78P Association between obesity, sex, and overall survival in patients with metastatic cancers treated with first- or second-line immune checkpoint inhibitors

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Introduction

- Obesity exerts a wide arrange of physiological effects on health[1].
- Obesity influences oncogenesis, and impact on cancer outcomes is not completely understood[1,2].
- Adipose tissue is known to play a critical role in androgen and estrogen metabolism[3], and recent evidence established a link between male sex and T-cell exhaustion, both of which may affect the responsiveness of the immune system to immunotherapy[4,5].
- We studied the association between obesity, sex, and overall survival (OS) in cancer patients who were treated with a checkpoint inhibitor-based regimen.

Methods

- We retrospectively studied 688 pts with metastatic cancers treated with first or second-line ICI between 2011-2017 at Ohio State University.
- Pre-treatment BMI was collected. Cox proportional hazards models were used to assess the association between variables.
- Effect modification by sex was assessed using an interaction term. Analyses were performed in SAS 9.4.

Demographics

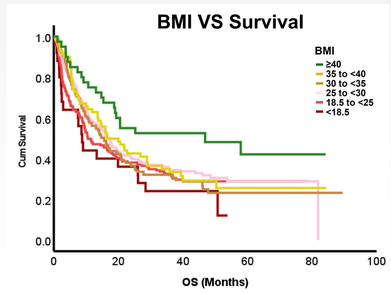
Table 1. Patient Demographics of all 688 patients

Race			**Line of Therapy**			**BMI**	
White	649	94%	First	360	52%	Mean	28.8
Black	31	5%	Second	328	48%	Median	28.0
Other	8	1%				Std Deviation	7.1
Sex			**Age**			**BMI**	
Female	285	41%	Mean	61.9	years	<18.5	25 4%
Male	403	59%	Median	62.0	years	18.5 to <25	189 27%
Cancer Type			**ECOG**			25 to <30	224 33%
Melanoma	277	40%	0	286	42%	30 to <35	140 20%
NSCLC	157	23%	1	283	41%	35 to <40	70 10%
Renal Cell	67	10%	≥2	102	15%	≥40	40 6%
Other	187	27%	Unknown	12	2%		

Results

Higher BMI is associated with longer overall survival

Figure 1. Kaplan-Meier survival analysis for BMI groups

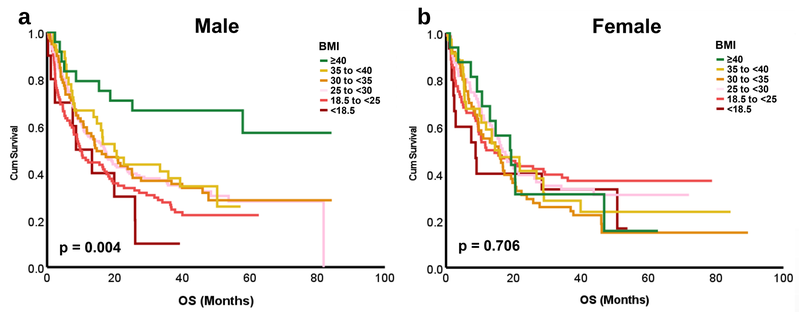


In univariate analysis, for each unit increase in BMI, the hazard of death decreased by 1.8% (HR=0.982 with 95% CI 0.969-0.995 and p=0.007).

For illustration purpose, we grouped patients in conventional BMI intervals. Patients with BMI ≥40 had the lowest risk of death among all the other groups (Figure 1).

In subgroup analysis, high BMI in male patients is associated with longer survival. A reversed non-significant trend was seen in female patients.

Figure 2. Overall survival by KM plot for a). Male patients b). Female patients



HR = 0.964 (95% CI 0.964-0.982) for every 1 unit increase in BMI

HR = 1.003 (95% CI 9.985-1.022) for every 1 unit increase in BMI

In Multivariate analysis, BMI remain a significant prognostic factor for survival in male patients after adjusting for ECOG, line of therapy, and cancer types.

Table 2. HR of BMI as a continuous variable after adjusting for ECOG, Line of therapy, Cancer type,

Sex	HR	95% CI		p value
Female	0.9915	0.9733	1.0100	0.3653
Male	0.979	0.96	0.998	0.0308

Results

In a separate cohort, high BMI was associated with longer OS in NSCLC [5]

Figure 3. KM plot of normal vs BMI ≥ 40 in a separate NSCLC cohort.

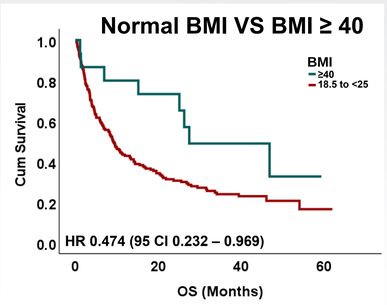


Table 3. Demographics data of patients with normal BMI VS ≥40

	Normal	BMI ≥40
Patient Count	185	15
Median OS	9.1 mos.	27.5 mos.
Median Age	63.5	60
ECOG		
0	32 (17%)	1 (7%)
1	98 (53%)	11 (73%)
≥2	54 (29%)	2 (13%)
Unknown	1 (1%)	1 (7%)
Line of Therapy		
1	109 (59%)	9 (60%)
2	54 (29%)	4 (27%)
≥3	20 (11%)	2 (13%)
Unknown	2 (1%)	0 (0%)

Conclusion

High BMI in male, but not female, was associated with improved overall survival in pts with metastatic cancer treated with ICIs.

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