

Inflammatory Biomarkers as a Prognostic Scoring Model for Peritoneal Malignant Mesothelioma

Keval Yerigeri, Jeevan Puthiamadathil, Betsy Morrow, Seth Steinberg and Raffit Hassan

Thoracic and GI Malignancies Branch, Center for Cancer Research,
National Cancer Institute, Bethesda, MD



Introduction

- Malignant mesothelioma (MM) – aggressive tumor commonly originating in the pleura or **peritoneum**
- Induced by chronic inflammatory processes such as **asbestos exposure** and **high-dose radiation**
- Prognosis is poor; median overall survival (mOS) is only 12 months
- Early-stage MM has significantly better outcomes with aggressive treatment, but few *prognostic* indicators can inform clinical decision-making
- FDA has one approved *diagnostic* marker: **MESOMARK assay** of soluble mesothelin-related peptide (SMRP), but its sensitivity is only 64%
- Schneider et al. (2014) study inversely correlated SMRP level past cutoff of 1.35 nmol/L with survival
- Multivariate analysis correlated lymphocyte-to-monocyte ratio below 2.74 cutoff with lower mOS
- Inflammatory biomarkers** are readily accessible through routine labs – can they serve as a reliable alternative to SMRP and the MESOMARK assay?

Methods

- Protocol NCI-13-C-2002:** Tissue Procurement and Natural History Study of Patients with MM and other Mesothelin-Expressing Cancer
- 448 patients enrolled from 2013 – 2021; **159** selected for peritoneal origin and inflammatory biomarker values within 7 days of protocol consent date
- Lab values drawn from the Biomedical Translational Information System (BTRIS) or Labmatrix

Disease status divided into 3 categories:

- **New** – NO treatment of any form
- **Active** – treatment within past 90 days OR pending plan
- **Surveillance** – NO treatment within 90 days or plan

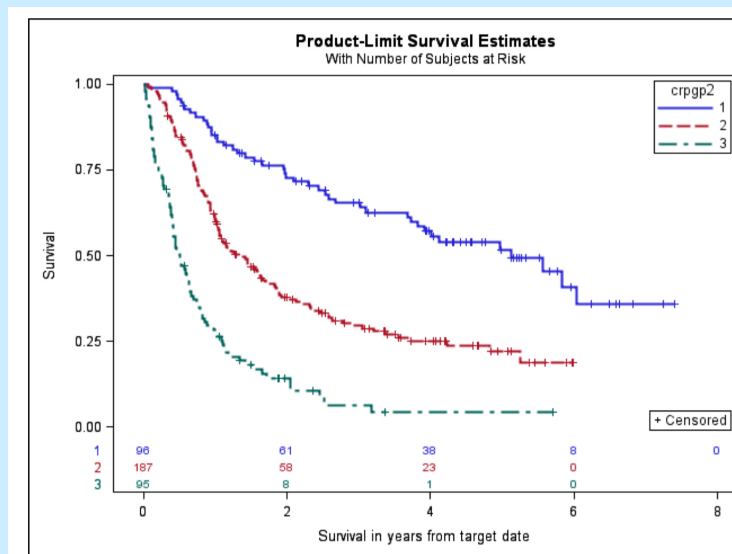
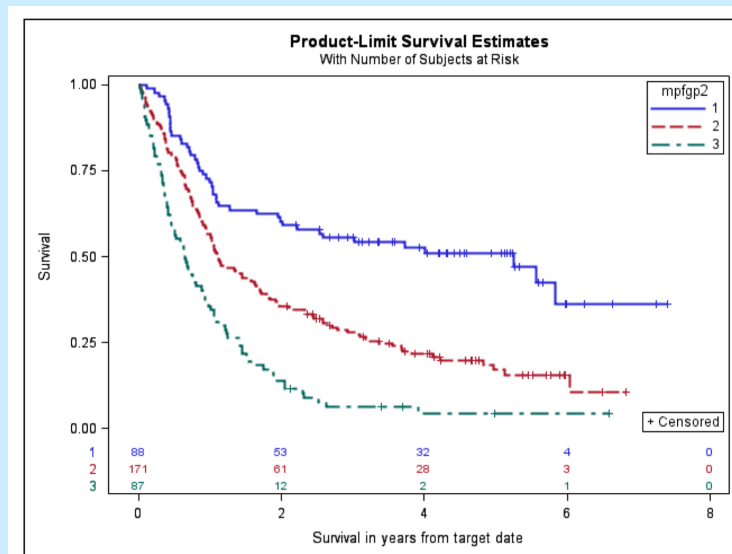
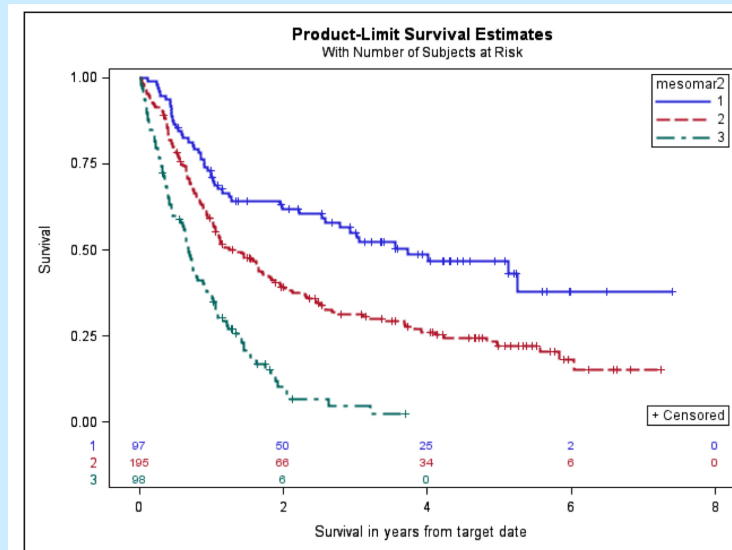
	Peritoneal (n = 159)	
	No.	%
New	7	4.4
Active	122	76.7
Surveillance	30	18.9
	Average	Median
Age of Diagnosis	50.8	52.0
Age of Enrollment	54.4	56.7
Survival Days	1574.4	1172.5

- Lab values analyzed for 4 inflammatory biomarkers: megakaryocyte-potentiating factor (**MPF**), C-reactive protein (**CRP**), **CA125** and **fibrinogen**
- Subjects stratified into quartiles per biomarker values
- Quartiles compared for survival with **Kaplan-Meier curves** (all P-values < 0.0001 per log-rank tests)

Results

Kaplan-Meier Curves

Blue line – bottom 25% biomarker values
Red line – middle 50% (quartiles combined)
Green line – top 25%



MESOMARK

2 / 4-Year Survival

73% / 39%
53% / 20%
21% / 5%

MPF

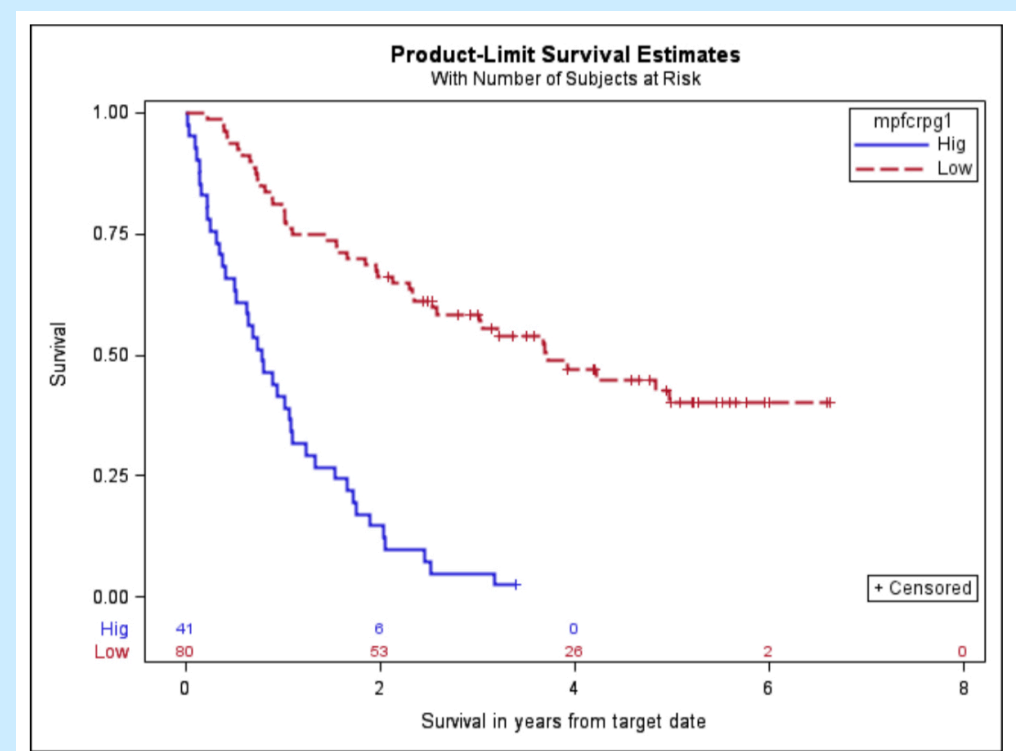
2 / 4-Year Survival

61% / 34%
46% / 17%
19% / 0%

CRP

MPF/CRP Scoring Model

COX regression models employed to identify ideal covariates for joint evaluation of survival



Discussion

- ✓ Final scoring model reveals drastic difference in survival curves between patients with higher and lower MPF/CRP levels
- ✓ Model requires refinement due to arbitrary selection of quartile system
- ✓ **Prognostic models may inform aggressive versus palliative treatment approach**