes of HPV in northern province of Iran, Mazandaran.

2. Materials and methods

2.1. Tissue samples

A total of 233 blocks of paraffin-embedded tissue including 144 samples diagnosed as lung carcinomas and 92 non-cancer samples as control were retrieved from archive of Imam Khomeini Hospital, Medicine faculty of Sari city, Mazandaran University of Medical Sciences, Iran between 1998 and 2004. The non-cancer patients with different lung diseases, including pneumothorax, cryptococcal and Hydatic cyst infection and fibrosis served as control subjects.

2.2. Nested PCR

Genomic DNA was prepared from a tissue section and isolated by conventional phenol–chloroform extraction and ethanol precipitation and was finally dissolved in 80 μl of sterile distilled water. To avoid contamination during extraction of the DNA, great care was taken. The blocks were sectioned to several small groups at different time over a period of one week. New surgical blade was used for each sample. In addition to monitor the contamination, a few negative controls (water samples) were used in each round of extraction. Also the filter tips were used both during extraction and PCR procedures.

To exclude false-negative results, the adequacy of the DNA in each specimen for PCR amplification was determined by detection of a 110- or 268-base pair fragment of the β-globin gene after amplification using the PC03/PC04 and GH20/PC04 primer set, respectively [12].

For detection of HPV genome, nested PCR were performed using MY09-MY11 as outer and GP5+-GP6+ as inner primers [13]. In the first round PCR with primers MY09-MY11 was performed in a final volume of 50 μl. Each PCR mixture contained 50 mM KCl, 10 mM Tris–HCl (pH 8.5), 4 mM $MgCl_2$, a 200 μM concentration of each dNTP, 2 U of FastStart DNA Polymerase (Roche, Germany) and 1 μM of primers MY09 and MY11. Amplification were performed with the following cycling profile: FastStart DNA

Download English Version:

https://daneshyari.com/en/article/2115472

Download Persian Version:

https://daneshyari.com/article/2115472

Daneshyari.com