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INTRODUCTION

International studies on Quality of Cancer Care (QoCC) since the 90's showed a constant and continuous improvement of the delivered oncologic care and a consequent spread of the advanced specialist care on the territory. The most of the study were developed on a regional basis as well as our project: this helps to increase the enrolment of the involved physicians and it shares a common basis about the sanitary laws and the territorial characteristics. One of the main challenges in the previous studies was due to the delay from the analysis of the first specimen in pathology and the registration of the incident cases at the cancer registry. The peculiarity of the Ticino Cancer Registry is of being located inside the Cantonal Institute of Pathology, so all the histological verified incident cases are recorded real-time. The aims of the present study are to produce evidence-based quality indicators (QIs), whom application could allow an immediate change in the diagnostic-treatment process, that could be translated in a short-term benefit for patients.

METHODS

The QC₃ project is a population-based, prospective study, implemented on a three-year time period (2011-2013) on the territory of Canton Ticino. It deals with the QoCC of colorectal, prostatic, ovarian, endometrial and lung cancers. From the Ticino Cancer Registry we extract the patients and the cases regarding the above considered pathologies, treated both in the regional public and private hospitals; we include in the study all the patients > 18 years old, that is to say that all the elderly, usually excluded from randomized clinical trials (RCTs), are here evaluated. In the preliminary phase of the project, the QC₃ QIs derived from a comprehensive literature search on PubMed/MEDLINE of relevant peer-reviewed articles are developed using a 2-step modified Delphi process, involving dedicated working groups (WG) of local health care providers (colorectal WG, lung cancer WG, prostate cancer WG, ovarian/endometrial cancers WG, lung WG) to obtain expert opinions in a systematic, anonymous and individual manner for the validation of both evidence- and expert-based items. Then, for each localization, the list of selected cancer-specific QIs derived from the two Delphi rounds is submitted to an independent international multidisciplinary cancer-specific Advisory Board (AB), in order to get an additional evaluation and to define a final approved list of QIs. The final selected QIs are applied to the regional routine oncologic care, so to evaluate the performance of the currently used pattern of care according to the international guidelines.

RESULTS

Here we present a selection of the preliminary QIs results about the colorectal cancer (CRC) cases incident in 2011 (n=243). The initial evidence-based cancer-specific list of QC₃ QIs (n=149) was proposed to the CRC WG in an in-person meeting, for a preliminary revision and their selection (n=104), then it underwent to a 2-step modified Delphi process, shortening the QIs candidates to 89. The AB revised them and extracted the final 74 QIs (Fig.1). In **Tab. 1** we describe the demographic characteristics of the CRC cases incident in 2011 (n=243), whereas **Tab. 2** reports the CRC cases incident in 2011 undergoing surgery. In **Tab. 3** is represented a selection of the final QIs. For each QI is described its own *denominator*, i.e. the population on whom the QI is calculated, the results expressed in YES (QIs satisfied), NO (QIs not satisfied) and MISSING (data not present in the whole medical documentation examined). Furthermore, for each QI is indicated the literature used to define it (G= guidelines; R= reviews; M= meta-analysis; PBS: population-based studies; CCS: case-control or cohort studies).

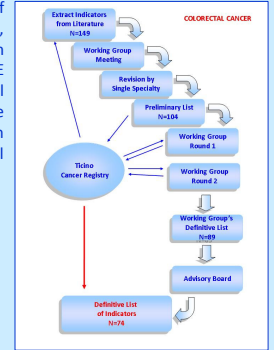


Fig. 1 – QC₃ QIs SELECTION

Tab. 1 – CRCs INCIDENT IN 2011

Variable	Totale n = 243	COLON n = 167 (69%)	RETTO n = 76 (31%)
Sesso, n (%)			
Uomini	129 (53.1%)	84 (50.3%)	46 (60.5%)
Donne	114 (46.9%)	83 (49.7%)	30 (39.5%)
Età			
mediana (anni)	72112	73111	71114
mediana	74	74	74
Gruppi età-specifici, n (%)			
0-49	10 (4.1%)	3 (1.8%)	7 (9.2%)
50-59	25 (10.3%)	15 (9.0%)	10 (13.2%)
60-69	56 (23.0%)	45 (26.9%)	11 (14.5%)
70-79	79 (32.5%)	56 (33.4%)	23 (30.3%)
>80	73 (30.1%)	48 (28.7%)	25 (32.8%)
Gruppi età specifici, n (%)			
<70	91 (37.4%)	63 (37.7%)	28 (36.5%)
≥70	152 (62.6%)	104 (62.3%)	48 (63.2%)
Localizzazione tumorale ICD O II			
18.00 cieca	29 (11.9%)	29 (17.4%)	0
18.20 colon ascendente	33 (13.6%)	33 (19.8%)	0
18.30 flessura epatica	7 (2.9%)	7 (4.2%)	0
18.40 colon trasverso	18 (7.4%)	18 (10.8%)	0
18.50 flessura splenica	10 (4.1%)	10 (6.0%)	0
18.60 colon discendente	16 (6.6%)	16 (9.6%)	0
18.70 sigma	50 (20.6%)	50 (29.8%)	0
18.80 overlapping lesion	2 (0.8%)	2 (1.2%)	0
18.90 colon, NOS	2 (0.8%)	2 (1.2%)	0
20.90 ampolla rettale, NOS	6 (2.5%)	6 (3.6%)	0
20.91 retto distale (<7.5 cm)	28 (11.5%)	28 (16.8%)	0
20.92 retto medio (7.5-12 cm)	7 (2.9%)	7 (4.2%)	0
20.93 retto prossimale (>12 cm)	26 (10.7%)	26 (15.6%)	0
20.94 retto medio-prossim., NOS	3 (1.2%)	3 (1.8%)	0
20.95 retto medio-distale, NOS	6 (2.5%)	6 (3.6%)	0
Histological type			
adenocarcinoma	225 (92.6%)	153 (91.6%)	72 (94.7%)
carcinoma mucinoso	1 (0.4%)	1 (0.6%)	0 (0.0%)
carcinoma sigillo cellulare	15 (6.2%)	11 (6.6%)	4 (5.3%)
carcinoma NOS	2 (0.8%)	2 (1.2%)	0 (0.0%)

Tab. 2 – OPERATED CRCs INCIDENT IN 2011

Variable	Totale n = 200	COLON n = 150 (75%)	RETTO n = 50 (25%)
Sesso, n (%)			
Uomini	108 (54%)	79 (53%)	29 (58%)
Donne	92 (46%)	71 (47%)	21 (42%)
Età			
mediana (anni)	72111	72111	69112
mediana	72	73	72
Gruppi età-specifici, n (%)			
0-49	7 (3.5%)	3 (2%)	4 (8%)
50-59	21 (10.5%)	13 (8.7%)	8 (16%)
60-69	52 (26%)	40 (26.7%)	12 (24%)
70-79	66 (33%)	49 (32.7%)	17 (34%)
>80	54 (27%)	43 (28.6%)	11 (22%)
Gruppi età specifici, n (%)			
<70	80 (40%)	58 (38.7%)	22 (44%)
≥70	120 (60%)	92 (61.3%)	28 (56%)
Tipo istologico			
adenocarcinoma	184 (92%)	137 (91.3%)	47 (94%)
carcinoma mucinoso	13 (6.5%)	10 (6.7%)	3 (6%)
carcinoma sigillo cellulare	2 (1%)	2 (1.3%)	0 (0%)
carcinoma NOS	1 (0.5%)	1 (0.7%)	0 (0%)
Classificazione AJCC			
I	42 (21%)	34 (22.7%)	8 (16%)
IIA	58 (29%)	45 (30%)	13 (26%)
IIB	12 (6%)	10 (6.7%)	2 (4%)
III	3 (1.5%)	2 (1.3%)	1 (2%)
IIIA	6 (3%)	3 (2%)	3 (6%)
IIIB	43 (21.5%)	26 (17.3%)	17 (34%)
IIIC	10 (5%)	9 (6%)	1 (2%)
IV	26 (13%)	21 (14%)	5 (10%)

Tab. 3 – CRCs INCIDENT IN 2011 – QC₃ QIs SELECTION

QUALITY INDICATORS (QI)	DENOMINATORS	RESULTS	LITERATURE
Proportion of patients evaluated by preoperative colonoscopy	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 172 (86%) No: 17 (8.5%) Missing: 11 (5.5%)	CCS, R, G
Proportion of patients with preoperative staging according to the AJCC TNM 7 th ed.	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 126 (63%) No: 8 (4%) Missing: 66 (33%)	G
Proportion of patients undergoing rectal-sigmoidoscopy/colonoscopy	Patients with rectal cancer (n=76)	Yes: 68 (90%) No: 3 (4%) Missing: 5 (6.6%)	P, CCS, R, M
Proportion of patients undergoing biopsy	Patients with rectal cancer (n=76)	Yes: 65 (86%) No: 5 (6.6%) Missing: 6 (7.9%)	P, CCS, R, M
Proportion of patients with description of the clinical-endoscopic visit, particularly of the tumour localization (distance <i>ab ano</i>)	Patients with rectal cancer (n=76)	Yes: 60 (79%) No: 9 (11.8%) Missing: 7 (9.2%)	CCS, R
Proportion of patients with definitive pathological report including the number of lymph nodes retrieved	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 196 (98%) No: 1 (0.5%) Missing: 3 (1.5%)	CCS, R, G, PBS
Proportion of patients with definitive pathological report including the margin status	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 196 (98%) No: 1 (0.5%) Missing: 3 (1.5%)	G
Proportion of patients with definitive pathological report including the pTNM classification	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 193 (96.5%) No: 4 (2%) Missing: 3 (1.5%)	CCS, G
Proportion of patients operated in emergency	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 29 (14.5%) No: 153 (76.5%) Missing: 18 (9%)	CCS
Proportion of patients operated on with free margins	Patients with colorectal cancer undergoing surgery (n=200)	Yes: 8 (4%) No: 188 (94%) Missing: 4 (2%)	CCS, G, M
Proportion of patients NOT undergoing neo-adjuvant RT or RT-CT, with a number of resected lymph nodes ≥ 12	Patients with colon cancer and patients with rectal cancer undergoing primary surgery (n=183)	Yes: 148 (81%) No: 32 (17.5%) Missing: 3 (1.6%)	CCS, R, G, PBS
Proportion of patients with clinical stage from I (T2N0M0) to III (every T, N1-2M0) undergoing an extensive surgical resection with anastomosis	Patients with AJCC stage I (from T2N0M0) - III colorectal cancer (n=173)	Yes: 171 (99%) No: 1 (0.6%) Missing: 1 (0.5%)	G
Proportion of patients with metastases for which the first line of systemic therapy was planned on the basis of molecular factors (KRAS, BRAF, etc)	Patients with colorectal cancer with unresectable metastases undergoing chemotherapy (n=28)	Yes: 12 (43%) No: 15 (53%) Missing: 1 (3.6%)	CCS, R, G
Proportion of patients with single pulmonary metastasis or hepatic metastases undergoing immediate/synchronous metastasectomy	Patients with colorectal cancer with hepatic or singular pulmonary metastases (n=30)	Yes: 2 (6.7%) No: 28 (93.3%) Missing: 0	G
Proportion of patients with protective stoma before neo-adjuvant RT-CT	Patients with rectal cancer undergoing neo-adjuvant radio-chemotherapy (n=20)	Yes: 2 (10%) No: 16 (80%) Missing: 2 (10%)	CCS
Proportion of patients with locally advanced tumours undergoing neo-adjuvant RTCT	Patients with locally advanced rectal cancer (n=24)	Yes: 17 (71%) No: 5 (21%) Missing: 2 (8%)	CCS, R, G

CONCLUSIONS

The study is instrumental to draw a population-based picture of the QoCC currently in use in the territory of Canton Ticino and to open new perspectives on quality-related issues in oncology. In addition, the systematic trend analysis of QI allows to assess immediate changes and improvements in the diagnostic-therapeutic process that could be translated in a short-term benefit for patient, without waiting for survival analysis typically needed some years to be produced because of the patients follow-up. The prospective design allows the production of up-to-date results, reproducing the currently used pattern of care. The population-based design implies the inclusion of the elderly patients usually excluded from RCTs. The study favours the rationalization of data transmission modalities to Cancer Registries and, furthermore, it increases the expectations of Cancer Registry data system, moving from the static retrospective evaluation of cancer treatment outcomes to dynamic interventions to monitor and to ensure optimal multidisciplinary cancer care. Moreover, in a second step, for each QI the *minimum* and the *target requirement* at a regional level will be proposed.