



ORIGINAL ARTICLE

## Is $^{18}\text{F}$ -FDG-PET/CT prognostic factor for survival in patients with small cell lung cancer? Single center experience

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### KEYWORDS

Small cell lung cancer;  
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### Abstract

**Background:** Although a number of studies in patients with a variety of malignant tumors have shown that metabolic activity on fluorine-18 deoxyglucose positron emission tomography computed tomography ( $^{18}\text{F}$ -FDG-PET/CT) is correlated with survival, there are few studies about the impact of  $^{18}\text{F}$ -FDG-PET/CT for survival in small cell lung cancer (SCLC) patients. There is still some ambiguity as to whether FDG PET in patients with SCLC will ensure prognostic knowledge for survival. We performed a retrospective analysis of prognostic implication of  $^{18}\text{F}$ -FDG-PET/CT in patients with SCLC.

**Methods:** We retrospectively reviewed 54 patients with histologically or cytologically proven SCLC who had undergone pre-treatment  $^{18}\text{F}$ -FDG-PET/CT scanning between September 2007 and November 2011 in the Dicle University, School of Medicine, Department of Medical Oncology. SUVmax and other potential prognostic variables were chosen for analysis in this study. Univariate and multivariate analyses were conducted to identify prognostic factors associated with survival.

**Result:** Among the eleven variables of univariate analysis, three variables were identified as having prognostic significance: Performance status ( $p < 0.001$ ), stage ( $p = 0.02$ ) and diabetes mellitus ( $p = 0.05$ ).

Multivariate analysis showed that performance status and stage were considered independent prognostic factors for survival ( $p < 0.001$  and  $p = 0.002$  respectively).

**Conclusion:** In conclusion, performance status and stage were identified as important prognostic factors, while  $^{18}\text{F}$ -FDG-PET/CT uptake of the primary lesions was not associated with prognostic importance for survival in patients with SCLC.

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**PALAVRAS-CHAVE**

Cancro pulmonar de pequenas células; Fatores de prognóstico;  $^{18}\text{F}$ -FDG-PET/CT

## É o $^{18}\text{F}$ -FDG-PET/CT um fator de prognóstico para a sobrevivência em pacientes com cancro pulmonar de pequenas células? Experiência num único centro

**Resumo**

**Antecedentes:** Embora uma série de estudos em pacientes com uma diversidade de tumores malignos tenham demonstrado que a atividade metabólica na tomografia computadorizada por emissão de positrões de deoxiglucose marcada com flúor-18 ( $^{18}\text{F}$ -FDG-PET/CT) está correlacionada com a sobrevivência, existem poucos estudos sobre o impacto do  $^{18}\text{F}$ -FDG-PET/CT para a sobrevivência em pacientes com cancro pulmonar de células pequenas (SCLC). Ainda existe alguma ambiguidade de que, em pacientes com SCLC, o FDG PET forneça informações importantes relativamente de prognóstico para a sobrevivência. Realizámos uma análise retrospectiva da implicação no prognóstico de  $^{18}\text{F}$ -FDG-PET/CT em pacientes com SCLC.

**Métodos:** Analisámos retrospectivamente 54 pacientes com SCLC comprovado histologicamente ou citologicamente, que tinham realizado  $^{18}\text{F}$ -FDG-PET/CT entre setembro de 2007 e novembro de 2011, na Universidade de Dicle, Faculdade de Medicina, Departamento de Oncologia Médica. Foram escolhidas a SUVmax e outras potenciais variáveis de prognóstico para a análise neste estudo. Foram realizadas análises univariadas e multivariadas para identificar os fatores de prognóstico associados à sobrevivência.

**Resultado:** Entre as 11 variáveis da análise univariada, 3 variáveis foram identificadas como tendo significância para o prognóstico. Estado Geral ( $p < 0,001$ ), estágio ( $p = 0,02$ ) e diabetes mellitus ( $p = 0,05$ ).

A análise multivariada mostrou que o Estado Geral e o estágio foram considerados fatores de prognóstico independentes para a sobrevivência ( $p < 0,001$ ,  $p = 0,002$  respetivamente).

**Conclusão:** Em conclusão, o Estado Geral e o estágio foram identificados como importantes fatores de prognóstico, enquanto a absorção de  $^{18}\text{F}$ -FDG-PET/CT das lesões primárias não se associou ao prognóstico para a sobrevivência em pacientes com SCLC.

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**Introduction**

Lung cancer is the most common among cancer-related deaths in both men and women in worldwide. Small cell lung cancer (SCLC) represents approximately 15% of all diagnosed lung cancers cases.<sup>1,2</sup> SCLC is associated with a more rapid tumor doubling time, a high growth fraction and early widespread dissemination. As a result of this, overall survival (OS) rates for these patients are disappointingly low.

The Veterans Administration Lung Study Group two-tiered staging system was used to classify SCLC as either limited disease (LD) or extended disease (ED) which was primarily based on compatibility for treatment options.<sup>3</sup> Despite its practical usefulness and prognostic advantage, this staging system is not accurate enough to reflect tumor burden, and it is insufficient to predict survival in some patients.

Very different prognostic factors in several trials have been identified for survival in patients with SCLC<sup>4-7</sup>; however, none of these prognostic factors are sufficiently reliable to base treatment decision on. Even though fluorine-18 deoxyglucose positron emission tomography computed tomography ( $^{18}\text{F}$ -FDG-PET/CT) scan is widely utilized in staging SCLC, it is not standard work-up for SCLC with respect to international guidelines. Owing to the fact that a number of studies in patients with a variety of malignant tumours<sup>8-13</sup> have shown that metabolic activity on  $^{18}\text{F}$ -FDG-PET/CT is correlated with survival, there are few studies about the impact of  $^{18}\text{F}$ -FDG-PET/CT for survival

in SCLC patients.<sup>14-17</sup> There remains an ambiguity as to whether  $^{18}\text{F}$ -FDG-PET/CT in patients receiving first-line etoposide plus cisplatin (EP) chemotherapy will provide reliable prognostic knowledge about survival.

We performed a retrospective analysis of the prognostic implication of  $^{18}\text{F}$ -FDG-PET/CT for patients with SCLC. The aim of this study was to investigate the prognostic significance of the characteristics of patients in SCLC. Specifically, we investigated the prognostic implication of  $^{18}\text{F}$ -FDG-PET/CT for OS in the patients receiving first-line EP chemotherapy.

**Methods****Patient population**

We retrospectively reviewed 54 patients with histologically or cytologically proven SCLC who had undergone pre-treatment  $^{18}\text{F}$ -FDG-PET/CT scanning from September 2007 to November 2011 in the Dicle University, School of Medicine, Department of Medical Oncology. They met the following inclusion criteria; (1) 18 or more years old; (2) a histologic or cytologic diagnosis of SCLC; (3) no previous chemotherapy or radiotherapy; (4) there was sufficient clinical data recorded in medical records; (5) they had to have a measurable disease, as defined by Response Evaluation Criteria in Solid Tumours (RECIST).

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