172 BODY MASS INDEX (BMI) AND SERUM ALBUMIN LEVEL AS A PREDICTOR OF SURVIVAL OUTCOMES IN ADVANCED-STAGE MELANOMA PATIENTS TREATED WITH ANTI-PD1 THERAPY

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Background Body mass index (BMI) and serum albumin are common measurements used to evaluate nutritional status. Recent studies have shown conflicting results correlating nutritional status with immune checkpoint inhibitor (ICI) therapy outcomes.[1,2] In this study, we investigate if baseline and change in BMI and serum albumin levels correlate with survival outcomes in advanced stage melanoma patients treated with anti-PD-1 therapy.

Methods We conducted a single-center, retrospective review of unresectable stage III and IV melanoma patients treated with anti-PD-1 monotherapy (nivolumab or pembrolizumab) or ipilimumab/nivolumab (I/N) between 2011 and 2022. Overall survival (OS) and progression-free survival (PFS) were measured from the first dose of treatment to date of death and clinical or radiographic progression, respectively. The effect of baseline BMI, serum albumin levels, and their respective percentage change at 3 months from treatment initiation on PFS and OS was assessed on a continuum level. Multivariate analyses were performed using Cox proportional hazard models, accounting for the following covariates: Age, gender, anti-PD-1 therapy type, primary melanoma type, pre-treatment LDH, BRAF status, presence of brain or liver metastasis, and prior adjuvant or non-anti-PD-1 treatment for advanced-stage melanoma.

Results 202 patients were identified. Mean BMI was 30.1 and mean albumin level was 3.63 g/dL. Higher baseline BMI (HR 0.9825, 95% CI: 0.9657–0.9996, p=0.0445) and lower baseline albumin level (HR 2.4498, 95% CI: 1.2606–4.7619, p=0.0082) was associated with worse PFS [table 1]. Change in BMI and albumin level at 3 months was not associated with PFS outcomes. Lower baseline albumin level was associated with worse OS outcomes [HR 2.4814, 95% CI: 1.1161–5.5157 p=0.0258]. Higher change in albumin level at 3 months was also associated with worse OS [HR 0.9389, 95% CI: 0.9109–0.9677, p=0.00004]. Our univariate analysis showed lower baseline albumin level and decreasing albumin change from the baseline mean at 3 months was associated with worse PFS and OS [figure 1].

Conclusions Nutritional status may have a predictive role on survival in advanced melanoma patients treated with anti-PD-1 therapy. Baseline albumin and decreasing albumin levels at 3 months is associated with worse survival. Unlike previous studies, we found that higher baseline BMI may lead to worse PFS outcomes in immunotherapy treated patients. Interventional studies are warranted to see if nutritional status optimization prior to and during anti-PD-1 therapy can affect clinical outcomes.

REFERENCES

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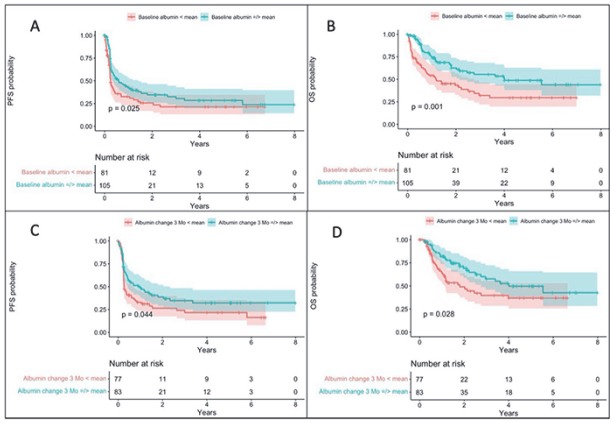
Ethics Approval The study was approved by the University of Wisconsin institutional ethical guidelines and patients' consents were waived following Institutional Review Board protocol review (UW21110).

Abstract 172 Table 1

Variables	Progression Free Survival		Overall Survival	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Anti-PD-1 Treatment Type (I/N vs Anti-PD-1 Monotherapy)	0.6031 (0.3142, 1.1580)	0.1287	0.705 (0.416–1.194)	0.0002*
Prior Non-Anti-PD-1 Treatment for Advanced Melanoma (yes vs no)	2.1245 (1.1989, 3.7649)	0.0098	2.006 (1.181–3.409)	0.0744
Prior Adjuvant Treatment (yes vs no)	1.8887 (1.0764–3.3140)	0.0267*	1.3445 (0.6913–2.6149)	0.3831
Age (<65 vs ≥65)	0.8766 (0.5503–1.3964)	0.5794	1.0933 (0.6140–1.9469)	0.7618
Gender (male vs female)	0.9264 (0.5896–1.4557)	0.7403	1.2059 (0.6620–2.1968)	0.5406
BRAF status (mutant vs WT)	1.0336 (0.6555–1.6299)	0.8868	0.5731 (0.3203–1.0254)	0.0608
Primary melanoma type (Cutaneous vs Mucosal or Unknown)	0.8050 (0.4775–1.3569)	0.4155	0.7097 (0.3608–1.3958)	0.3204
Pre-treatment LDH level‡ (>ULN vs normal)	1.5201 (0.9678–2.3876)	0.0691	2.6213 (1.4604–4.7050)	0.0012*
Brain metastases (yes vs no)	0.9747 (0.5474–1.7357)	0.9307	1.2712 (0.6361–2.5402)	0.4969
Liver metastases (yes vs no)	1.3610 (0.8354–2.2174)	0.2158	1.3743 (0.7534–2.5067)	0.2999
Baseline BMI (lower vs higher)	0.9825 (0.9657–0.9996)	0.0445*	0.9617 (0.9154–1.0103)	0.1209
Baseline albumin level (lower vs higher)	2.4498 (1.2606–4.7619)	0.0082*	2.4814 (1.1161–5.5157)	0.0258*
Percent change in BMI at 3 months from baseline (lower vs higher)	1.0205 (0.9697–1.0739)	0.4363	0.9896 (0.9277–1.0557)	0.7518
Percent change in albumin level at 3 months from baseline (lower vs higher)	0.9814 (0.9579–1.0054)	0.1274	0.9389 (0.9109–0.9677)	4.31×10^{-5}*

Multivariate Cox proportional hazard regression models for progression-free survival and overall survival.
*Indicates statistical significance of p<0.05. ‡Normal limits of LDH <240 U/L.
Abbreviations: CI, confidence interval; HR, hazard ratio; I/N, ipilimumab/nivolumab; LDH, lactate dehydrogenase; BMI, body mass index; OS, overall survival; PFS, progression-free survival; ULN, upper limit of normal; WT, wildtype.



Abstract 172 Figure 1 Kaplan-Meier curves of progression-free survival (PFS) and overall survival (OS) comparing patients based on baseline albumin levels and percent albumin change at 3 months. Mean albumin level was 3.63 g/dL. A) PFS difference between patients with baseline albumin below the mean and those with baseline albumin above the mean. B) OS difference between patients with baseline albumin below the mean and those with baseline albumin above the mean. C) PFS difference between patients with percent albumin change 3 months below the mean and those with percent albumin change 3 months above the mean. D) OS difference between patients with percent albumin change 3 months below the mean and those with percent albumin change 3 months above the mean

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