

Impact of Intraoperative Blood Transfusions on Survival Rates in Ovarian Cancer Patients

Steven Benyahia¹, BA; Yi Luo², PhD; Emily Coughlin¹, MPH; Robert Wenham², MD, Jeffery Huang², MD
USF Morsani College of Medicine¹, Moffit Cancer Center²

Background

- Ovarian cancer is a leading cause of gynecologic cancer-related mortality globally.
- High mortality is often due to late diagnosis, with only a 31% survival rate for stage IV patients
- Surgical debulking followed by chemotherapy is the standard treatment approach
- This study investigates the impact of operative and perioperative factors, particularly blood transfusions and hospital stay length, on survival outcomes in ovarian cancer patients

Methods

- Retrospective study of 314 ovarian cancer patients undergoing surgery between 2010 and 2018 at Moffitt Cancer Center.
- Collected data: demographics, tumor characteristics, intraoperative factors (e.g., estimated blood loss, transfusions), and postoperative measures (e.g., readmissions, length of stay).
- Statistical analyses included log-rank, chi-square, and Mann-Whitney U tests to evaluate survival outcomes; significance was set at $p < 0.05$.

Results

- Hospital stays >3 days correlated with decreased survival ($p=0.015$).
- Blood transfusions were associated with significantly lower survival (42.0 months vs. 53.1 months, $p < 0.001$).
- Higher mortality was linked to increased estimated blood loss ($p=0.015$) and longer surgery duration ($p=0.002$).
- No significant survival difference by age, BMI, or smoking history

Table 1: Demographics

	Total (N=314)	No death (N=243)	Death (N=71)	p-value
History of smoking	118 (37.6)	91 (37.4)	27 (38.0)	.929
Stage				<.001
1	70 (22.9)	66 (27.8)	4 (5.8)	
2	26 (8.5)	24 (10.1)	2 (2.9)	
3	150 (49.0)	108 (45.6)	42 (60.9)	
4	60 (19.6)	39 (16.5)	21 (30.4)	
BMI	29.84 ± 7.32	29.76 ± 7.11	30.14 ± 8.04	.873
Age			63.63 ± 10.96	.274
	62.28 ± 12.08	61.88 ± 12.38		
Clinical Tumor Size (cm)				.475
	10.84 ± 6.21	11 ± 6.32	10.15 ± 5.75	
Pathological Tumor Size (cm)	37.25 ± 109.05	39.25 ± 117.97	29.09 ± 60.84	.479

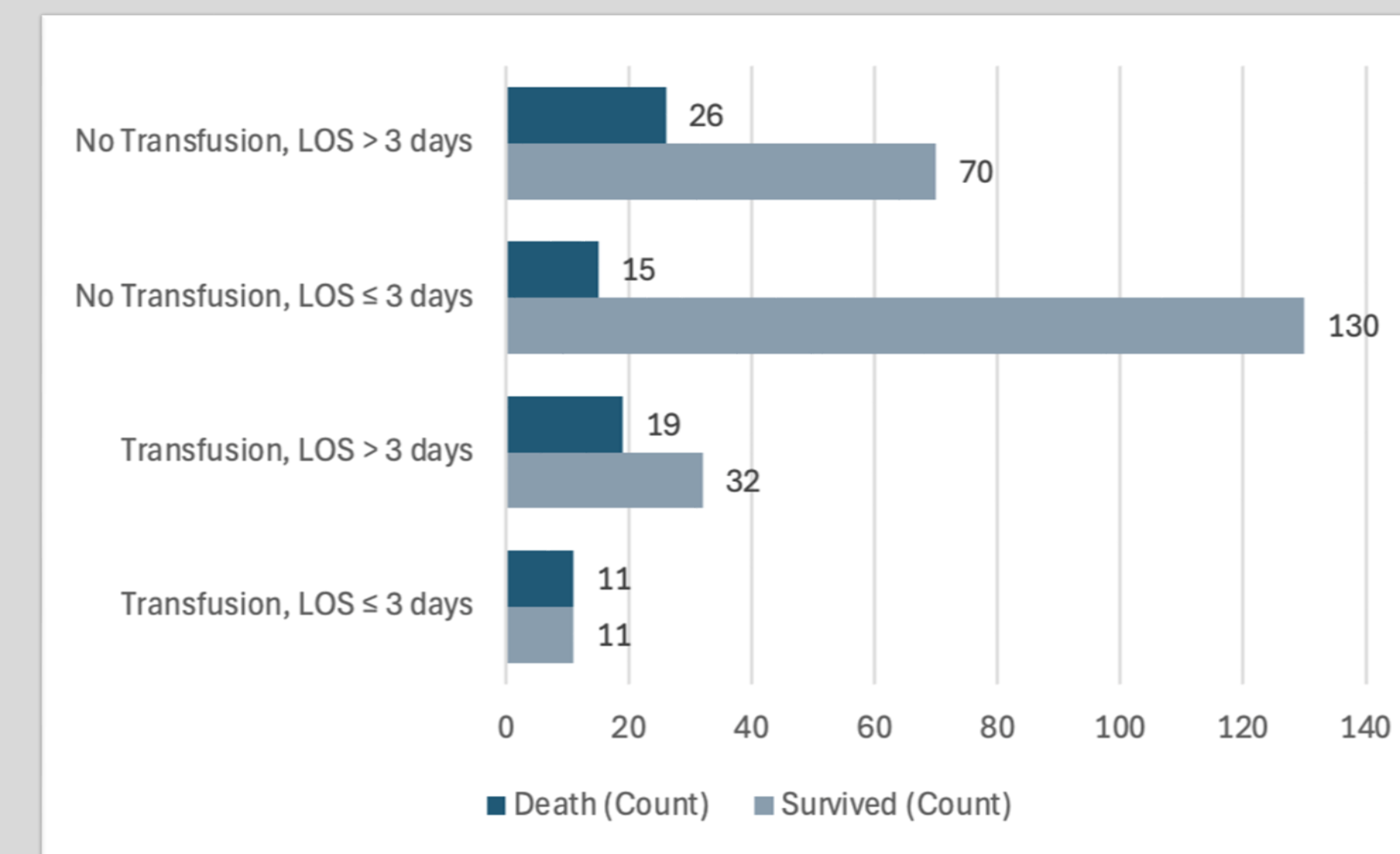
Table 2: Outcomes by Mortality

	Total (N=314)	Survived (N=243)	Death (N=71)	p-value
Readmission				.021
1	179 (57.0)	147 (60.5)	32 (45.1)	
>1	135 (43.0)	96 (39.5)	39 (54.9)	
LOS				<.001
3. days	167 (53.2)	141 (58.0)	26 (36.6)	
>3 days	147 (46.8)	102 (42.0)	45 (63.4)	
Transfusion				<.001
No	241 (76.8)	200 (82.3)	41 (57.7)	
Yes	73 (23.2)	43 (17.7)	30 (42.3)	
Chemo duration (days)	78.08 ± 40.58	75.91 ± 39.04	82.52 ± 43.68	.477

Table 3: Intra-op and Post-op measures

	Total (N=314)	Survived (N=243)	Death (N=71)	p-value
Intraoperative Temperature (Celsius)	34.23 ± 4.51	34.12 ± 4.63	34.59 ± 4.11	.498
Intraoperative electrolyte (Plasmalyte) (mL)	2538.49 ± 1246.7	2433.68 ± 1232.62	2906.13 ± 1235.03	<.001
Intraoperative albumin (mL)	629.53 ± 511.26	608.34 ± 554.6	696.25 ± 337.67	.026
Estimated blood loss (EBL) (mL)	462 ± 557.22	426.23 ± 539.01	582.28 ± 603.18	.015
Foley catheter placement duration (minutes)	521.39 ± 319.34	510.74 ± 326.17	557.68 ± 294.27	.112
Packed red blood cells (mL)	945.12 ± 833.65	971.53 ± 555.71	907.27 ± 1129.45	.121
Surgery Duration	257.02 ± 92.44	246.62 ± 85.96	292.61 ± 104.98	.002
Anesthesia total time (minutes)	318.1 ± 115.35	307.59 ± 107.61	368.26 ± 138.04	.004
Post-anesthesia care unit (PACU) duration (minutes)	168.07 ± 206.94	167.94 ± 211.29	168.52 ± 192.87	.886

Figure 1: Association of Blood Transfusion and Hospital Stay Duration with Mortality in Ovarian Cancer



Discussion

- Prolonged hospital stays may indicate complex surgeries or complications, adversely affecting survival.
- Intraoperative blood transfusions potentially contribute to immunosuppression and poorer oncological outcomes.
- Minimizing transfusions and optimizing surgical efficiency are potential strategies for improving survival outcomes.
- Higher tumor stage remained a critical predictor of survival, underscoring the importance of early detection and intervention.

Conclusion

- Extended hospital stays and intraoperative blood transfusions are associated with poorer survival outcomes in ovarian cancer patients.
- Strategies targeting a reduction in the need for transfusions and hospital stays could enhance survival.
- Further prospective randomized control study is warranted to refine perioperative care in ovarian cancer.