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Research letter: Oncological treatment reported by the Finnish Cancer Registry compared to given neoadjuvant treatment in patients undergoing esophagectomy for cancer—A nationwide study

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Keywords

Esophageal cancer, esophagectomy, esophagus, neoadjuvant therapy, registry, validation, surgery

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Neoadjuvant therapy increases esophageal cancer survival.¹ Data on oncological treatments in the Finnish Cancer Registry (FCR) are in research often used to estimate whether patients received neoadjuvant treatment or not. Nordic national registry data are generally valid,^{2,3} but no studies on using oncological treatment data in the FCR to estimate neoadjuvant treatment exist.

The aim was to evaluate the completeness and concordance of FCR data, compared with neoadjuvant treatment according to patient records.

This population-based nationwide study in Finland included all patients undergoing esophagectomy for cancer during 2010 to 2016. The ethical committee in Northern Ostrobothnia (EETMK 115/2016), and other relevant bodies and agencies approved the study.⁴

The FCR maintains an accurate national registry of all cancers in Finland.⁵ Oncological treatments in the FCR by modality are reported with specifications: “curative, palliative, or unclear intent” and “under or over 4 months from diagnosis.” Whether each modality is neoadjuvant or adjuvant therapy is not specified. Patients receiving any oncological treatment


during 4 months from diagnosis in FCR were classified neoadjuvant treated, as all underwent surgery. Neoadjuvant treatment modalities were classified into (1) chemotherapy, (2) radiotherapy, and (3) chemoradiotherapy.

The Finnish National Esophago-Gastric Cancer Cohort (FINEGO) was the “gold standard” comparison, described in detail elsewhere.⁴

The main variable of interest was neoadjuvant therapy (yes/no). Second, modalities were assessed separately. Positive predictive value (PPV), concordance, and completeness were calculated.

Of the 562 patients who underwent esophagectomy, 555 (98.8%) had patient records available. Cancer registry record was found for 488 (86.8%) patients. Of the 562 patients, 241 (42.9%) were excluded due to missing FCR data, resulting in 321 (57.1%) patients with complete data on received neoadjuvant treatment. For neoadjuvant treatment modality, there were 306 (54.4%) patients with complete data. The proportions of received neoadjuvant therapy were similar between included patients and those with missing FCR data.

For those with FCR record, oncological treatment data completeness was 65.8%. PPV and

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Table 1. Any oncologic treatment following 4 months of diagnosis in comparison to given neoadjuvant therapy and different oncological therapy modalities reported in FCR in comparison to corresponding neoadjuvant therapy modality.

	<i>n</i>	Concordance, % (<i>n</i>)		
Neoadjuvant therapy	321	80.7 (259)		
Neoadjuvant therapy type	306	74.8 (229)		
<i>PPV for neoadjuvant therapy</i>				
<i>Neoadjuvant treatment in patient records (n)</i>				
		Yes	No	Total
Any oncologic treatment within 4 months of diagnosis (<i>n</i>)	Yes	171	19	190
	No	43	88	131
	Total	214	107	321
PPV 90.0% (171/190)				
<i>PPV for neoadjuvant treatment types</i>				
<i>Chemotherapy in patient records (n)</i>				
		Yes	No	Total
Chemotherapy in the FCR (<i>n</i>)	Yes	97	14	111
	No	31	164	195
	Total	128	178	306
PPV 87.4% (97/111)				
<i>Radiotherapy in patient records (n)</i>				
		Yes	No	Total
Radiotherapy in the FCR (<i>n</i>)	Yes	3	13	16
	No	0	290	290
	Total	3	303	306
PPV 18.8% (3/16)				
<i>Chemoradiotherapy in patient records (n)</i>				
		Yes	No	Total
Chemoradiotherapy in the FCR (<i>n</i>)	Yes	41	7	48
	No	27	231	258
	Total	68	238	306
PPV 85.4% (41/48)				

FCR: Finnish Cancer Registry; PPV: positive predictive value.

concordance were 90.0% and 80.7% for neoadjuvant treatment. For neoadjuvant treatment modalities, the completeness was 62.7%; PPVs were 87.4% for chemotherapy, 18.8% for radiotherapy, and 85.4% for chemoradiotherapy; and the concordance was 74.8% (Table 1).

The completeness of oncologic treatment data in the FCR was lower than expected. This issue is discussed in detail elsewhere.⁶ The oncological treatment within 4 months of diagnosis in the FCR was highly concordant with received neoadjuvant therapy in esophagectomy patients. This analogy suggests that

it is accurate enough for surgical research. Due to a considerable amount of missing FCR records and records with unclear treatment status, FCR-derived neoadjuvant therapy variable is recommended to be used acknowledging its limitations. Even though FCR data can estimate single modalities fairly well, it is too inaccurate and incomplete for the derivation of specific neoadjuvant treatment types.

The main strengths include the population-based design and the complete and high-quality data of the comparison cohort. Limitations include missing records and missing oncological treatment data in the FCR. However, the proportions of neoadjuvant treatment were similar in those with and without FCR data, suggesting that the data are missing at random.

A relatively large portion of the data reported as “unclear” could be explained by passive reporting of treatments to the FCR, which have decreased over time.⁵ The current form of treatment notifications, which can be multiple or retrospective, can lead to contradictory or missing treatment information, leading to missing and unclear labels in the FCR.

In conclusion, FCR oncological treatment data correspond to received neoadjuvant treatment reasonably well, with an unexpectedly high proportion of missing data (missing at random). FCR-derived neoadjuvant treatment data should be used in research acknowledging its limitations.

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Ethical statement

The study has been approved by the Ethical Committee in Northern Ostrobothnia (EETMK 115/2016), and governmental agencies and hospital districts involved in the study. The requirement for individual consent was waived by the Finnish Institute for Health and Welfare.

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