Research Paper

Evaluation of validity of Edinburgh Dysphagia score in predicting oesophageal cancer in patients with dysphagia

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ABSTRACT: - **Background:** The Edinburgh dysphagia score was developed at the University of Edinburgh in 2010 to predict carcinoma oesophagus in patients presenting with symptoms of dysphagia. We designed a prospective observational study at our institution to validate this scoring system at our institution.
Materials and Methods: 341 patients who presented with dysphagia and underwent esophagogastroduodenoscopy were included in the study conducted for a period of two and half years at Kasturba Hospital. Observations were made with regards to the components of the scoring system and Edinburgh dysphagia score was calculated for all patients.
Observations and Results: The Edinburgh dysphagia score had a sensitivity of 89.20% in detecting patients with carcinoma oesophagus. Specificity of Edinburgh dysphagia score was 70.30% and the positive predictive value was 76.21%.The negative predictive value was 85.92%.
Conclusion: The sensitivity of Edinburgh dysphagia score being low cannot be used to definitely rule out cancer in patients stratified as being at low risk, and hence patients at low risk also need to be thoroughly evaluated to rule out malignancy. However we are of the opinion that more studies may be required to study the validity of the score in different populations

Keywords: - *dysphagia score, carcinoma, oesophagus* ***Abbreviations:*** *EDS – Edinburgh Dysphagia Score*

I.   INTRODUCTION

Dysphagia is a common symptom among patients presenting to surgical clinic. The causes for dysphagia vary from benign causes like gastro esophageal reflux disease to sinisterly etiology like carcinoma of the esophagus. Suspecting carcinoma in a patient presenting with dysphagia results in early evaluation with endoscopic studies and initiation of timely treatment.

Edinburgh dysphagia score was first described by Rhatigan et al [1]. In this study the authors claimed that application of EDS effectively predicts carcinoma of the esophagus in a patient presenting with dysphagia. Edinburgh dysphagia score is a scoring system developed to predict carcinoma esophagus in patients presenting with the symptom of dysphagia .Six parameters are used to calculate the score. The parameters are age, sex, loss of weight, duration of dysphagia, localization of dysphagia and acid reflux. The score stratifies the patients with dysphagia into high risk and low risk for carcinoma esophagus .The allocation of points in the scoring system is as shown in Table 1. A patient with a score of < 3.5 is considered to be at low risk for carcinoma esophagus and a patient with a score of ≥ 3.5 is considered to be at high risk for Carcinomaoesophagus.

Age group	0-39	0
	40-49	4
	50-59	5
	60-69	6
	70-79	7
	80-89	8
	90-99	9
+ Weight Loss of > 3 kg	(present=1,absent=0)	(0 or 1) X 2
+ Duration of symptoms	(> 6 months =1 < 6 months = 0)	(0 or 1) X -1.5
+ Sex	(male = 0 , female=1)	(0 or 1) X -1

+ Localization of Dysphagia	(neck=0,chest = 1)	(0 or 1) X -2
+ Acid reflux	(present=1,absent=0)	(0 or 1) X-1

Table 1: Edinburgh dysphagia score. The last column in the above table represents point.

EDS ≥ 3.5 represents high risk for carcinoma oesophagus

EDS < 3.5 represents low risk for carcinoma esophagus

In this article we have evaluated the effectiveness of EDS in predicting esophageal cancer among patients presenting with dysphagia.

II.   METHODS

This is a prospective, observational study done at Kasturba Medical College Hospital, Manipal from December 15 2011 to May 15 2013. Patients presenting with dysphagia to the department of surgery, Kasturba Medical college Hospital, were the target population of the study.

Edinburgh dysphagia score was calculated for all patients included in the study and association to final diagnosis was established.

Clearance was taken from the institutional Ethical committee prior to starting the study. Statistical analyses were done using SPSS version 16.0.

Inclusion criteria: Patients who present to the Department of Surgery with symptom of dysphagia and undergo esophagogastroduodenoscopy at Kasturba Medical College Hospital, Manipal are included in the study.

Exclusion criteria: Patients previously diagnosed as carcinoma esophagus, patients who did not undergo endoscopy and post-operative patients were excluded from the study.

III.   RESULTS

During the study period a total of 368 patients presented to the Department of Surgery, Kasturba Hospital with dysphagia and were evaluated for the same with esophagogastroduodenoscopy. Out of the 368 patients with dysphagia 341 were included in the study and 27 patients were excluded from the study. In the study group of 341 patients 155 (45.45%) were females and 186 (54.55%) were males with a Male to female ratio of 1.2:1.

The age of the patients in the study ranged from 18 years to 87 years with a mean of 56.37 years.

157 (45.75%) patients reported a weight loss of more than 3 kg and 184 (54.25%) patients reported no weight loss.

The duration of dysphagia was more than 6 months in 70 (20.53%) patients and 271 (79.47%) patients had dysphagia for duration of less than 6 months. The duration of dysphagia ranged from as short as 10 days to as long as 30 years.

The number of patients who localized dysphagia in the neck was 132 (38.71%) and the number of patients who localized it to chest was 209 (61.29%). History of acid reflux was present in 123 (36.07%) patients and absent in 218 (63.93%).

Edinburgh dysphagia score was calculated for the 341 patients included in the study according to formula (Table 1). 135 (39.59%) patients had Edinburgh dysphagia score of <3.5 and were stratified as low risk for esophageal cancer. 206 (60.41%) patients had an Edinburgh dysphagia score of > 3.5% and were stratified as high risk for esophageal cancer.

All the 341 patients underwent esophagogastroduodenoscopy. Biopsy was taken when required.Endoscopy was reported as normal in 85 patients. 176 (51.61%) patients had malignancy which included carcinoma of the pharynx, esophagus and stomach.165 patients had no cancer. Out of these 165 patients 85 patients had no pathology detected on endoscopy. The remaining 80 patients had benign conditions like gastro esophageal reflux disease, esophageal candidiasis, achalasia, post cricoid web and Shatzki's ring.The final result was classified as "cancer" or "no cancer". 176 (51.61%) patients were finally reported to have "cancer". 165 (48.39%) were reported as "no cancer".

Endoscopy and Histopathology reports were correlated with the risk stratification. 206 patients were stratified as high risk for carcinoma esophagus out of which 157 (76.2%) patients had cancer and 49 (23.8%) had no cancer. Out of 135 patients stratified as low risk for carcinoma esophagus, 19 (14.31%) had cancer and 116 (85.9%) patients had no cancer. 176 patients were finally reported to have cancer, out of which 157 (89.2%) patients were stratified as high risk and 19 (10.8%) patients were stratified as low risk.

Out of the 165 patients who had no cancer in the final report, 116 (70.3%) patients were stratified as low risk and 49 (29.7%) patients were stratified as high risk.

From the above data it was found that 5.6% of patients of the study group were wrongly stratified as low risk according to the EDS in spite of having cancer. This group represents the false negative results given

by the Edinburgh Dysphagia score in this study. There were 157 true positive cases, 19 true negative cases and 49 false positive cases in the study
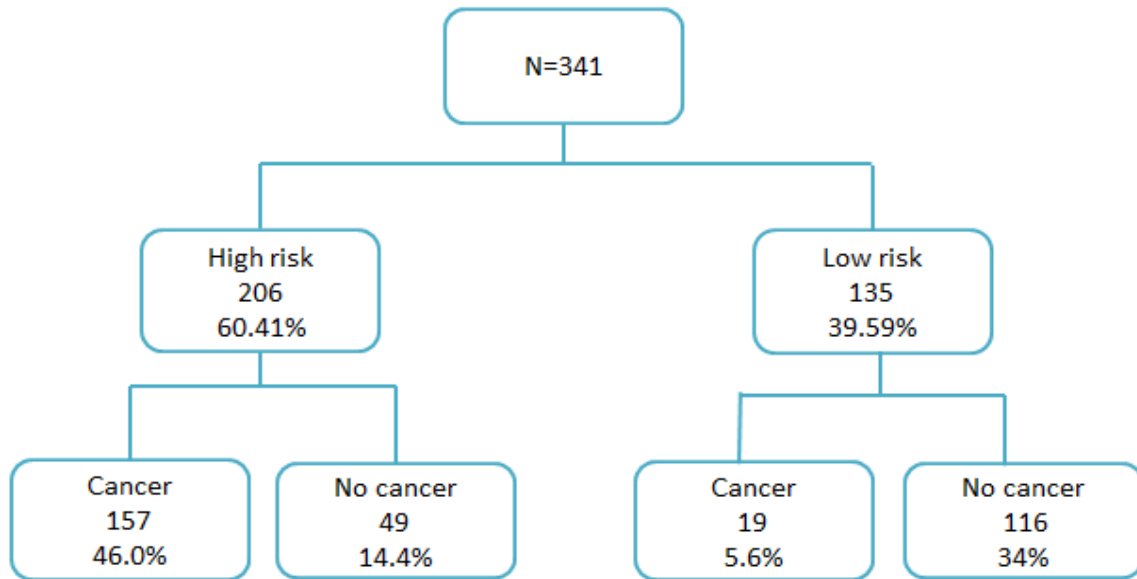
Fig 1: flow chart showing risk stratification according to EDS and cancer detection by OGD

	Cancer	No Cancer	Total
EDS > 3.5 High risk	157	49	206
EDS < 3.5 Low risk	19	116	135
Total	176	165	341

Table 2: Table showing cancer detection in risk groups as stratified by EDS

The Edinburgh Dysphagia score had a sensitivity of 89.20% in detecting patients with carcinoma oesophagus. Specificity of Edinburgh score was 70.30%.
The positive predictive value of Edinburgh Dysphagia score was 76.21%.
The negative predictive value of the Edinburgh Dysphagia score was 85.92%.
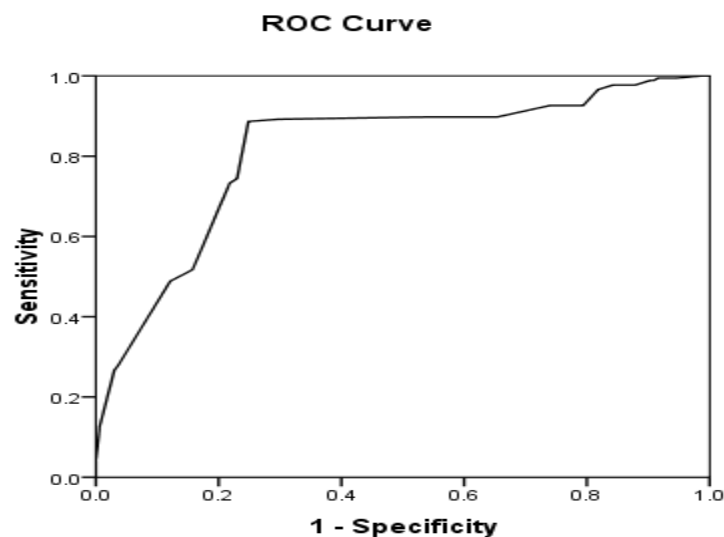
Fig 2: Area under Receiver operating characteristic (ROC) curve of EDS = 0.890

IV. DISCUSSION

Commonest presenting symptom of an esophageal cancer is dysphagia which implies that all patients presenting with dysphagia especially of recent onset need to be evaluated thoroughly to look for presence of cancer. Having known the above, the significance of endoscopy needs to be stressed upon and it should be a mandatory investigation in all patients presenting with dysphagia, however due to limited resources all patients may not be able to undergo endoscopy for diagnosis. Various studies have been design to identify the predictive factors for malignancy to help early diagnosis.

A study done by Kapoor N et al [2] developed a model predictive of malignancy. It was found than dysphagia, weight loss and age over 55 years were all positive predictors of malignancy. This led to the proposal that a patient with either dysphagia, weight loss or more than 55 years of age with dyspepsia and other alarm features should be investigated urgently. The incidence of cancer was greater in this new 'high-risk cohort', and by applying this model the investigators were able to reduce urgent referrals by 30 per cent.

A study was done in Kentucky, USA by Varadarajulu S et al [3] in which the team performed univariable and multivariable logistic regression analyses to evaluate any relation between endoscopic findings and presenting clinical features. The study, involving 1649 patients and 70 cancers, mainly concerned the ability of endoscopy to detect major pathology (including cancer), and was undertaken as an analysis of an endoscopy database without access to patient histories. It also showed that that male sex, weight loss and age over 40 years were all positive predictors of malignancy.

Attempts have been made to stratify the signs and symptoms in patients with dysphagia which were associated with oesophagealcancer,a 12-month audit of dysphagia referrals to a district general hospital attempted to find signs and symptoms present in patients with dysphagia that were significantly statistically associated with oesophagealcancer. The authors reported a positive association between oesophageal malignancy and weight loss and negative associations with heartburn and dysphagia of long duration The American study [4] concluded that esophagogastroduodenoscopy is an effective and an appropriate tool for the initial evaluation of patients presenting with dysphagia. Early esophagogastroduodenoscopy should be considered, particularly, in male patients aged more than 40 years old who concomitantly report heartburn, odynophagia, or weight loss.

Rhatigan et al felt that Identification of a patient cohort at high risk of developing oesophageal cancer mightenable a greater proportion of patients with curable disease stages to be identified and permit better use of investigative resources and hence considering the above factors developed the Edinburgh Dysphagia score and subsequently validated it .It was found to have 98.5% sensitivity in detecting oesophageal cancer in patients with dysphagia.

We made an attempt to validate the score in our population in our study in patients who were finally reported to have cancer, 89.2% patients were stratified as high risk and 10.8% patients were stratified as low risk. Out of the patients who had no cancer in the final report, 70.3% patients were stratified as low risk and 29.7% patients were stratified as high risk

From the above data it was found that 5.6% of patients of the study group were wrongly stratified as low risk according to the Edinburgh Dysphagia Score in spite of having cancer. This group represents the false negative results given by the Edinburgh Dysphagia score in this study. There were 157 true positive cases, 19 true negative cases and 49 false positive cases in the study.

The parameters used in the Edinburgh Dysphagia score are mainly subjective, hence these may represent a potential problem in the scoring system. The weight loss of 3 kilograms in 6 months is an arbitrary and requires better definition. Another factor which might have contributed to the varied results is that the population which we studied was entirely different. We also feel that certain risk factors like smoking and alcohol could have been considered in the scoring system to make it more reliable.

The Edinburgh Dysphagia score is definitely a useful tool for diagnosis of oesophageal cancer, however we feel that certain modifications in the scoring system, by including risk factors and decreasing the subjective parameters can produce a better scoring system. This scoring system can probably be better validated if more studies are done in larger and different populations.

V. CONCLUSIONS

The sensitivity of Edinburgh dysphagia score is 89.2% hence it cannot be used to definitely rule out cancer in patients stratified at low risk.

Patients with low risk according to EDS also need to be thoroughly investigated to rule out malignancy.

However more studies in different geographical regions may be required to study the validity of the score in different populations.

REFERENCES

[1]   Rhatigan E, Tyrmpas I, Murray I, Plevris JN. Scoring system to identify patients at high risk of esophageal cancer. British Journal of Surgery. 2010; 97: p. 1831-187.

[2]   Kapoor N, Bassi A, Sturgess R, Bodger K. Predictive value of alarm features in a rapid access upper gastrointestinal cancer service. Gut. 2005; 54: p. 40–45.

[3]   Varadarajulu S, Eloubeidi M, Patel R, Mulchay H, Barkun A, Jowell P. The yield and the predictors of esophageal pathology when upper endoscopy is used for the initial evaluation of dysphagia. Gastrointest Endosc. 2005; 61: p. 804-808.

[4].   Thomson A, Barkun A, Armstrong D. The prevalence of clinically significant endoscopic findings in primary care patients with uninvestigated dyspepsia: the Canadian Adult Dyspepsia Empiric Treatment - Prompt Endoscopy (CADET-PE) study. Aliment Pharmacol Ther. 2003; 17: p. 1481–91.