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LETTER TO THE EDITOR

Accuracy of Essential TNM to stage large colorectal (T3/T4) cancers in absence of nodal status information

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Introduction

In public health, the incidence of cancer by stage at diagnosis contributes to a better description of disease burden, guides cancer control planning activities and is an important indicator in the evaluation of the impact of early detection and screening [1,2]. Despite this, abstracting stage data has proved difficult for population-based cancer registries (PBCR), particularly in less developed settings. To facilitate staging when there are missing elements of Tumour (T), Node (N) or Metastasis (M), or Stage group in the clinical record, Essential TNM -a complement to the TNM Classification- was developed [3]. Essential TNM guidelines assume that if there is no mention of M, or of N, one assumes they are absent [4].

For colon cancers, the presence of regional nodes may be rather poorly recorded (particularly in low-income settings, without access to CT scans/MRI), and they would be coded as NX using TNM [4]. However, Essential TNM instructions indicate that when there is no mention of regional node metastases in the clinical record, they are considered to be absent (R-). Such cases will be classified either as A -Advanced (which includes tumours that may be either T3/T4) if they have invaded through the bowel wall or L-Localized (T2/T1), corresponding to TNM to Stage II and Stage I, respectively (Figure 1) [3].

It has been shown that there is a significant association between colorectal cancers with a higher T-classification and larger size, and a bigger number of sampled nodes, which results in more lymph node-positive tumours [5,6]. Thus, if enough nodes are sampled, large tumours (T3/T4) are likely to have regional node involvement, so that most would be Stage III rather than Stage II. Therefore, the stage assigned using Essential TNM in the absence of information on regional nodes for large colorectal cancers (T3/T4) – Stage II- could represent an under-staging.

The aim of our study was to review the staging of colorectal cancer from cancer registries in three regions of the world to see whether the above proposition – that the majority of T3/T4 tumours are node-positive – is correct.

Methods

We gathered information on the nodal status of colorectal cancers by tumour size, with the participation of selected population-based and hospital-based cancer registries in different continents.

Data for varying periods between 2010 to 2017, were provided by 9 African population-based cancer registries pertaining to the African Network of Cancer Registries AFCRN (Abidjan, Bamako, Bulawayo, Cotonou, Eldoret, Harare, Kampala, Namibia, Nairobi), two Latin American population-based cancer registries (Quito and Uruguay), one Latin American hospital-based registry (Bogota, Colombia) and by the US SEER-18 registry as well. Supplementary Appendix Table 1 details the number of cases provided by each of the contributing cancer registries in Africa and in Latin America as well as the corresponding period for each. Cases from the US SEER registries were diagnosed in 2010–2015.

We asked registries to focus on large tumours (T3: tumour invading subserosa, or non-peritonealised pericolic or perirectal tissues; T4: tumour directly invades other organs or structures and/or perforates visceral peritoneum).

Results

Table 1 illustrates the distribution of nodal status by tumour size for advanced (T3/T4) colorectal cancer cases. The majority (124,177 of 125,916, 98.6%) had information on regional lymph nodes. The percentage of advanced (T3/T4) colorectal cancer cases without information on lymph nodes (NX)

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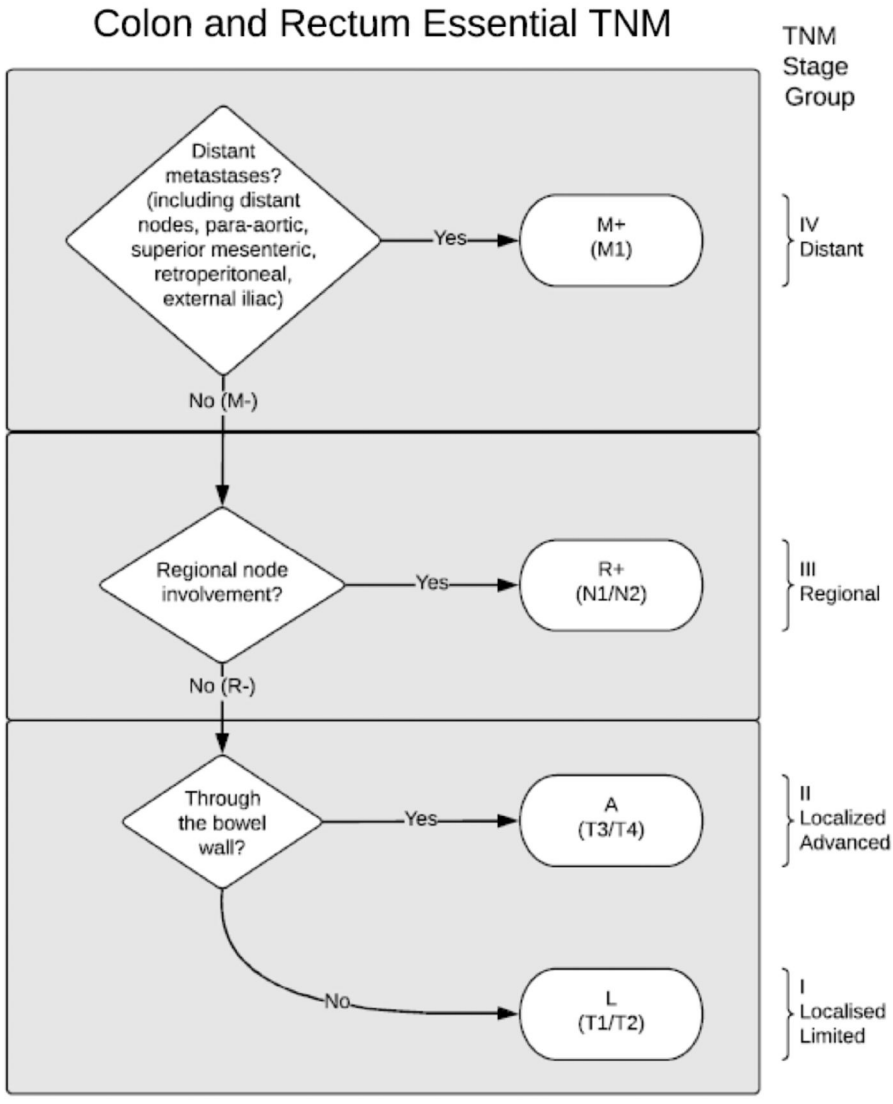

Figure 1. Essential TNM Flowchart for colorectal cancer staging [4].

varied among regions representing 16.4% for the African registries, 7.7% in Latin America and 1.1% in the US) (Table 1).

Except for the cases provided by African registries, positive nodes were more frequent among T4 cancers when compared with T3 cancers. Among all T3/T4 (combined) colorectal cancers with information available on regional nodes (i.e., not NX), positive nodes (N+) were reported in 52.5% of the cases, with almost no variation between the regions included.

Discussion

We describe the status of regional lymph nodes among advanced (T3/T4) colorectal cancer cases in different settings. Among those cases with information on regional nodal status (i.e., not NX) around half had positive nodes. This implies that, when applying the Essential TNM schema for colorectal cancer cases, where the nodal status is not clearly mentioned in the clinical record, T3/T4 cases would be correctly staged

Table 1. TNM Regional nodes status (*N*) in cases of advanced (T3/T4) colorectal cancer from selected cancer registries in different countries.

	Regional nodes						
	N0		N+		NX		
Tumour size	*n*	%	*N*	%	*n*	%	Total
Africa							
T3	38	43.7	39	44.8	10	11.5	87
T4	24	33.3	32	44.4	16	22.2	72
T3 + T4	62		71		26	**16.4**	159
N+[a] (%)			**53.4**				
Latin America							
T3	1337	45.1	1419	47.8	210	7.1	2966
T4	500	37.6	710	53.3	121	9.1	1331
T3 + T4	1837		2129		331	**7.7**	4297
N+[a] (%)			**53.7**				
USA							
T3	44,640	49.9	44,281	49.5	510	0.6	89,431
T4	11,459	35.8	19,698	61.5	872	2.7	32,029
T3 + T4	56,099		63,979		1382	**1.1**	121,460
N+[a] (%)			**53.3**				
TOTAL							
T3	46,015	49.8	45,739	49.5	730	0.8	92,484
T4	11,983	35.8	20,440	61.1	1009	3.0	33,432
T3 + T4	57,998		66,179		1739	**1.4**	125,916
N+ [a] (%)			**53.3**				

[a]*N*+ amongst T3/T4 with *N* information *N* (N0,N+).

(as stage III) in half of the cases, and under-staged (Stage II rather than Stage III) in the other half.

Nevertheless, our results also show that the percentage of advanced colorectal cancer cases with no information on regional nodes involvement is low – even in Africa, where it was less than one in six. This is encouraging and is probably mainly related to the fact that staging at the moment of diagnosis includes surgical exploration [4] with evidence from different settings that more than 65% of colorectal cancer patients undergo resection surgery [7,8]. This may contribute to better information on regional nodes and staging at diagnosis without necessarily requiring sophisticated imaging methods. However, in the African setting where registries work is mainly paper-based as compared with the US, the possibility of incomplete clinical records or surgical notes from which the registrars abstract the data is much higher and may contribute to the rather small number of cancer cases we had from this region.

Our results also showed that larger T4 cancers were more often node-positive compared to T3 cancers, as reported previously. Nonetheless, T3 tumours were almost three times more frequent than T4 tumours.

We did not differentiate colon from rectal cancers as the staging instructions are the same, both for TNM and Essential TNM. However, it is relevant to consider that for rectal cancer, neoadjuvant therapy is frequent and staging at diagnosis might pose more problems than for colon cancers as it will depend on the availability of sophisticated imaging methods. In addition, those cases require more attention when abstracting information from the record to correctly identify the stage before neoadjuvant therapy.

The estimation of under-staging, when information on lymph node status is missing, assumes that it is missing at random. It is possible that the absence of any mention of regional nodes in a clinical record implies that they are more likely to have been absent (N0). We did not collect information on the number of nodes collected, which would have provided additional interesting information.

Improving stage data that can provide meaningful public health information is necessary at many levels and through diverse actions. Amongst these are achieving better documentation of stage in clinical records and pathology reports in the first place. In addition, cancer registries need to start collecting this valuable information, and if resources are scarce, it is worth to prioritizing cancers that are amenable to early detection. Of relevance also is promoting education on the use of cancer staging and its terminology, as well as promoting the use of a uniform classification system [9].

Conclusions

Based on our findings, and in the light of the aforementioned considerations, the currently existing Essential TNM instructions and flowcharts for colorectal cancer will remain unchanged; this is further reinforced with recently published evidence that Essential TNM has good accuracy for colorectal cancer [10]. However, we invite the registry community to use full TNM for staging whenever possible and to note that, for large (T3/T4) tumours without information on nodes, there will be some under-staging when using Essential TNM.

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Disclosure statement

No potential conflict of interest was reported by the author(s). Where authors are identified as personnel of the International Agency for Research on Cancer/World Health Organization, the authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the International Agency for Research on Cancer/World Health Organization.

Data availability statement

Disaggregated data on large colorectal cancers (T3/T4) from the individual cancer registries that contributed for Africa (*via* the AFCRN) and for Latin America to this study are available in Supplementary Appendix Table 1. Co-authors affiliated to the individual participating registries in this study can be contacted for the data.

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