

SUPPLEMENT

Subgroup Analysis

Subgroup analysis was performed based on clinicopathological factors, including menstrual status, T and N stages, histologic grade, estrogen receptor (ER), human epidermal growth factor receptor 2 (HER2), and Ki-67, to evaluate the association of baseline, time-varying, and delta value of skeletal muscle index (SMI) and visceral adipose tissue area (VAT) with disease-free survival (DFS).

The results of subgroup analysis are shown in Supplementary Table 1. The baseline VAT was significantly associated with DFS (hazard ratio [HR], 1.019; 95% confidence interval [CI], 1.003–1.034; $p = 0.017$) in the histologic grade 1 subgroup. Time-varying SMI and VAT were also associated with DFS in this subgroup (HR, 0.861; 95% CI: 0.774–0.959; $p = 0.007$ and HR, 1.018; 95% CI, 1.002–1.034; $p = 0.032$, respectively). The positive delta VAT was significantly associated with worse DFS in the HER2-positive subgroup (HR, 1.053; 95% CI, 1.011–1.096; $p = 0.013$). The time-varying VAT was significantly associated with DFS in the low Ki-67 subgroup (HR, 0.982; 95% CI, 0.968–0.996; $p = 0.012$). Other subgroup analyses showed no significant association between body composition parameters and recurrence.

Supplementary Table 1. Subgroup Analysis of SMI and VAT associated with Disease-Free Survival

Subgroup Variable		Predictor	Type	n	HR	95% CI		P
Histologic grade	1	SMI	Baseline*	212	0.835	0.680	1.026	0.086
			Time-varying*	212	0.861	0.774	0.959	0.007
			Delta [†]	212	0.679	0.362	1.271	0.226
		VAT	Baseline*	212	1.019	1.003	1.034	0.017
			Time-varying*	212	1.018	1.002	1.034	0.032
			Delta [†]	212	0.996	0.969	1.024	0.778
	2	SMI	Baseline	263	0.955	0.880	1.037	0.273
			Time-varying	263	0.971	0.901	1.045	0.428
			Delta	255	0.920	0.744	1.137	0.441
		VAT	Baseline	263	0.997	0.987	1.008	0.580
			Time-varying	263	1.000	0.992	1.007	0.964
			Delta	255	1.005	0.985	1.025	0.653
3	SMI	Baseline	152	1.009	0.919	1.108	0.843	
		Time-varying	152	1.022	0.949	1.099	0.569	
		Delta	145	0.906	0.713	1.152	0.421	
	VAT	Baseline	152	1.000	0.990	1.011	0.972	
		Time-varying	152	1.001	0.992	1.011	0.782	
		Delta	145	1.000	0.980	1.020	0.986	
HER2	Negative	SMI	Baseline	493	0.949	0.887	1.016	0.132
			Time-varying	493	0.972	0.921	1.026	0.308
			Delta	481	0.883	0.739	1.056	0.174
		VAT	Baseline	493	0.998	0.991	1.006	0.697
			Time-varying	493	1.000	0.994	1.007	0.938
			Delta	481	0.996	0.980	1.012	0.630
	Positive	SMI	Baseline	134	1.166	1.001	1.358	0.048
			Time-varying	134	1.104	0.988	1.233	0.081
			Delta	131	1.237	0.848	1.804	0.269
		VAT	Baseline	134	1.026	1.000	1.052	0.051
			Time-varying	134	1.011	0.997	1.025	0.110
			Delta	131	1.053	1.011	1.096	0.013
Ki-67	< 20%	SMI	Baseline	283	0.876	0.715	1.072	0.198
			Time-varying	283	0.895	0.771	1.037	0.140
			Delta	279	0.811	0.493	1.334	0.409
		VAT	Baseline	283	0.989	0.968	1.011	0.335
			Time-varying	283	0.982	0.968	0.996	0.012
			Delta	279	1.005	0.971	1.040	0.778
	≥ 20%	SMI	Baseline	344	0.976	0.919	1.036	0.428
			Time-varying	344	0.989	0.940	1.041	0.677
			Delta	333	0.913	0.766	1.087	0.305
		VAT	Baseline	344	1.001	0.994	1.008	0.853
			Time-varying	344	1.003	0.996	1.009	0.371
			Delta	333	1.001	0.987	1.014	0.931
Menstrual status	Postmenopause	SMI	Baseline*	372	0.969	0.900	1.043	0.396
			Time-varying*	372	0.990	0.936	1.047	0.713
			Delta [†]	361	0.830	0.676	1.018	0.074
		VAT	Baseline*	372	1.000	0.992	1.008	0.963
			Time-varying*	372	1.001	0.994	1.008	0.766
			Delta [†]	361	0.999	0.983	1.016	0.921
	Premenopause	SMI	Baseline	255	0.959	0.865	1.063	0.425
			Time-varying	255	0.974	0.887	1.070	0.582
			Delta	251	1.014	0.779	1.319	0.919
		VAT	Baseline	255	0.997	0.981	1.013	0.697
			Time-varying	255	1.001	0.988	1.014	0.896
			Delta	251	1.011	0.988	1.034	0.349
T stage	1	SMI	Baseline	405	0.955	0.865	1.054	0.360
			Time-varying	405	0.979	0.908	1.054	0.569
			Delta	397	1.012	0.803	1.275	0.921
		VAT	Baseline	405	0.999	0.987	1.010	0.825
			Time-varying	405	1.002	0.995	1.009	0.587
			Delta	397	1.012	0.993	1.032	0.214
	2 or 3	SMI	Baseline	222	0.965	0.895	1.041	0.357
			Time-varying	222	0.991	0.927	1.060	0.801
			Delta	215	0.801	0.643	0.999	0.049
		VAT	Baseline	222	0.998	0.990	1.007	0.695
			Time-varying	222	0.998	0.991	1.006	0.678
			Delta	215	0.994	0.977	1.011	0.493
N stage	0	SMI	Baseline	400	0.988	0.911	1.071	0.772
			Time-varying	400	1.001	0.941	1.064	0.981
			Delta	394	0.885	0.696	1.126	0.321
		VAT	Baseline	400	1.003	0.993	1.012	0.570
			Time-varying	400	1.003	0.995	1.011	0.434
			Delta	394	1.005	0.989	1.022	0.543
	1	SMI	Baseline	163	0.934	0.834	1.047	0.243
			Time-varying	163	0.954	0.855	1.064	0.398
			Delta	162	1.003	0.771	1.307	0.979
		VAT	Baseline	163	0.996	0.983	1.008	0.483
			Time-varying	163	0.996	0.984	1.009	0.527
			Delta	162	1.000	0.977	1.023	0.995
2 or 3	SMI	Baseline	64	0.921	0.774	1.096	0.354	
		Time-varying	64	0.998	0.889	1.122	0.977	
		Delta	56	0.614	0.375	1.005	0.052	
	VAT	Baseline	64	0.999	0.973	1.025	0.925	
		Time-varying	64	1.002	0.989	1.016	0.714	
		Delta	56	0.984	0.947	1.023	0.430	
ER	Positive	SMI	Baseline	470	0.943	0.873	1.019	0.137
			Time-varying	470	0.965	0.899	1.036	0.321
			Delta	462	0.829	0.672	1.023	0.080
		VAT	Baseline	470	1.002	0.993	1.011	0.697
			Time-varying	470	1.002	0.995	1.009	0.660
			Delta	462	1.001	0.983	1.019	0.923
	Negative	SMI	Baseline	157	0.989	0.902	1.084	0.809
			Time-varying	157	1.019	0.946	1.097	0.623
			Delta	150	0.957	0.757	1.209	0.711
		VAT	Baseline	157	0.999	0.989	1.010	0.914
			Time-varying	157	1.002	0.992	1.011	0.715
			Delta	150	1.005	0.987	1.024	0.570

*Adjusting variables such as lymphovascular invasion, histologic grade, T stage, N stage, estrogen receptor, progesterone receptor, Ki-67 and adjuvant chemotherapy, except the subgroup variable, [†]Adjusting not only the above variables but also the predictor variable at baseline. CI = confidence interval, ER = estrogen receptor, HER2 = human epidermal growth factor receptor 2, HR = hazard ratio, SMI = skeletal muscle index, VAT = visceral adipose tissue area