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INTRODUCTION

Backgrounds

- Accurate staging is important in managing resectable non-small cell lung cancer (NSCLC).
- Guidelines recommend preoperative brain MRI for Stage III disease but generally not for neurologically asymptomatic Stage I disease.
- Recommendations for Stage II NSCLC remain inconsistent.

Aims

- Evaluate the association between pbrain MRI and survival across disease stages and histology.
- Assess whether the association differs by receipt of EGFR- or ALK-targeted TKIs, a proxy for actionable oncogenic alterations.

METHODS

Data: SEER-Medicare (2007-2019)

Primary Outcome

- Overall survival
- Lung cancer-specific survival
- Other-causes mortality as negative control outcome

Exposure: Preoperative brain MRI

Statistical Methods

- Inverse probability of treatment-weighting to account for measured confounding
- Weighted Cox regression

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- Preoperative brain MRI was substantially underused in routine care for resectable stage IIIa NSCLC.
- Preoperative brain MRI was associated with improved survival among patients with stage IIB–IIIa NSCLC.
- The association appeared histology-dependent, with the strongest signals observed in adenocarcinoma, and in patients receiving EGFR- or ALK-TKI.
- These real-world data support further evaluation of risk-adapted strategies for preoperative brain MRI.

Future Direction for Research

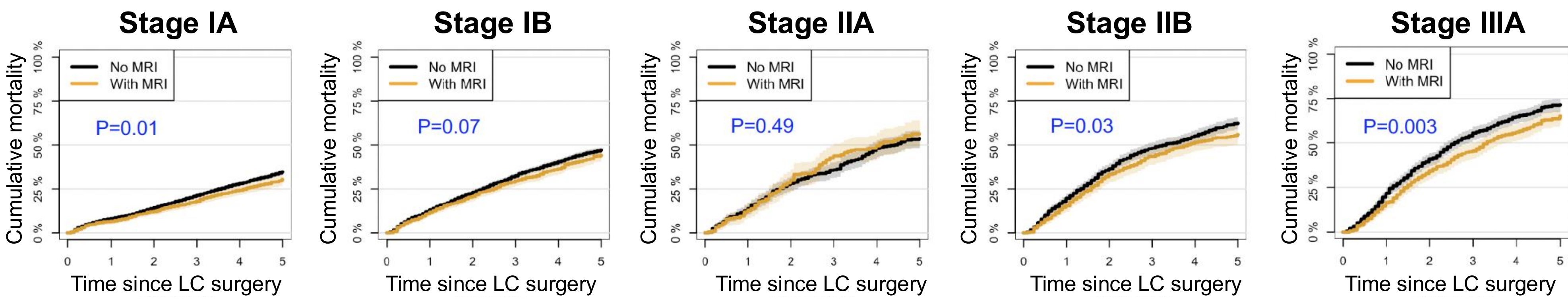
- Prospective studies are needed to validate these findings and evaluate the role of brain MRI across molecularly defined NSCLC subgroups.

RESULTS

Table 1. Effect of preoperative brain MRI on mortality by stage and histology, overall and in patients receiving EGFR- or ALK-targeted therapy

Analytic sample		N	Lung cancer-specific survival			Overall survival			Other-cause mortality		
			aHR	95% CI	P	aHR	95% CI	P	aHR	95% CI	P
All patients with Stage IA-IIIa NSCLC (2007-2019) who underwent curative-intent resection											
Overall		13520	0.91	0.84-0.99	0.04	0.87	0.82-0.93	<.001	0.81	0.73-0.91	<.001
By Stage	Stage IA	6089	0.94	0.77-1.14	0.54	0.89	0.78-1.02	0.10	0.85	0.71-1.03	0.09
	Stage IB	4159	0.92	0.80-1.07	0.30	0.87	0.78-0.98	0.02	0.79	0.65-0.96	0.02
	Stage IIA	691	1.30	0.99-1.72	0.06	1.11	0.87-1.41	0.39	0.72	0.44-1.18	0.20
	Stage IIB	1348	0.83	0.68-1.00	0.05	0.82	0.69-0.96	0.01	0.79	0.58-1.07	0.13
	Stage IIIA	1253	0.78	0.66-0.92	0.004	0.78	0.67-0.91	0.001	0.77	0.55-1.10	0.16
By Histology	AD	8472	0.95	0.85-1.08	0.41	0.94	0.86-1.02	0.17	0.92	0.79-1.08	0.32
	SQ	4465	0.87	0.76-1.01	0.06	0.81	0.72-0.90	0.002	0.72	0.60-0.85	0.002
	LC	316	0.75	0.48-1.16	0.20	0.77	0.53-1.12	0.18	0.78	0.39-1.55	0.48
	NSCLC/NO S	267	0.93	0.56-1.54	0.79	0.77	0.50-1.18	0.23	0.47	0.20-1.09	0.07
AD by Stage	Stage IA	4122	0.99	0.77-1.28	0.94	1.02	0.86-1.20	0.81	1.03	0.82-1.30	0.74
	Stage IB	2473	0.98	0.80-1.20	0.86	0.96	0.81-1.12	0.62	0.92	0.70-1.20	0.55
	Stage IIA	410	1.21	0.83-1.78	0.30	1.02	0.73-1.43	0.89	0.60	0.29-1.28	0.19
	Stage IIB	673	0.84	0.65-1.10	0.22	0.79	0.62-1.01	0.06	0.62	0.35-1.09	0.09
	Stage IIIA	795	0.77	0.62-0.95	0.01	0.76	0.63-0.93	0.01	0.74	0.44-1.25	0.27
SQ by Stage	Stage IA	1740	0.86	0.59-1.25	0.44	0.74	0.57-0.95	0.02	0.68	0.46-0.94	0.02
	Stage IB	1471	0.87	0.69-1.09	0.24	0.80	0.66-0.95	0.01	0.70	0.53-0.94	0.01
	Stage IIA	255	1.30	0.83-2.04	0.24	1.16	0.79-1.71	0.43	0.90	0.43-1.87	0.77
	Stage IIB	611	0.74	0.55-1.00	0.06	0.79	0.62-1.01	0.06	0.89	0.60-1.31	0.56
	Stage IIIA	388	0.89	0.66-1.20	0.45	0.87	0.66-1.13	0.31	0.81	0.47-1.37	0.43
Patients receiving EGFR- or ALK-targeted therapy											
Overall		394	0.81	0.59-1.10	0.18	0.81	0.61-1.08	0.16	0.86	0.30-2.49	0.79
By Stage	Stage IA+IB	204	1.16	0.71-1.89	0.53	1.18	0.74-1.87	0.48	1.30	0.32-5.20	0.70
	Stage IIA+IIB	110	0.39	0.19-0.80	0.01	0.38	0.19-0.77	0.007	0.18	0.01-2.97	0.23
	Stage IIIA	90	0.99	0.54-1.81	0.98	1.06	0.60-1.90	0.81	2.44	0.36-16.4	0.35
By Histology	AD	349	0.87	0.62-1.23	0.44	0.87	0.63-1.20	0.40	0.86	0.31-2.35	0.77
	Non-AD	45	0.31	0.01-0.07	0.005	0.31	0.13-0.71	0.005	N/A		

Fig 2. Cumulative incidence of all-cause mortality by brain MRI status by stage.



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Fig 1. Flow diagram of cohort selection

