Lymph Node Yield Differences By Facility Operative Volume And Surgical Approach In Gastric Cancer: An NCDB Analysis

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Background

Lymph node yield is a key quality indicator associated with accurate staging in surgically resected gastric cancer. Appropriate lymph node resection (ALNR) for gastric cancer has been defined as ≥16 lymph nodes resected for proper staging, although in practice, this number is not always achieved and may be affected by surgical expertise and approach. The present study aimed to identify differences between hospital volumes and surgical approach on lymph node yield and rates of appropriate lymph node resection (ALNR).

Methods

Patients diagnosed with Stage I-IV gastric cancer who underwent surgery between 2004-2018 were identified in the National Cancer Database (NCDB) and categorized into 2 groups by hospital case volume. Descriptive and statistical analyses including a regression analysis evaluating the independent impact of hospital volume on ALNR were performed.

Results

The NCDB included 1,127 hospitals, that contributed 9,545 gastric cancer cases. Median and maximum total hospital volumes were 14 and 151 cases, respectively.
Hospital volume cohort categorization:

- **Low-volume hospitals (LVH)** (≤ 13 cases/year), including 933 hospitals and contributed a total of 4,709 cases.
- **High-volume hospitals (HVH)** (14 -151 cases/year), including 194 hospitals and contributed a total of 4,836 cases.

Lymph node yield by Facility Operative Volume:

- The mean lymph node yield in HVH was higher than in LVH (28 [SD 13.6] vs. 27 [SD 14.0])
- HVH more frequently achieved ALNR (61.2%) compared to LVH (48.6%), p=<0.001.
- After controlling for relevant factors, HVH showed higher likelihood of ALNR (Reference: LVH, HVH: OR 1.61, 95%- CI [1.36-1.86]).

	Low-volume hospitals (n=4,709)		High-volume hospitals (n=4,836)		P - value
	MIS	Open	MIS	Open	
Case number, %	339 (7.1)	4,370 (92.8)	569 (11.7)	4,267 (88.3)	<0.001
ALNR, %	149 (43.9)	2,139 (48.9)	370 (65)	2,589 (60)	<0.001
Mean lymph node yield, SD	16.4 (13.3)	17.8 (13.7)	22.7 (15.4)	20.8 (14)	<0.001

Conclusions

Gastric cancer resections performed in HVH were more likely to have a higher ALNR rate and higher lymph node yield with MIS and open procedures compared to LVH. These disparities could impact patient outcomes, and lymphadenectomy optimization in open and minimally invasive surgery approaches may lead to improved staging and patient outcomes.

References:

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