Increased serum carcinoembryonic antigen level can predict poor survival of patients with small cell lung cancer

HUI ZHU, HONGBO GUO, MINGHUAN LI, YAN ZHANG, ANQIN HAN, FANG SHI, LI KONG, and JINMING YU

JINAN, SHANDONG PROVINCE, CHINA

Increased serum tumor biomarkers are usually associated with huge tumor burden, but the prognostic value of these markers remains controversial. The serum levels of carcinoembryonic antigen (CEA), nerve cell–specific enolase, and lactate dehydrogenase in 281 patients with small cell lung cancer (SCLC) were analyzed in this study. Increased serum CEA levels were observed in 92 (32.7%) patients. Survival was superior in patients with normal serum CEA levels compared with those with increased serum CEA levels. The median survival time, 2-year overall survival (OS) rate, and 3-year OS rate were 19.1 months vs 14.6 months, 42.7% vs 28.3%, and 30.6% vs 14.1%, respectively ($P = 0.002$). In multivariate analysis, extensive-stage (ES)-SCLC (hazard ratio (HR) = 1.936, $P = 0.001$), an increased serum CEA level (HR = 1.432, $P = 0.021$) at diagnosis, and <4 cycles of chemotherapy (ChT) (HR = 0.432, $P = 0.001$) were independent negative prognostic factors for the OS. Additionally, normal CEA level (HR = 1.678, $P = 0.012$), treatment modalities including surgery (HR = 1.595, $P = 0.049$), and ≥ 4 cycles of ChT (HR = 1.880, $P = 0.004$) were independent positive prognostic factors for OS in patients with local disease. In the subgroup with ES-SCLC, normal serum CEA level (HR = 1.608, $P = 0.043$), thoracic radiation therapy (HR = 1.744, $P = 0.005$), and ≥ 4 cycles of ChT (HR = 2.626, $P = 0.001$) were independent positive prognostic factors for OS. (Translational Research 2015;166:355–365)

Abbreviations: CEA = carcinoembryonic antigen; ChT = chemotherapy; ES = extensive stage; HR = hazard ratio; KPS = Karnofsky performance status; LDH = lactate dehydrogenase; LS = limited stage; MST = median survival time; NSE = neuron-specific enolase; OS = overall survival; SCLC = small cell lung cancer; TRT = thoracic radiation therapy; 2-y OS = overall survival rate at 2 year; 3-y OS = overall survival rate at 3 year

INTRODUCTION

Small cell lung cancer (SCLC) accounts for approximately 15%–20% of all types of lung cancer.[1,2] The clinical and biological behaviors of SCLC are different from those of non-SCLC. SCLC is characterized by a high incidence of metastatic disease at presentation, rapid doubling time, and a high response rate to treatment.[3] SCLC is highly sensitive to both chemotherapy (ChT) and radiation therapy; chemoradiotherapy followed by prophylactic cranial

From the Department of Radiation Oncology, Shandong Cancer Hospital and Institute, Jinan, Shandong Province, China; Department of Thoracic Surgery, Shandong Cancer Hospital and Institute, Jinan, Shandong Province, China; Department of Medical Oncology, Shandong Cancer Hospital and Institute, Jinan, Shandong Province, China.

Submitted for publication December 11, 2014; revision submitted April 8, 2015; accepted for publication April 8, 2015.

Reprint requests: Jinming Yu and Li Kong, Department of Radiation Oncology, Shandong Cancer Hospital and Institute, Jiyan Road 440, Jinan 250117, Shandong Province, China; e-mail: kongli7@sina.com or sdyujinming@126.com.

1931-5244/$ - see front matter

© 2015 Elsevier Inc. All rights reserved.

http://dx.doi.org/10.1016/j.trsl.2015.04.005

AT A GLANCE COMMENTARY

Zhu H, et al.

Background

With regard to biological factors, serum levels of neuron-specific enolase and carcinoembryonic antigen (CEA) may be related to tumor burden, but the prognostic value of these markers remains controversial.

Translational Significance

Our retrospective analysis demonstrated that increased serum level of CEA at diagnosis was an independent negative prognostic factor for the survival of patients with small cell lung cancer. The result gave evidence of the individualized therapy such as maintaining chemotherapy, which may be necessary for the patients with increased CEA, and further study on this subgroup is necessary.

irradiation (PCI) could improve survival. However, the overall survival (OS) status is still poor with a 5-year survival rate of approximately 20% for limited-stage (LS) SCLC and only 1.0%–9.1% for extensive stage (ES).[4-8]

The prognosis of patients with SCLC varies widely. Disease stage at the diagnosis is an important factor affecting the prognosis, and this finding has been confirmed by many follow-up studies. There is also good consensus from a larger series of researches that Karnofsky performance status (KPS) and lactate dehydrogenase (LDH) are consistently effective prognostic factors. Nevertheless, other clinical factors, including age, gender, and weight loss at the diagnosis are not strongly linked to long-term survival in patients with SCLC. With regard to biological factors, serum levels of neuron-specific enolase (NSE) and carcinoembryonic antigen (CEA) may be related to tumor burden and therapy response, but the prognostic value of these markers remains controversial.[9-15] Given the inconsistency between findings of different studies and the obscure prognostic value in predicting survival in SCLC, the aim of this retrospective study was to investigate the prognostic importance of biological markers such as the serum CEA and NSE level and their clinical utility to guide therapeutic strategies and improve outcomes for patients with SCLC.

PATIENTS AND METHODS

Patients. Patients diagnosed with SCLC on the basis of cytologic or histologic proof at Shandong Cancer Hospital between January 2004 and December 2009 were retrospectively reviewed. The clinical data were drawn from their inpatient records. All patients had undergone standardized evaluation, including thoracic and abdominal computed tomography scanning or abdominal ultrasonography, brain magnetic resonance imaging, and bone radionuclide imaging, and the disease stage was reached according to the system of the Veterans' Administration Lung Study Group.[16] Patients who were not treated with standard therapy including sequential chemoradiotherapy, concurrent chemoradiotherapy, or complete surgery followed by ChT or chemoradiotherapy for LS disease, and ChT with or without thoracic radiation therapy (TRT) for ES disease were excluded from the study. Detailed data on the serum levels of biological markers including NSE, CEA, LDH, and other clinical factors, including gender, age, weight loss, smoking status, and KPS score of enrolled patients were also recorded. Additionally, the patients without standard therapy were analyzed separately to evaluate the prognostic role of CEA in this subgroup.

This article conformed to the relevant ethical guidelines for human research. This investigation was approved by the institutional review board or ethics committee at the Shandong Cancer Hospital, and all study participants provided a written informed consent.

NSE, CEA, and LDH assays. Serum samples were obtained by venous puncture at the time of diagnosis. The tumor markers NSE and CEA were measured by commercial electrochemiluminescence immunoassay using Elecsys cobas e601 analyzer and reagent kits (Roche Diagnostics, Mannheim, Germany). The LDH activity was measured by a kinetic spectrophotometric method in a Roche Modular P800 biochemical analyzer (Roche Diagnostics). The cutoff values were defined according to the corresponding manufacturers' recommendations: 5 ng/mL for CEA, 18 ng/mL for NSE, and 214 U/L for LDH.

Measurement of response and endpoints. Unidire ctional measurements were obtained according to the Response Evaluation Criteria in Solid Tumors as follows: a complete response (CR) was defined as the disappearance of all target lesions, a partial response (PR) was defined as a decrease of 30% in the sum of the greatest dimensions of target lesions using the sum at baseline as the reference, progressive disease was defined as an increase of 20% in the sum of the greatest dimensions of target lesions using the smallest sum or the appearance of 1 or more new lesions as the reference, and stable disease was defined as neither sufficient shrinkage to qualify as a PR nor a sufficient increase to qualify for as progressive disease.

Download English Version:

https://daneshyari.com/en/article/3840062

Download Persian Version:

https://daneshyari.com/article/3840062

Daneshyari.com