

Prognostic Model for One-year Mortality in Patients with Upper Gastrointestinal Malignancy at Cipto Mangunkusumo Hospital Jakarta, Indonesia

Khaira Utia Yusrie^{1,2}, Dadang Makmun^{1,2}, Andri Sanityoso Sulaiman², Siti Setiati²

1 Division of Gastroenterology, Department of Internal Medicine, Faculty of Medicine University of Indonesia;

2 Cipto Mangunkusumo National General Hospital Jakarta, Indonesia.

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Correspondence to: Khaira Utia Yusrie, Division of Gastroenterology, Department of Internal Medicine, Faculty of Medicine University of Indonesia.

Email: utiyusrie@yahoo.com

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ABSTRACT

AIMS: To identify prognostic factors for one-year mortality in patients with upper gastrointestinal malignancy in Indonesia.

Methods: Retrospective cohort study using the hospital database of patients with upper gastrointestinal malignancy at Cipto Mangunkusumo Hospital (2015-2019). Bivariate and multivariate cox proportional hazards regression analysis were performed to identify independent factors associated with mortality upper gastrointestinal malignancy. Scoring system were developed based on the identified factors.

RESULTS: 184 patients were analyzed, mostly male (58.7%) with average ages 54.5 years old. Independent factors associated with one-year mortality were age > 60 years with HR 1.93 (95%CI 1.30; 2.88), body mass index < 20 with HR 2.04 (95%CI 1.25; 3.33), smoking history with HR 1.77 (95%CI 1.20; 2.61), performance status ECOG

> 2 with HR 3.37 (95%CI 2.11; 5.37), clinical stage which is 4th stage HR 9.42 (95%CI 1.27; 69.98) and 3rd stage HR 9.78 (95%CI 1.31; 72.69), and cellular differentiation grade with HR 2.30 (95%CI 1.48; 3.58). 1-year survival rate was 39,7% with median survival was 9 months. The scoring system for predicting mortality had AUC values of 0,918 respectively.

CONCLUSION: The independent factors associated with one-year mortality were age, body mass index, smoking history, performance status, clinical stage of the tumour, and cellular differentiation grade. 1-year survival rate was 39.7%. The mortality probability prediction scoring system has been developed for upper gastrointestinal malignancy.

Key words: Upper gastrointestinal malignancy; Mortality prognostic; Mortality probability prediction score

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INTRODUCTION

Upper gastrointestinal malignancy especially esophageal and gastric cancer is the sixth and third leading cause of cancer-related deaths worldwide. Its mortality number has gradually decreased because of the increasing capability in diagnostic early stage of the cancer. The decrease of mortality has been profounded in developed countries such as Japan, Korea, European Countries, Ukraine, Columbia and Ecuador^[1]. However, in under developed countries, the mortality rate caused by upper gastrointestinal malignancy especially esophageal and gastric cancer have not yet been profounded. As in the case of Indonesia, the number of survivors of Upper gastrointestinal malignancy especially esophageal, gastric and duodenum has unfortunately not yet been concluded.

As depicted in the study of the longterm surviving probability in China for the period of year 2000 until 2011, it has been concluded

that the number of malignancy for male patient has been relatively stable, however, it has been found a prolific increasing rate for female patients. As supported by the study, there have been four major malignancies types found; they are lungs, gastric, kidney and esophageal cancer. These malignancy types are accounted for 57% of the entire malignancies occurred in China as opposed to around 18% occurred in US^[1]. In Indonesia, A study conducted by Makmun D. et al, has found a changing prevalence trend taking place during two different periods: the period of 2002-2006 and 2007-2011. The study compares the changes of malignancy rate in each different cases during those two periods. The colorectal malignancy case found was about 76.3% during the former period and then decreased during the latter period, and followed by the gastric malignancy case at or around 15.6% and 14.9%, Esophageal cancer case at or around 7.4% and 7.6% respectively, and the last is duodenal cancer case which took a significant increase from 0.7% to 6.1% respectively from the entire cases of the upper gastrointestinal malignancy. Prevalency of esophageal adenocarcinoma case has increased significantly from 36.4% to 69.2%. The average age of the patients experiencing the upper gastrointestinal malignancy has also decreased; from 53.02 ± 13.12 to 50.43 ± 11.93 ($p = 0.031$), and the prevalence rate has markedly improved from 60.9% to 82.4% ($p = 0.018$), however, for the age ≥ 60 , the case has significantly decreased from 34.8% to 13.7% ($p = 0.036$)^[2].

Based on the study in China, it is found that the number of deaths caused by esophageal cancer is about 3.940 of 6.493 cases (or around 60.7%) and caused by gastric cancer patients is around 5.228 of 8.537 cases (or around 61.2%) with surviving median around 2.99 years for esophageal cancer and 2.92 years for gastric cancer. The cohort retrospective study conducted by Charati et al, in Iran during 2006-2013 has found that the median surviving years for gastric cancer is around 19 ± 2.04 months with the surviving rate of the patients during 1st year until 5th year outlined as follows: 64%, 44%, 34%, 24% and 19% respectively^[3].

Detecting the cases in early stage has been a virtue in treatment or conducting prognostic the patients. In the US study, some 67% of patients were detected at Stage III and IV compared to only 10% found at Stage I. Correlation the case with lymph has also given varied surviving rate. The Surveillance, Epidemiology and Results Programs (SEER) has collected data in the period of 1973-2000 research suggesting that there has been a correlation with the amount of lymph involved and also served as independent prognosis factor in overall survival^[4,5].

To date, a fair number of researches have been conducted and these researches have analyzed some factors that contribute to the surviving rate of the patient with gastrointestinal malignancy: i.e.: esophageal cancer, gastric cancer and duodenal cancer. These researches had been conducted with all of data limitation confronting the respective researchers. Tustumi et al has conducted research prognostic factors on esophageal cancer and reported that there has been a correlation with age, gender, weight loss, body mass index, performance status, and tumour stage taken as the influential factors in deterioration of prognosis of the patients^[6]. The study conducted by Samadi et al on patients with esophageal and gastric cancer has suggested that smoking and the degree of tumour differentiation are the primary factors impacting the patient's surviving rate^[7]. Other study conducted by Ji-ang S. et al on Duodenum malignancy has suggested that the patients > 60 years of age with tumour case would lead to higher hazard ratio i.e. age between 59-75 would result in 1.59 (95%CI 1.2-2.1) with $p = 0.001$. While those older than 75 would result in 2.74 (95%CI 2.0-3.7) with $p < 0.001$ ^[8]. Maezawa et al also conducted their cohort ret-

rospective research during the year of 2000 until 2015 and concluded that comorbidity with the highest CCI scoring is the independent risk factor on deterioration prognosis with gastric cancer^[9].

Based on the research on relevant literatures, we have not yet concurred a study that supposedly combines the entire prognostic factors leading to mortality on patients with upper gastrointestinal malignancy. Furthermore, there has not yet been available to us a scoring system that could be applied to assess mortality prognostic on the patients with gastrointestinal malignancy so that it enables the clinics to evaluate and to conduct the proper intervention required.

METHODS

The prognostic study with cohort retrospective design has been conducted which based on the medical record provided by Cipto Mangunkusumo Hospital Jakarta during the period of August-December 2020. The patients as samples being minimum 18 years of age with gastrointestinal malignancy case including esophageal, gastric and duodenal cancer that had been recorded for the period of 2015-2019.

Sampling methodology is conducted by tracing and evaluating medical records of the patients of Cipto Mangunkusumo Hospital. The method applied is total sampling with consecutive basis so that it would suffice to attain minimum data sample calculation. The collected data encompass the characteristics of research study including age, gender, smoking history, type of malignancy as evidenced by supportive tools (i.e. histopathology, radiology figures and endoscopy results), accompanying illness for comorbid, nutrient status with body mass index, history of loss weight, and stage tumour. In the event that patient last state / condition is not traceable or not conclusive because of the lost of follow-up, therefore, the last treatment date in the medical record is utilized as a proxy the liveliness of the patient and this would be applied in the "Censor" and accounted for in the surviving rate calculation.

The entire data collected would be recorded in the table and loaded in the Microsoft Excel software, and processed further by utilizing a program "Stata 15" in the computer. Basic characteristics and clinic of the research subject would be presented in a table.

Each predictor variable would be analyzed with bivariate and multivariate methods with statistical test Cox Proportional Hazards Regression Model. In bivariate analysis, each predictor would become covariant to the mortality in 1 year, so that Hazard Ratio (HR) could be calculated along with each respective p value. Predictor factor with p value < 0.25 would be added in the multivariate analysis by applying Cox Regression Model technique simultaneously so that Hazard Ratio could be retrieved as well as the p value for each predictor, where the value would be decided as significant (meaningful) to the occurrence of mortality if and only if the $p < 0.05$. The significance of the variables are the independent factor to the mortality of the patients with gastrointestinal malignancy.

In attaining the prediction of mortality of the patients with gastrointestinal malignancy, this research would be developed with scoring system from multivariate analysis. The entire variables with $p < 0.05$ would be analysed and subsequently included in the Scoring system stage. The score is developed by combining coefficient value (B) from the variables produced by Cox Regression Model, then evaluating the lowest score, followed by calculating score. In deciding the crossing value from logistic scoring to assess mortality prediction, the curve of Receiver Operating Characteristics (ROC) would be analyzed so as to gain the sensitivity values and specificities concern-

ing to the performing predictor model. Performing score would be evaluated by the Area Under Curve (AUC). The ROC value is deemed as acceptable if it results $AUC > 0.8$.

To evaluate the capability of generalisation from this prognostic model, internal validation would be applied to the existing data.

Mortality data would also be undergone surviving analysis through Kaplan-Meier Curve to achieve the cumulated surviving and the entire surviving of the subject for 1 year of the observed period., as well as surviving of the subject for each related variable. To attest statistical significance, it is decided if each of the variable results in $p < 0.05$ hence categorized as significant.

This research has been recognized and passed the ethical conduct test as issued by The Committee of the Ethics Medical Research of Medical Faculty of University of Indonesia., as evidenced with reference letter numbered: KET-1402/ UN2.F1/ETIK/ PPM.00.02/2020.

Table 1 Characteristics of the data.

Variable	Measurement	(n = 184)
Age	> 60 yo	64 (34.8%)
	< 60 yo	120 (65.2%)
Sex	Male	108 (58.7%)
	Female	76 (41.3%)
BMI	< 20	104 (56.5%)
	> 20	80 (43.5%)
Performance status	ECOG > 2	71 (38.6%)
	ECOG < 2	113 (61.4%)
Weight loss	> 5 kg	110 (59.8%)
	< 5 kg	74 (40.2%)
Smoking	Smoking	80 (43.5%)
	Not smoking	104 (56.5%)
Tumour stage	Stage 4	88 (47.8%)
	Stage 3	72 (39.1%)
	Stage 0-2	24 (13.0%)
Grading	Poorly and undifferentiated	95 (51.6%)
	Well and moderately differentiated	89 (48.4%)
Comorbid	CCI score > 4	73 (39.7%)
	CCI score <4	111 (60.3%)
Location	Duodenal	31 (16.8%)
	Gaster	84 (45.7%)
	Esophagus	69 (37.5%)

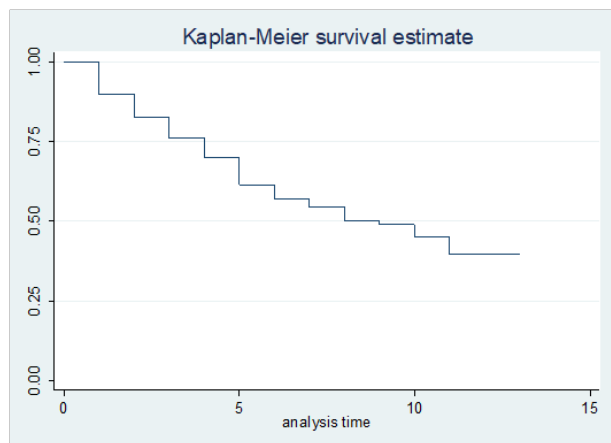


Figure 1 One-year survival Kaplan-Meier Curve.

RESULTS

For the observation period of January 2015 until December 2019, there had been 184 patients were analysed in this research. 108 of whom were male (58.75%) and 76 remaining were female (41.3%). The average age of female was 54.5 years of age. The largest proportion of gastrointestinal malignancy was found to be gastric cases with 84 cases (45.7%) and followed by esophageal cancer with 69 cases (37.5%), and finally, duodenal cancer with 31 cases (16.8%) as depicted in table 1. The proportion of gastrointestinal malignancy

Table 2 The result of bivariate analysis of prognostic factors related with mortality of patients with upper gastrointestinal malignancy

Variable	Measurement	n	Event	HR	min CI	max CI	p-value
Age	> 60 yo	64	47	1.65	1.13	2.41	0.009
	< 60 yo	120	64				
Sex	Male	108	67	1.12	0.76	1.64	0.565
	Female	76	44				
BMI	< 20	104	79	3.34	2.2	5.06	<0.001
	> 20	80	32				
Performance status	ECOG > 2	71	66	6.72	4.51	10.03	<0.001
	ECOG < 2	113	45				
Weight loss	> 5 kg	110	82	3.32	2.16	5.09	<0.001
	< 5 kg	74	29				
Smoking	Smoking	80	59	1.8	1.24	2.61	0.002
	Not smoking	104	52				
Tumour stage	Stage 4	88	67	32.04	4.44	231.09	0.001
	Stage 3	72	43				
	Stage 0-2	24	1				
Grading	Poorly and undifferentiated	95	80	4.03	2.65	6.14	<0.001
	Well and moderately differentiated	89	31				
Comorbid	CCI score > 4	73	59	2.69	1.84	3.92	<0.001
	CCI score <4	111	52				
Location	Duodenal	31	16	0.8	0.54	1.2	0.285
	Gaster	84	49				
	Esophagus	69	46				

ROC Curve

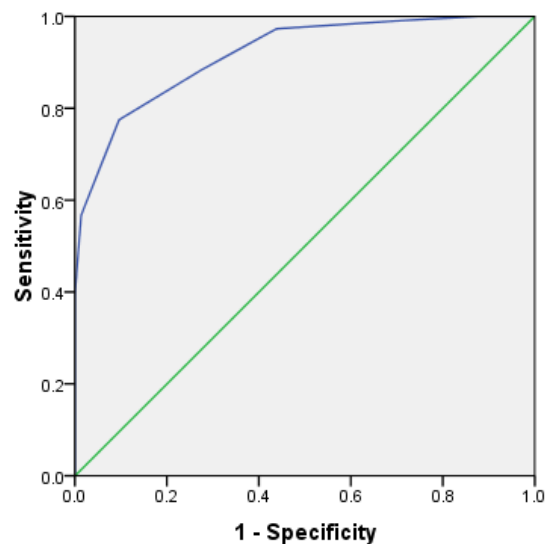


Figure 2 ROC Curve.

accounts for 60,3% with the surviving median rate is around 9 months (Figure 1).

Bivariate and Multivariate Analysis

In order to ascertain the prognostic factors that are impacted to the mortality of the patients with gastrointestinal malignancy, bivariate and multivariate analysis were applied.

The assessment as guided under the proportional hazard assumption is carried out to attest whether each predictive variable would conform or fulfil to the requirement of Cox’s assumption before further analysis of bivariate and multivariate taking place.

In bivariate analysis with the following characteristics: age ($p = 0.009$), body mass index ($p < 0.001$), weight loss ($p < 0.001$), smoking ($p = 0.002$), tumour stage ($p = 0.001$), the grade of cellular differentiation ($p < 0.001$), comorbidity ($p < 0.001$), these are the prognostic factors that correlate with the death caused by upper gastrointestinal malignancy. There had not yet been found a significant correlation between gender and location of the tumour carried by the patients with the mortality prognostic of upper gastrointestinal malignancy (Table 2).

Table 3 Multivariate analysis.

Variable	HR (95%CI)	p-value
Age	1.93 (1.30-2.88)	0.001
BMI	2.04 (1.25-3.33)	0.004
Smoking	1.77 (1.20-2.61)	0.004
Performance status	3.37 (2.11-5.37))	<0.001
Stage 4	9.42 (1.27-69.98)	0.028
Stage 3	9.78 (1.31-72.69)	0.026
Grading	2.30 (1.48-3.58)	<0.001

Table 4 Scoring System.

Variable	B	S.E	Step 1	Step 2	Step 3
			B/S.E	(B/S.E)/2.25	Simplification
Age (>60 yo)	0.66	0.2	3.25	1.49	1
BMI (<20)	0.71	0.25	2.84	1.3	1
Smoking	0.57	0.2	2.88	1.32	1
Performance status (>2)	1.21	0.24	5.1	2.33	2
Stage 4	2.24	1.02	2.19	1	1
Stage 3	2.28	1.02	2.23	1.02	1
Grading (poorly and undifferentiated)	0.83	0.22	3.71	1.69	2

Table 5 Variable Scoring.

Variable	Category	Score
Age	> 60 yo	1
	< 60 yo	0
Body Mass Index	< 20	1
	> 20	0
Smoking	Yes	1
	No	0
Performance status	ECOG > 2	2
	ECOG < 2	0
Stage	Stage 3-4	1
	Stage 0-2	0
Cellular differentiation	Poorly and undifferentiated	2
	Well and moderately differentiated	0

Based on the result of multivariate analysis as the final model of prognostic independent factors. The patients with upper gastrointestinal malignancy would be depicted in table 3.

Scoring System in Mortality prediction with upper gastrointestinal malignancy

This study has developed a scoring system for assessment the prognostic mortality of the patients with upper gastrointestinal malignancy. The entire variables in this analysis in p value < 0.05 to be eligible for the next step that is the scoring system development. The scoring system is developed by calculating the coefficient B and standard error (SE). Table 4 belows has shown the related steps in developing scoring system.

The entire related steps taken have provided scores for each respective variable as depicted in table 5, where the score of 10 being the maximum limit and ROC curve is applied to evaluate the scoring system shown in figure 2. The figure 2 shows the Area Under Curve (AUC) of 0.918 (95%CI 0.88-0.96) with intersection point ≥ 4 (Sensitivity 0.88; Specificity 0.73).

Based on the evaluation of scoring system on predicting factors for patients survival with upper gastrointestinal malignancy, the validity of the predicting survival factors on patients with gastrointestinal malignancy has been found to be acceptable as evidenced in AUC score of 0.918 (95%CI 0.88-0.96).

The scoring system had been developed and had been evaluated on its internal validity by going through 10 times validation check on 20% of the subjects of the research, selected randomly. On each validation test, the AUC values had been retrieved which fall around >0.8 with $p < 0.001$.

Development of the mortality prediction model with scoring system

The mortality prediction model had been developed with a scoring system so as to enable to calculate predicted probability of patient mortality during a certain period, the model applied is as follows: $1 - S_0(t)^{\exp(y)}$ with $S_0(t)$ = baseline survival in certain t and $y = 0,55 \times \text{total score}$. The application of the prediction of mortality probability in a certain period is described in table 6.

DISCUSSION

This research essentially involves the cohort retrospective study on 184 patients with upper gastrointestinal malignancy at Cipto Mangunkusumo Hospital. The subject of the study comprises male (58.7%) being the majority sample, age < 60 years (62.5%) with median age stood at or around 54.5 years of age. This study reveals the general figure of the patients who experience upper gastrointestinal malignancy where the majority cases fall into Gastric cancer (45.7%) which is coincidentally similar with that of China. The China’s study found that 53.7% esophageal cancer occurred in male whereas 77.8% cases fell into gastric cancer^[1,7]. However, in the Iran’s study, the result is different with that of Indonesia where majority cases of upper gastrointestinal malignancy experienced by patients’ age < 60 years, on the other side, Iran’s study shows different cases where upper gastrointestinal malignancy experienced by patients’ age > 60 years accounting for around 68.8% with esophageal cancer cases and for around 73.3% with gastric cancer cases. Other characteristic shows similarity between Indonesia and Iran studies i.e. upper gastrointestinal malignancy experienced by Indonesia’s patients who do not smoke accounted for a relatively higher at or around 56.5%, this result is relatively similar with Iran’s

Table 6 Prediction of mortality probability in a certain period.

	Month	Mortality prediction										
		1st month	2nd month	3rd month	4th month	5th month	6th month	7th month	8th month	9th month	10th month	11th month
Baseline survival		0.954	0.913	0.863	0.802	0.688	0.625	0.583	0.51	0.491	0.422	0.321
Score	0	0	5.20%	9.80%	14.90%	20.90%	31.70%	37.60%	41.60%	48.30%	50.10%	56.20%
	1	1	9.30%	16.90%	25.40%	34.60%	49.80%	57.40%	62.20%	69.70%	71.50%	77.60%
	2	2	16.20%	28.60%	41.20%	53.70%	71.20%	78.70%	82.80%	88.50%	89.70%	93.30%
	3	3	27.30%	45.60%	61.70%	75.20%	89.50%	93.90%	95.80%	98.00%	98.40%	99.20%
	4	4	43.80%	66.80%	82.40%	91.90%	98.30%	99.40%	99.70%	99.90%	99.90%	99.90%
	5	5	64.80%	86.40%	95.70%	98.90%	99.90%	99.90%	100%	100%	100%	100%
	6	6	84.90%	97.30%	99.60%	99.90%	100%	100%	100%	100%	100%	100%
	7	7	96.70%	99.80%	100%	100%	100%	100%	100%	100%	100%	100%
	8	8	99.80%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Probability formula : $1-S_0(t)^{(exp(y))} y = 0.550$

case which falls around 56.5% for esophageal cancer and around 64.5% of gastric cancer^[7].

This study finds that the frequency of tumour location for the patients with upper gastrointestinal malignancy occurred in the patients with gastric cancer case is the highest - which stood around 45.7%- among other malignancies types. This case is similar with that of Iran where gastric cancer occurrence stood at 66,4% compared to esophageal cancer at around 34.6%^[7].

CONTRIBUTING MORTALITY FACTORS IN UPPER GASTROINTESTINAL MALIGNANCY

This study also finds that a number of factors including age, body mass index, smoking, performance status, and cellular differentiation grade is considered to be the factors that independently contribute to the mortality of the patients with upper gastrointestinal malignancy. This study also suggest that patient with age ≥ 60 years is exposed to a higher probability (likelihood) at or around 1.93 times than those < 60 years of age. This finding also concurs with other study by Guzman et al, with HR 2.9 times (95%CI 1.3-6.8) and furthermore, it is also concurred with study by Maezawa et al where the HR stood at or around 4.46 (95%CI 1.07-2.95), as is the case with the study by Jiang S. et al for the study period of 2004-2014 resulting HR value around 1.59 (CI 95% 1.2-2.1) found in the patients age bracket 59-75 years and HR 2.741 (95%CI 2.0-3.7)^[9,10,11].

Body mass index contributes to HR value of 2.04 (95%CI 1.25-3.33) as prognostic mortality for the patients with upper gastrointestinal malignancy. This HR value is a little higher than that of Maezawa et al study where their HR finding stood around 1.61 (95%CI 1.41-2.26) for gastric cancer, BMI value from this study also a little lower than that of Tustumi et al study for the patients with adenocarsiom esophagus whose HR value stood at or around 4,42 (95%CI 1.09;1.79)^[6,9].

Smoking contributes to HR value at 1.77(95%CI 1.21-2.67) concluded from the subject study for the likelihood of mortality caused by upper gastrointestinal malignancy. The number does not markedly differ with that of Samadi et al study where the HR value was around 1,8 (95%CI 1.023-3.23) and that of Smyth et al with HR value of 1.48^[7,12].

Performance status contributes to HR value around 3.37 with 95%CI 2.11-5.37 where in this factor, the patients with ECOG ≥ 2 are exposed to a higher degree around 3.37 times higher for mortality to occur. This HR value is relatively lower than that of Maezawa et al study whose HR value stood at around 1.51 (95%CI 1.23-1.86)^[9].

Tumour stage also contributes to a higher HR value, where in the patients with Stage 3 results in HR value 9.78 (95%CI 1.31-72.69), those with stage 4 would result HR at 9.42 (95% 1.27-69.98). These numbers are relatively higher than those of Jian et al study where the HR value received at or around 3.69 (95%CI 2.0-6.7) for those paients with stage 3 and HR 6.48 (95%CI 2.0-6.7) for those with stage 4^[11].

The grade of tumour differentiation contributes to HR value of 2.30 (95%CI 1.48-3.58) for the probability of mortality occurance caused by upper gastrointestinal malignancy. This number does not markedly differ with that of Tustumi et al study whose HR value stood around 2.0 (95%CI 1.1-3.65) related to the case of esophageal cancer^[6].

This research also describes a general relationship between late intervention and the hazard ratio that may occur in order to improve the scoring performance of the patients so that mortality rate would eventually decrease. The study of Faber J. et al on the patients with esophageal cancer and esophagogastric junction suggests that nutrient intervention may improve weights, performance status and PGE₂ level of the patients with esophageal cancer before undergoing Chemotherapy^[13].

This research has also found that majority of the patients were found to already be at last stage which accounts for around 47.8% with stage 4 and 39.1% with stage 3, so that a number of proper interventions had been carefully evaluated to prolong the patients life expectancy or surviving rate. The analysis study conducted by Ge XY et al proposes that based on SEER data analysis, the patients with gaster cáncer at Stage 4 who had undergone intervention and chemotherapy had a better surviving rate compared to have been left untreated. Their analysis suggests that the surviving rate of the patients undergone intervention had lived longer for about 16 months as compared to 4 months for those who had not, where the entire factors of the patients prognostics had been taken into consideration. Other study suggests that the surviving rate is correlated with the nutrient status, age and existing cormobid^[14,15].

The study conducted by Silvers MA et al proposes that nutritional intervention before conducting invervention therapy would result in lower mortality for the patients with upper gastrointestinal malignancy, although the sample taken in this study is relatively small; around 21 patients taken randomly, so that it is imperative to conduct a study with rather larger samples to realize significant meaning the importance of the study^[6].

The scoring system that we had developed does also require certain cautions to be exercised especially in interpreting the result or outcome produced by the scoring system. The inherent limitation are

relatively contributed by the characteristic of the sample patients who were mostly categorized as advance stage, therefore, it is imperative to conduct further research on the patients with varied stage.

One-year survival

In this study, surviving rate during 1 year period for the patients with upper gastrointestinal malignancy results in around 39.7%, with mortality rate of 60.3%. The mortality rate is similar with that of Hua Z et al study in December 2015, in which the mortality of esophageal cancer stood at 60.7% and of gastric cancer 61.2%^[1]. The Hua findings are relatively higher than those of Samadi et al in their 2007's study, which finds the surviving rate during 1 year is around 40.5% and surviving during 2 years is around 16.9%, nevertheless, median surviving rate is not markedly different for 9 months from Samadi et al compared to 7 months from the other study in Pakistan^[7]. Decreasing mortality number has been more evident in developed countries which has better early detection system as the case in Japan, Korea and European countries. One study concludes that the decreasing rate of mortality in a number of countries have mostly correlated with the much earlier detection and better health management for those cases in earlier stage and by applying new techniques.

Scoring system of predicting mortality in upper gastrointestinal malignancy

As high as 60.3% mortality proportion has been received from this research, therefore, it is important to conduct an evaluation that could differentiate between the patients with higher risk and those with lower risk during the illness of the patient. By doing so, the risks could be assessed and some proper intervention actions could be taken for the patients with upper gastrointestinal malignancy. This study has also been able to identify prognostic factors for patients with upper gastrointestinal malignancy and eventually utilized as a base to develop a scoring system that could predict mortality in certain period of time. Scoring system developed in this study applies a number of clinical variables that had been designed to be inputted by the clinics with ease. Such variables include age, body mass index, smoking record, performance status with related ECOG score, tumour stage, and the cellular differentiation grade. The scoring system resulted from this study shows rather better performance whose Area Under Curve (AUC) result is around 0.918 (95%CI 0.88-0.96).

To our best knowledge, this study presents latest data about mortality and mortality prognostic model for the patients with upper gastrointestinal malignancy in Indonesia and a number of variables have also been included in this study which are relatively easy to be evaluated by the medics in secondary level as well as tertiary level. The data of the variables in evaluation would easily be received and considered as objective so that the application in different or varied clinical condition can be executed. The development of prognostic model with scoring system in this research could also help the clinics in predicting mortality risk of the patients with upper gastrointestinal malignancy.

This research has been of cohort retrospective research and has been based upon the relevant medical record available, therefore, certain miss-information or bias may occur. The subject of the research largely involve with patients with advance stage, so that it is imperative to exercise proper and correct evaluation in relation to postpone or extend the medical intervention required on a patient to improve prognosis of the patient. The scoring performance developed in this study does not include some specific variable which is important in evaluating or assessing the prognostic mortality factor for patient

with upper gastrointestinal malignancy. The reasoning is that some specific markers had not yet been exercised in regular basis on the patient with upper gastrointestinal malignancy. We also suggest that external validation shall be exercised before the mortality scoring system of upper gastrointestinal malignancy would be applied in the clinic.

SUMMARY

Age, body mass index, smoking, performance status, tumour stage, and cellular differentiation grade are the contributing factors to mortality of the patient with upper gastrointestinal malignancy during first year at Cipto Mangunkusumo Hospital. The surviving rate in first 1 year for the patient with upper gastrointestinal malignancy in Cipto Mangunkusumo Hospital has stood at or around 39.7% with surviving median of 9 months. The scoring system could be developed for the patient with upper gastrointestinal malignancy based on the result of better AUC's score and it had undergone internal validation. It is imperative to initiate external validation upon this prognostic mortality scoring system, since this study was developed with prospective design.

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