

OVERVIEW OF SURGICAL GASTRIC CANCER TREATMENT ACCORDING TO THE HOSPITAL VOLUME IN CROATIA

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Summary

Gastric is considered neglected cancer in terms of stage at diagnosis and success of treatment worldwide. Early detection and quality of gastric cancer surgery remain the most important for successful treatment in terms of overall survival. In this paper, we focus on the overview of hospitals and volume of gastric cancer in Croatia as a possible baseline for quality assessment and implementation of existing quality guidelines. We accessed publicly available data from the Croatian Insurance Fund for the period between 1st January 2013 to 31st December 2018. For background information on gastric cancer incidence and mortality, we used Croatian Cancer Registry data available online. We obtained both the number of resected gastric cancer in all Croatian hospitals as well as the length of stay. Data analysis discovered that there is a clear volume difference between teaching hospitals and non-teaching hospitals; only the first have sufficient volume for quality audit. This overview stresses one of the most critical points in cancer surgery, volume of surgery as a quality indicator.

KEYWORDS: *gastric cancer, surgery, Croatia, hospital volume*

PREGLED KIRURŠKOG LIJEČENJA RAKA ŽELUCA PREMA BROJU OPERACIJA U POJEDINIM BOLNICAMA U HRVATSKOJ

Sažetak

Rak želuca smatra se zanemarenim tumorom zbog kasne dijagnoze i ishoda liječenja. Rano otkrivanje i kvaliteta operacijskog liječenja najvažniji su za uspješno liječenje i ukupno preživljenje. U radu predstavljamo pregled bolnica i broj operiranih bolesnika s rakom želuca u Hrvatskoj kao moguću osnovu za ocjenu i provedbu postojećih smjernica kvalitete. Korišteni su javno dostupni podaci Hrvatskog zavoda za zdravstveno osiguranje od 1. siječnja 2013. do 31. prosinca 2018. Podatci o učestalosti i smrtnosti od raka želuca su sa internetskih stranica Hrvatskog registra za rak pri Hrvatskom zavodu za javno zdravstvo. Prikazan je broj operiranih od raka želuca i duljina boravka u svim hrvatskim bolnicama. Ustanovljena je jasna razlika u broju operiranih bolesnika s rakom želuca između nastavnih i nenastavnih bolnica. Samo nastavne imaju dovoljan broj za reviziju kvalitete. Broj operacija je najvažnija mjera kvalitete u onkološkoj kirurgiji.

KLJUČNE RIJEČI: *rak želuca, resekcije, Hrvatska, broj operacija*

INTRODUCTION

Gastric is considered neglected cancer in terms of stage at diagnosis and success of treatment worldwide, with Japan and Korea being the exceptions (1). The trend of falling incidence is recorded in developed countries mostly attributed to *Helicobacter pylori* eradication (2).

Unlike most European Union countries, both the incidence and mortality in Croatia are rather stable (3,4). Late diagnosis and poor patient general condition is something we are forced to handle and have addressed in our previous paper on cachexia and preconditioning being quintessential for undergoing possible curative treatment or at least being a candidate for neoadjuvant treatment or palliative resection/bypass (5).

However, early detection and quality of gastric cancer surgery remain most important for successful treatment in terms of overall survival. In this paper, we focus on the overview of hospitals

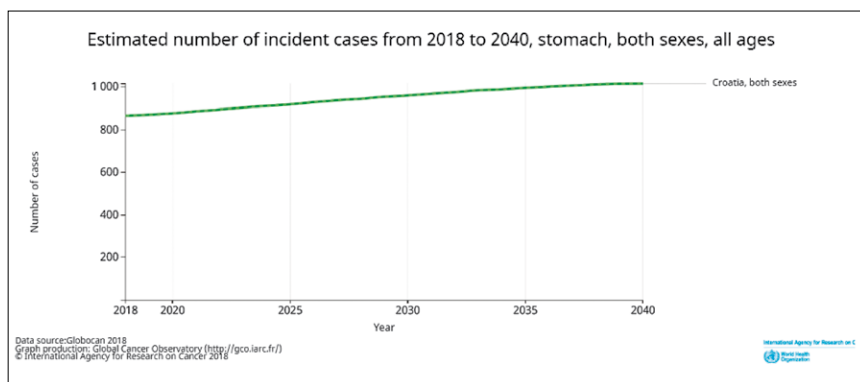
and volume of gastric cancer in Croatia as a possible baseline for quality assessment and implementation of existing quality guidelines.

MATERIALS AND METHODS

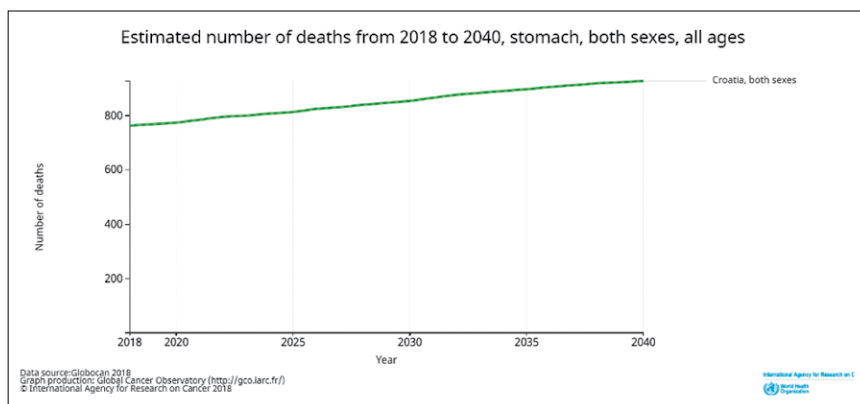
For this overview, we accessed publicly available data from the Croatian Insurance Fund (7) for the period between 1st January 2013 to 31st of December 2018. For background information on gastric cancer incidence and mortality, we used Croatian Cancer Registry data available online (8).

We searched for the number of resected gastric cancer in all Croatian hospitals through DTS system for reimbursement and recorded all subtotal, distal, total and radical gastrectomies for C16 diagnoses and the center they pertained to. We also recorded the length of stay.

Hospitals in Croatia are classified by the number of teaching units with defined equipment



(a)



(b)

Figure 1. Incidence(a) and mortality (b) projection for gastric cancer in Croatia according to Globocan (6).

and personnel which are then financed by State and most non-teaching hospitals that are funded by counties or towns.

RESULTS

In the period between 2013 and 2018, the number of gastrectomies per institution is rather stable. The overall number of surgical resection for gastric cancer fell for about 20% during the period.

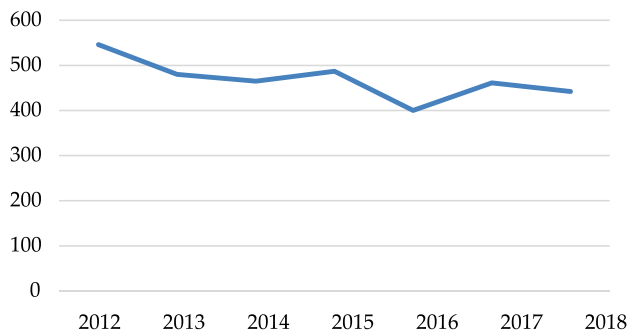


Figure 2. Surgical procedures on stomach, oesophagus and duodenum. Abscissa=years; ordinate=surgical resection

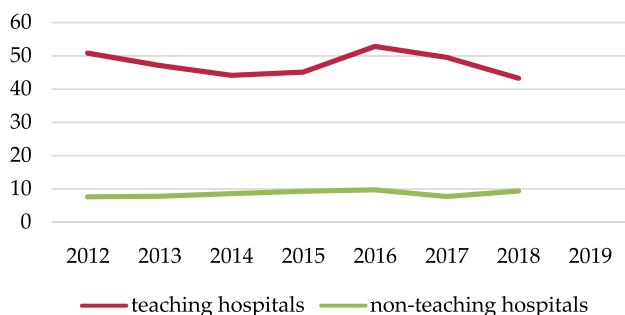


Figure 3. Gastrectomies in teaching hospitals versus non-teaching hospitals. Abscissa=years; ordinate=surgical resection

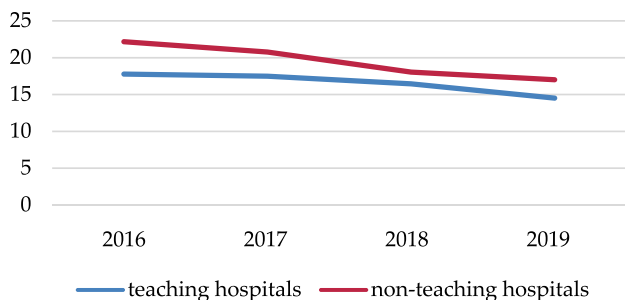


Figure 4. Length of hospital stay (days) in teaching hospitals versus non-teaching hospitals

The non-teaching hospitals number of cases is well below the recommended volume per hospital, while the teaching hospitals have a sufficient number of cases.

The hospital length is on average 10 days longer in local hospitals (Figure 4).

DISCUSSION

Gastric cancer has a stable incidence and mortality in Croatia with about 900 cases annually and overall survival of 20% for five year period (3,9). Data on stage at diagnosis confirms the late stages of onset and limited treatment options. However, over half of the cases get potentially curative surgical treatment.

Based on ESSO guidelines for quality of surgery we wanted to evaluate the landscape of gastric cancer surgery volume in Croatia as one of the basic quality indicators (10,11). There is a clear volume difference between teaching hospitals and non-teaching hospitals, only first have sufficient volume for quality audit.

The length of hospital stay in this overview is on average ten days longer for local hospitals versus teaching hospitals. Longer hospital stay correlates with higher real treatment costs. This is difficult to trace as Croatian Insurance fund reimburses expenses per group of diagnosis.

The bias of this overview is correct reporting of procedures, which we tried to recheck (eliminate) by checking the number of procedures at our institution through our data registries and the adjustment was needed for one year only (*in the Figure 3).

For a precise analysis of treatment and outcomes, it would be ideal to look at clinical pathways, however, we did not have sufficient logistics for that approach. Nevertheless, this overview stresses one of the most important points in cancer surgery volume of surgery as a quality indicator.

REFERENCES

1. Rawla P, Barsouk A. Epidemiology of gastric cancer: Global trends, risk factors and prevention. Vol. 14, Przeglad Gastroenterologiczny. Termedia Publishing House Ltd.; 2019. p. 26-38.
2. Balakrishnan M, George R, Sharma A, Graham DY. Changing Trends in Stomach Cancer Throughout the World. Current Gastroenterology Reports. 2017;19(8): 36. doi: 10.1007/s11894-017-0575-8.

3. Kirac I, Šekerija M, Šimunović I, Zgaga L, Vrdoljak DV, Kovačević D, et al. Incidence and mortality trends of gastric and colorectal cancers in Croatia, 1988-2008. *Croat Med J.* 2012;53(2):124–34.
4. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018 Nov; 68(6):394–424.
5. Kirac I, Fila J, Misir Z, Filipović Čugura J, Žaja A, Benčić I, et al. Nutritional evaluation in the perioperative period of gastric cancer patients using bioelectrical impedance analysis (BIA). *Libr Oncol.* 2019;13–6.
6. International Agency for Research on Cancer. Cancer Tomorrow. World Health Organization. 2019 [accessed on 2019 Dec 22]. p. 1–2. Available from: https://gco.iarc.fr/tomorrow/graphic-line?type=0&population=900&mode=population&sex=0&cancer=39&age_group=value&apc_male=0&apc_female=0
7. Dijagnostičko Terapijske Skupine (DTS) u hrvatskom bolničkom sustavu. [accessed on 2019 Dec 22]. Available from: http://www.cezih.hr/dts_rezultati_i_novosti.html
8. Registar za rak | Hrvatski zavod za javno zdravstvo. [accessed on 2019 Dec 22]. Available from: <https://www.hzjz.hr/tag/registar-za-rak/>
9. Šekerija M, Bubanović L, Novak P, Čukelj P, Lončar J, Štruc K, et al. Registar za rak Republike Hrvatske. 2019;(41). Available from: <https://www.hzjz.hr/sluzba-epidemiologija-prevencija-nezaraznih-bolesti/odjel-za-maligne-bolesti/>
10. Waddell T, Verheij M, Allum W, Cunningham D, Cervantes A, Arnold D. Gastric cancer: ESMO-ESSO-ESTRO clinical practice guidelines for diagnosis, treatment and follow-up. *Eur J Surg Oncol.* 2014 [accessed on 2019 Dec 18];40:584–91. Available from: <http://dx.doi.org/10.1016/j.ejso.2013.09.020>
11. Dikken JL, van Sandick JW, Allum WH, Johansson J, Jensen LS, Putter H, et al. Differences in outcomes of oesophageal and gastric cancer surgery across Europe. *Br J Surg.* 2013 Jan [accessed on 2019 Dec 18];100(1):83–94. Available from: <http://doi.wiley.com/10.1002/bjs.8966>

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