中文題目：病前體重質量指數(BMI)作為肺小細胞癌的預後因子

英文題目：Premorbid BMI as a prognostic factor in small-cell lung cancer – a single institute experience

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Background: Numerous evidence has indicated that excess weight is associated with an increased risk of mortality in patients in breast, colorectal, pancreatic, endometrial, and prostate cancer. However, with respect to non-small cell lung cancer and upper aero-digestive cancer, evidence suggests that the results are opposite, but a definitive link between premorbid BMI and overall survival (OS) in small cell lung cancer (SCLC) patients has yet to be fully explored.

Methods: A total of 260 patients who had histologically-confirmed SCLC from January 2000 to March 2012, and treated at the Tri-Service General Hospital/National Defense Medical Center (TSGH/NDMC) were evaluated for eligibility. Continuous variables were described using mean ± SD and the categorical variables were analyzed by a Chi-squared test. The Kaplan-Meier method and log-rank tests were employed to compare the survival curves. Multivariate analyses were conducted to identify significant independent prognostic factors for the prognosis. Hazard ratio (HR) for each factor was calculated using a Cox-regression proportional hazards model, and median OS was calculated using Kaplan-Meier analysis.

Results: A total of 173 eligible patients were enrolled for the evaluation. Multivariate Cox analysis indicated that pretreatment overweight (BMI > 23) was an independent prognostic factor for OS (Hazard ratio = 0.58, 95% CI = 0.39–0.87, p = 0.008). In addition, meta-regression revealed that performance status (<□ 2) marginally interacted with increased BMI (p = 0.068). Subgroup analysis showed that patients with a BMI > 23 and performance status ≤ 2 had the best OS (Hazard ratio = 0.31, 95% CI: 0.16–0.61, p = 0.001).

Discussion: Consistent with studies of NSCLC patients, we found that OS and PFS were higher in SCLC patients whose BMI was > 23 compared to those whose BMI was < 23 (OS: 620.0 vs. 311.7 days, p < 0.001; PFS: 421.3 vs. 200.9 days, p = 0.001, **Figure 1 a and b**). In contrast, there was no statistically significant relationship between the BMI and age, gender, stage, CCS, WBC, NLR, albumin, PLT, and ALP. Multivariate Cox analysis indicated that

being overweight prior to treatment was an independent prognostic factor for long-term outcome (HR = 0.58, 95% CI = 0.39-0.87, p= 0.008) (**Table**).

These data indicate that pending future validation, increased BMI has the potential to be an easily measurable prognostic indicator. A marginal interaction between PS and BMI was also noted (p = 0.068). Patients with PS ≤2 and overweight (BMI > 23) had the longest OS (p < 0.05, **Figure 2**). This result needs to be validated due to the small sample size available for our study. In conclusion, being overweight prior to diagnosis is associated with improved survival of patients with SCLC based on our single institute experience. Pretreatment BMI and PS can be more easily measured than clinical cancer stage, serum biomarker, gene mutation, suggesting that BMI may provide an additional simple and convenient prognostic factor for OS in SCLC patients. Furthermore, this may help inform decision making in the clinic. Finally, the maintenance of adequate body weight is likely to increase a lung cancer patient's life-span.

Figure 1a

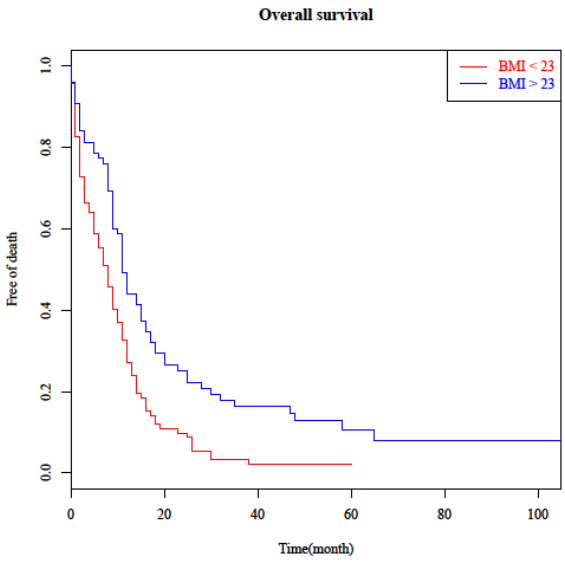

Figure 1b

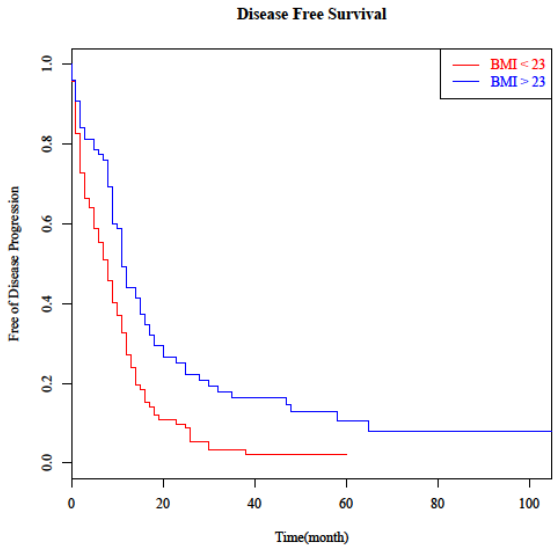

Figure 2

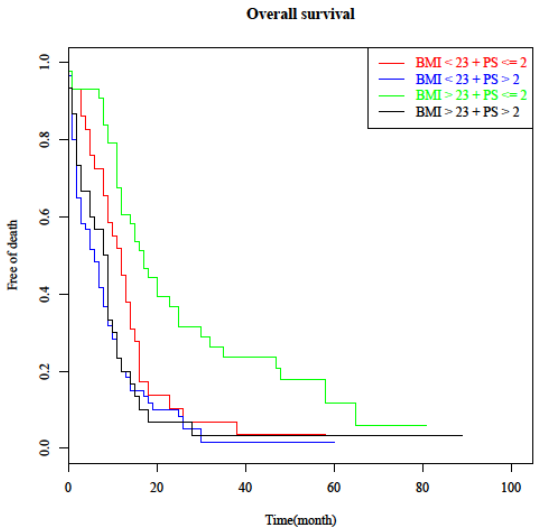

Table. multivariate factors

	Model 1		Model 2		Model 3	
Independent variable	**HR (95% CI)**	**p-value**	**HR (95% CI)**	**p-value**	**HR (95% CI)**	**p-value**
Stage : 4	1.40 (1.00 - 1.95)	0.049	1.36 (0.79 - 2.35)	0.266	1.28 (0.65 - 2.52)	0.477
Age > 70 years			1.50 (0.96 - 2.33)	0.075	2.73 (1.52 - 4.91)	0.001
Female					0.58 (0.32 - 1.07)	0.080
IBWD >10%	0.53 (0.38 - 0.75)	<0.001	0.62 (0.41 - 0.94)	0.025	0.64 (0.42 - 0.98)	0.038
BMI > 23	0.56 (0.40 - 0.77)	<0.001	0.73 (0.48 - 1.11)	0.139	0.58 (0.39 - 0.87)	0.008
Metastases > 2 organs					1.35 (0.66 - 2.76)	0.417
Charlson Comorbidity Index < 8	0.97 (0.72 - 1.30)	0.850	0.64 (0.41 - 1.01)	0.055	0.46 (0.25 - 0.85)	0.014
WBC>11000(UL)			2.52 (0.86 - 7.41)	0.093	4.95 (1.41 - 17.36)	0.012

	Model 1		Model 2		Model 3	
Independent variable	**HR (95% CI)**	**p-value**	**HR (95% CI)**	**p-value**	**HR (95% CI)**	**p-value**
Respiratory Chief Complaint					1.90 (0.99 - 3.63)	0.053
ECOG PS > 2	2.06 (1.51 - 2.83)	<0.001	1.99 (1.28 - 3.11)	0.002	1.97 (1.17 - 3.31)	0.011
NLR > 3.04			1.01 (0.67 - 1.55)	0.945	0.97 (0.60 - 1.57)	0.912
Albumin < 3.5 (g/dL)	1.42 (1.05 - 1.93)	0.024	0.81 (0.51 - 1.28)	0.366	0.81 (0.49 - 1.36)	0.431
PLT <150 or >450 (10^3/uL)	1.14 (0.76 - 1.70)	0.532	1.28 (0.73 - 2.24)	0.396	1.95 (0.89 - 4.26)	0.093
Complication					1.75 (0.93 - 3.29)	0.081
ALP > 104 (U/L)	1.90 (1.30 - 2.76)	0.001	1.35 (0.81 - 2.25)	0.253	1.06 (0.58 - 1.96)	0.841
Smoking > 0.5 (PPD/Day)					2.37 (1.15 - 4.86)	0.019