



ASSESSING THE IMPACT OF MARGINALIZATION ON SURVIVAL FOR PATIENTS UNDERGOING AUTOLOGOUS STEM CELL TRANSPLANT IN ONTARIO, CANADA

A. Suleman¹, S. Podolsky², N. Liu², K. Chan^{1,2,3}, S. Arya^{1,4}, L.K. Hicks^{1,5}, M.C. Cheung^{2,3}, A. Prica⁶

- 1 – Department of Medicine, University of Toronto, Toronto, Ontario, Canada
- 2 – Institute for Clinical Evaluative Sciences (ICES), Toronto, Ontario, Canada
- 3 – Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada
- 4 – Canadian Blood Services, Toronto, Ontario, Canada
- 5 – St. Michael's Hospital, Toronto, Ontario, Canada
- 6 – Princess Margaret Cancer Centre, Toronto, Ontario, Canada



INTRODUCTION

- Recent evidence suggests lower rates of autologous stem cell transplant (ASCT) for patients living in rural settings and for ethnic minority groups¹.
- Few population-based studies have assessed comprehensive indices of marginalization as predictors of outcomes after ASCT.
- In a publicly funded healthcare setting, it is crucial to understand if various aspects of marginalization interact to ultimately impact survival for patients undergoing ASCT.

AIM

We aimed to assess how marginalization status, based on the Ontario Marginalization Index (ON-Marg), impacts overall survival after autologous stem cell transplant for lymphoma or myeloma.

METHODS

- Retrospective population-based study** using administrative healthcare databases from Ontario, Canada
- Inclusion Criteria:**
 - ASCT for lymphoma between 2010-2022
 - ASCT for myeloma between 2010-2022
- Ontario Marginalization Index (ON-Marg):**
 - Residential instability (referring to housing instability)
 - Material deprivation (referring to individual and community abilities to access basic material needs)
 - Dependency (referring to lack of income from employment)
 - Ethnic concentration (referring to individuals who are recent immigrants or belonging to a visible minority group)
 - Categorical variable based on quintiles
 - Q1 – least marginalized
 - Q5 – most marginalized
- Primary outcome:** 2-year overall survival (OS) from date of transplant
 - Multivariable Cox regression analyses

RESULTS

ASCT for Lymphoma

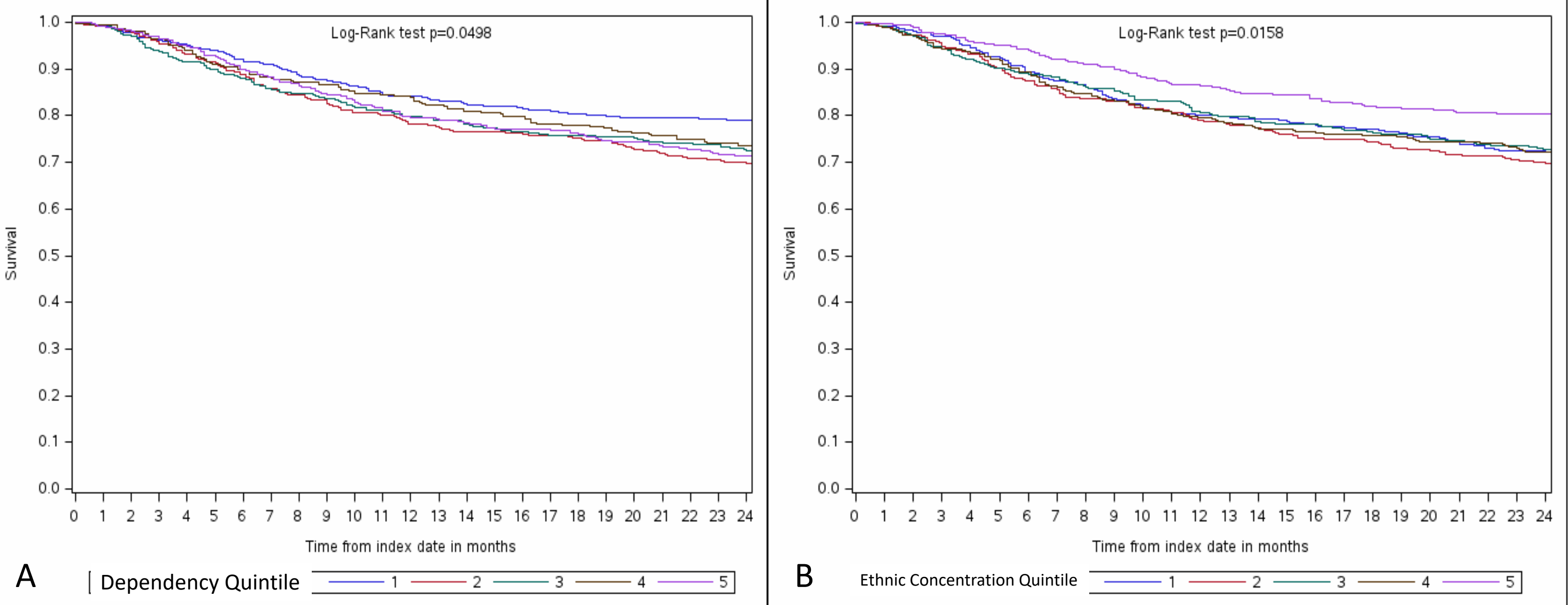


Figure 1. 2-year overall survival probabilities based on ON-Marg Dependency quintile (Panel A) and Ethnic Concentration quintile (Panel B) for patients undergoing ASCT for lymphoma.

ASCT for Myeloma

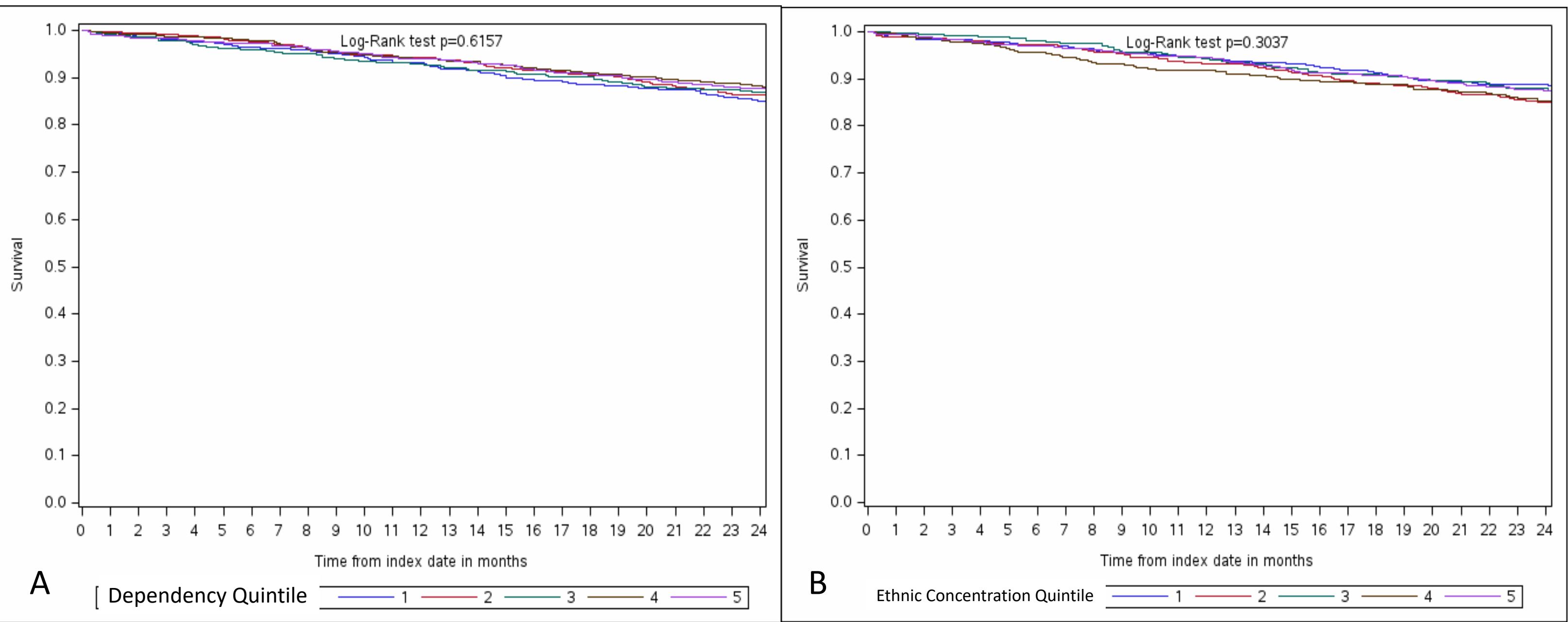


Figure 2. 2-year overall survival probabilities based on ON-Marg Dependency quintile (Panel A) and Ethnic Concentration quintile (Panel B) for patients undergoing ASCT for myeloma.

Survival Outcomes:

- 2-year OS for patients undergoing ASCT for lymphoma in the fifth quintile of marginalization of the ethnic concentration index was 80.4% (95% CI 75.9-84.1%), compared to 72.3% (95% CI 67.5-76.5%) in the first quintile
- 2-year OS for patients undergoing ASCT for myeloma in the fifth quintile of marginalization of the ethnic concentration index was 88.8% (95% CI 85.8-91.2%) in quintile 1 and 87.5% (95% CI 84.7-89.8%) in quintile 5

Demographics:

- 1886 patients
- 64% of patients were male
- Median age of 56 years (IQR 44-63)
- 22% of patients had high aggregated diagnosis group comorbidity scores

Demographics:

- 2842 patients
- 58% of patients were male
- Median age of 61 years (IQR 55-66)
- 25% of patients had high aggregated diagnosis group comorbidity scores

Table 1. Results of a Cox regression analysis assessing the impact of baseline demographic features on survival based on marginalization quintile of ethnic concentration.

Demographic Features		Autologous transplant for lymphoma	Autologous transplant for myeloma
		Hazard ratio (95% CI)	Hazard ratio (95% CI)
Marginalization Quintile (Reference: Quintile 1-least marginalized)	Quintile 2	1.15 (0.88-1.50)	1.32 (0.95-1.84)
	Quintile 3	1.02 (0.77-1.35)	1.08 (0.75-1.55)
	Quintile 4	1.073 (0.80-1.44)	1.29 (0.90-1.84)
	Quintile 5-most marginalized	0.71 (0.52-0.99)	1.04 (0.72-1.52)
Age		1.02 (1.01-1.03)	1.00 (0.99-1.02)
Sex (Reference: Male)	Female	0.99 (0.82-1.18)	0.87 (0.72-1.10)
Comorbidity burden (Reference: Quartile 1-lowest)	Quartile 2	1.32 (1.02-1.69)	1.77 (1.27-2.46)
	Quartile 3	1.18 (0.90-1.52)	1.86 (1.34-2.57)
	Quartile 4-highest	1.81 (1.41-2.32)	2.17 (1.58-2.98)
Distance in kilometers (km) to transplant centre (Reference: < 50 km)	50-100 km	0.95 (0.74-1.21)	0.88 (0.65-1.21)
	100-150 km	1.20 (0.86-1.69)	1.02 (0.66-1.59)
	150-200 km	0.53 (0.30-0.94)	1.74 (1.24-2.45)
	>200 km	1.09 (0.74-1.61)	0.95 (0.60-1.50)

CONCLUSIONS

- Patients undergoing ASCT for lymphoma in Q5 of ethnic concentration had improved 2-year OS compared to patients in Q1
- Possible explanations: healthy immigrant effect, cultural protective factors
- Patients undergoing ASCT for lymphoma who lived farther from the transplant center had a lower risk of death - more highly selected based on fitness and disease biology to be referred for transplant
- No impact on OS based on marginalization quintile for patients undergoing ASCT for myeloma
- Further work is needed to ensure that all eligible patients receive ASCT.

ACKNOWLEDGEMENTS

This study was supported by ICES, which is funded by an annual grant from the Ontario Ministry of Health (MOH) and the Ministry of Long-Term Care (MLTC). The analyses, conclusions, opinions and statements expressed herein are solely those of the authors and do not reflect those of the funding or data sources.

CONTACT INFORMATION

Adam.Suleman@mail.utoronto.ca

@adamsuleman03