



Correlation of Preoperative Geriatrics 8 Score and Postoperative Complications in Older Adult Patients with Head and Neck Cancer: A Prospective Observational Study

Chindavijak S* and Lertseree S

Center of Excellence in Otolaryngology Head & Neck Surgery, Thailand

*Corresponding author: Center of Excellence in Otolaryngology Head & Neck Surgery, Rajavithi Hospital, Bangkok, Thailand, Email: jksomjin@hotmail.com

Research Article

Volume 8 Issue 1

Received Date: April 03, 2023

Published Date: April 27, 2023

DOI: 10.23880/ooaj-16000261

Abstract

Objective: To study the correlation between score on the Geriatric 8 (G8) preoperative assessment scale and major postoperative complications in older adult patients with head and neck cancer.

Material and Methods: A prospective study of older adult patients with head and neck cancer who underwent surgery during December 2020 to June 2022 was conducted after ethical approval was received from Rajavithi Hospital committee. G8 scores were collected before surgery and their correlation with complication outcomes analyzed.

Results: Of 104 patients included in this study, mean age was 68.84 ± 6.99 years. Patients with G8 score ≤ 14 (73 cases, 70.2%) were classified as the frail group and 30 patients (28.8%) had Clavien-Dindo complications at grade III-IV, among which 26 (86.7%) were in the frail group and 4 (13.3%) were in the non-frail group, which was a significant difference ($p = 0.019$).

Conclusion: G8 score was correlated with major postoperative complication, and has potential for application as preoperative assessment tool, in older adult patients undergoing surgery for head and neck cancer.

Keywords: Geriatric 8 Score; Geriatric Head and Neck Cancer; Post-Operative Complications

Abbreviations: CGA: Comprehensive Geriatric Assessment; ECG: Electrocardiogram.

Introduction

The care of older adult patients with head and neck cancer is a growing challenge for otolaryngologists. Overall, the world is experiencing a growth in the population aged ≥ 65 years, which is predicted to be above 1.5 billion by 2050 [1]. In Thailand the population of older adults increased from 17.6% in 2018 to 18% in 2020 [2], and the number

of head and neck cancer cases also increased in this group. Standard treatment for head and neck cancer generally involves major surgery, which is accompanied by concerns regarding postoperative complications in older patients, because of underlying disease and physiological changes that affect capacity to tolerate stress, particularly in those with advanced stage tumors.

Chronological age alone is not a reliable predictor of postoperative complications, as it does not capture the physiological heterogeneity in the older adult population

[3,4]. Hence, in the absence of appropriate tools to predict patient prognosis, treatment plans tend to deviate from standard guidelines, due to age-related patient factors.

To identify older adults who are fit to undergo surgery and those who need special care, preoperative assessment tools are essential. There are concerns that the traditional assessment conducted for all patients is insufficient to predict postoperative complications in older adults. Frailty is a term used to describe older adults with limited overall reserve to withstand stressors, representing a state of reduced physiological reserves associated with increased susceptibility to disability [5]. By definition, a frail individual is highly susceptible to poor healthcare outcomes. The Comprehensive Geriatric Assessment (CGA) for frailty has been recommended by The Society for International Oncology in Geriatrics for administration to older patients who are receiving cancer care [6]. The CGA is a multidimensional, multidisciplinary process, including assessment of physical, functional, co-morbidity, cognitive, nutrition, polypharmacy, social support, and mental status, as well as evaluation of mobility/balance, and is time consuming to administer [7,8]. Bellera, et al. [9] reported a Geriatric 8 (G8) score cut-off value of 14 for older adult patients with cancer who were scheduled to undergo chemotherapy, with sensitivity of 85% relative to a reference exam, consisting of seven comprehensive geriatric assessment questionnaires. The G8 has the advantage of being relatively simple to administer; however, the predictive value of the G8 score for postoperative complications following surgery has yet to be explored. Many studies have reported high accuracy for prediction of postoperative complications in treatment of other cancers [10-12]; however, some reports suggest that the G8 may not be a useful predictive tool [13], and there have been few studies of application of the G8 in patients undergoing surgery for head and neck cancer. So the G8 score is chosen for study of feasibility to be a preoperative assessment tool instead of CGA in the situation of large workload in everyday practice.

The objective of this study was to examine the correlation between preoperative G8 score and major postoperative complications in older adult patients with head and neck cancer that whether can apply for practical routine assessment or not.

Materials and Methods

Patients

This research was approved by the Ethics Committee of Rajavithi Hospital (EC number, 63229). A prospective study was performed by collecting data from all patients aged ≥ 60

years which considered of older adult in Thailand who were first diagnosed with head and neck cancer and treated by surgery at the Center of Excellence in Otolaryngology Head and Neck Surgery, Rajavithi Hospital from 30th January 2021 to 25th January 2022. The recurrent cases and the cases with history of head and neck radiation and/or chemotherapy were excluded due to high risk of complications from previous treatment. Written informed consent for G8 score evaluation was requested by physicians in our department.

Physical Examination and Data Collection

All patients were evaluated by routine preoperative assessment, including complete blood count, liver function test, electrolytes, blood urea nitrogen, creatinine, electrocardiogram (ECG), and chest x-ray.

Patients with underlying conditions or who had abnormal results of blood chemistry, ECG, or chest x-ray, were referred for specialist consultation and were evaluated as low to intermediate risk of complications and surgery was performed as planned. Patients who were evaluated as high risk of complications were excluded. Patient data recorded included age, sex, site of cancer, stage of cancer, type of operation (including resection and reconstruction), intraoperative blood loss, duration of operation, and post-operative complications.

Preoperative Assessment

G8 questionnaires were completed at the outpatient department. G8 scores comprised 8 items and generated a total score from 0–17. Item 1: has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing, or swallowing difficulties, response score: 0 = severe decrease in food intake, 1 = moderate decrease in food intake, 2 = no decrease in food intake. Item 2: weight loss during the last 3 months, response score: 0 = weight loss > 3 kg, 1 = does not know, 2 = weight loss between 1 and 3 kg, 3 = no weight loss. Item 3: Mobility, response score: 0 = bed or chair bound, 1 = able to get out of bed/chair but does not go out, 2 = goes out. Item 4: Neuropsychological problems, response score: 0 = severe dementia or depression, 1 = mild dementia, 2 = no psychological problems. Item 5: body mass index (BMI=weight in kg/height in m²), response score: 0 = BMI < 19, 1 = BMI 19 to < 21, 2 = BMI 21 to < 23, 3 = BMI ≥ 23 . Item 6: Takes more than three prescription drugs per day, response score: 0 = yes, 1 = no. Item 7: In comparison with other people of the same age, how does the patient consider his/her health status, response score: 0.0 = not as good, 0.5 = does not know, 1.0 = as good, 2.0 = better. Item 8: Age, response score: 0 > 85 years, 1 = 80–85 years, 2 < 80 years. G8 score was the sum of all scores from each item and

patients with scores ≤ 14 were defined as having frailty.

Evaluation of Post-Operative Complications

Post-operative complications within 30 days were recorded and graded using the Clavien-Dindo classification, as follows: Grade 0, no complication. Grade I, any deviation from the normal postoperative course, without the need for pharmacological treatment or surgical, endoscopic, or radiological interventions. Allowed therapeutic regimens were drugs, including antiemetics, antipyretics, analgesics, diuretics, and electrolytes, and physiotherapy. This grade also included wound infections opened at the bedside. Grade II, requiring pharmacological treatment with drugs other than those allowed for grade I complications, as well as blood transfusions and total parenteral nutrition. Grade III, requiring surgical, endoscopic, or radiological intervention. Grade IV, life threatening complication (including CNS complication) requiring IC/ICU management. Grade V, death of the patient [14,15]. Clavien-Dindo grades III–V were defined as major complications.

Statistical Analysis

Correlations between complications and G8 score were analyzed. Qualitative variables are described using counts and proportions. Quantitative continuous variables are described as means and standard deviations for normally distributed data or medians and ranges otherwise. Kruskal Wallis or Mann–Whitney U tests were used for comparisons of continuous data and Chi-square or Fisher's exact tests for categorical data. All tests were two-sided with the significance level set at $p < 0.05$.

Results

A total of 104 cases were included in the study, with mean age 68.84 ± 6.99 years and 71 (68.3%) were male. Among patients, 68 (65.4%) had a history of underlying disease, of which were 46 (67.6%) had hypertension, 21 (30.9%) diabetes mellitus, 17 (25%) dyslipidemia, 12 (17.6%) pulmonary disease, 5 (7.4%) cardiovascular diseases, and 8 (11.8%) others conditions. Overall mean BMI was 22.21 ± 4.3 kg/m². Further, 53 (51%) and 67 (64.4%) patients had histories of alcohol consumption and smoking, respectively. Regarding cancer site, 56 cases (53.8%) had oral cancer. Advanced stage was present in 86 (82.7%) cases, reconstruction operations were mainly non-free flap (97 cases; 93.3%), and mean duration of operation was 5.31 ± 2.41 h and > 4 h in 75 (72.1%) cases. American Society of Anesthesiologists score was < 3 in 78 (75%) cases and G8 score was ≤ 14 in 73 (70.2%) cases, who were defined as the frail group. Patient characteristics are summarized in Table 1.

Characteristic	n (%), mean \pm SD
Sex	
Male	71 (68.3)
Female	33 (31.7)
Age (years)	
60–69	61 (58.7)
70–79	31 (29.8)
≥ 80	12 (11.5)
BMI (kg/m ²)	
< 18.5	21 (20.2)
18.50–22.99	41 (39.4)
23.00–24.99	15 (14.4)
≥ 25.00	27 (26.0)
Underlying disease	
No	36 (34.6)
Yes	68 (65.4)
Hypertension	46 (67.6)
Diabetes mellitus	21 (30.9)
Hyperlipidemia	17 (25.0)
Pulmonary disease	12 (17.6)
Cardiovascular disease	5 (7.4)
Others	8 (11.8)
Alcohol consumption history	
No	51 (49.0)
Yes	53 (51.0)
Smoking History	
No	37 (35.6)
Yes	67 (64.4)
Cancer site	
Oral cancer	56 (53.8)
Other head and neck cancer	48 (46.2)
Cancer Stage	
Early stage	18 (17.3)
Advanced stage	86 (82.7)
Reconstruction	
Free flap	7 (6.7)
Non-free flap	97 (93.3)
Duration of operation (h)	
< 4	29 (27.9)
≥ 4	75 (72.1)
ASA score	
≥ 3	26 (25.0)
< 3	78 (75.0)
G8 score	
≤ 14	73 (70.2)
> 14	31 (29.8)

Table 1: Patient Characteristics (N = 104).

BMI, Body Mass Index; ASA, American Society of Anesthesiologists; G8, Geriatric 8.

Major post-operative complications (Clavien-Dindo Grade III-V) were reported in 30 cases (28.9%), including

26 (86.7%) in the frail group and 4 (13.3%) in the non-frail group, which was a significant difference ($p = 0.019$). Hence, G8 score was significantly associated with complication group (Table 2).

Factor	Post-operative complication		p-value
	Clavien-Dindo Grade III-V (n = 30)	Clavien-Dindo Grade 0-II (n = 74)	
G8 score			0.019*
≤ 14	26 (35.6%)	47 (64.4%)	
> 14	4 (12.9%)	27 (87.1%)	

Table 2: Correlation of G8 Score with Post-Operative Complications (N = 104).

The major complications which were Clavien-Dindo grade VI-V were death in 2 cases, septic shock in 8 cases, myocardial infarction in 2 cases, upper airway obstruction due to bilateral vocal cord paralysis in 2 cases and pneumothorax in 1 case. All of Clavien-Dindo grade III was complications of surgical wound that needed debridement in 15 cases as shown in (Table 3).

Complications (all = 30 cases)	N (%)
Death	2 (6.6)
Septic /cardiogenic shock	8 (26.6)
Myocardial infarction	2 (6.6)
Upper airway obstruction due to bilateral vocal cord paralysis	2 (6.6)
Pneumothorax	1 (3.6)
Wound dehiscent /wound infection	15 (50)

Table 3: The Data of Major Post-Operative Complications.

Discussion

Care of older adult patients with head and neck cancer undergoing planned resection of primary cancer is challenging due to increases in the number of patients and high rates of postoperative complications. In many centers, routine preoperative assessment of the fitness of older adult patients scheduled for surgery for head and neck cancer is the same as that used for the general population, and does not categorize patients according to frailty. The objective of preoperative assessment is to identify older adult patients who are at risk of post operative complications and need intensive care, or to inform reconsideration of the surgical management plan. All of the older adult patients who participated in this study were evaluated as low to intermediate risk by routine preoperative assessment; however, the complication rate differed among groups. The CGA [16] is accepted as the standard of care for evaluation

the status of older adult patients and comprises a set of six questionnaires: Activities of Daily Living, Instrumental Activities of Daily Living, 4-item Geriatric Depression Scale, Mini Mental State Examination, Mini Nutritional Assessment Short Form, and questions about any falls in the previous year. CGA results are considered abnormal when a patient has an impaired score on at least one questionnaire. The CGA is time consuming in practical application, whereas the G8 takes 3–5 min to administer and consists of seven items, dealing with food intake, weight loss, mobility, neuropsychological problems, BMI, prescription drugs, and self-perception of health which making it simpler to apply in practice [17].

The main finding of the present study was that G8 score ≤ 14 can predict postoperative complications, underlining the practical utility of this alternative preoperative assessment method for older adult patients. Conventional assessment of the older adults scheduled for surgery to treat head and neck cancer in our department indicated that they were all low risk for surgery; however, we found that 70.2% of patients were classified as frail, which was higher than expected, as the patients had already been selected for surgery by traditional assessment. Handforth, et al. reported that median overall prevalence of frailty across studies that identified frailty using the CGA was 43% (range 7%–68%) [18,19]. In this study, patients in the frailty group according to G8 score had higher rates of complication than those in the non-frailty group, consistent with previous reports [18-21], including a recent investigation by Nakayama, et al. [21] of older adults patients undergoing free-flap reconstruction following head and neck cancer [22].

As our department is a super-tertiary center that performs a high volume of surgery for cases with head and neck surgery annually, a preoperative assessment tool that can predict postoperative outcomes is important for making appropriate care plans to prevent postoperative complications in older adults who experience surgical and non-surgical complications. Non-surgical complications,

such as postoperative delirium, heart failure, myocardial infarction, and pneumonia, are usually of less concern in patients with normal results of physical assessment, such as ECG, blood chemistry, and chest x-ray. Here, we report application of an additional assessment tool in older adult patients with head and neck cancer, which provides more information for otolaryngologists and other team members to inform counselling regarding morbidity and mortality from surgery and individual treatment plans; for example, reconsideration of surgical plan or preparation of a multidisciplinary team for intensive care during the postoperative period.

This study has limitations. The study subjects included few cases of free-flap reconstruction, which involves an extended operation duration and severe stress for older adult patients; therefore, it is unclear whether G8 score can predict postoperative complications under these circumstances. Further the variation in cancer sites and surgeons included in this study may have influenced the observed complications and should be controlled for in future investigations.

Conclusion

G8 score is a geriatric assessment tool that can be applied for routine preoperative evaluation of older adult patients with head and neck cancer to predict postoperative complications and inform management plans for those classified in the frail group, with the aim of reducing postoperative morbidity and mortality.

Acknowledgements

We thank all staff members at the Division of Medical Research, Rajavithi Hospital and acknowledge publication of a preprint on MedRxiv, the preprint server for health sciences.

References

- (2019) World population ageing (2019) highlights. United Nations, Department of Economic and Social Affairs Population Division pp: 1-38.
- Website of the Department of older persons.
- Badgwell B, Stanley J, Chang GJ, Katz MHG, Lin HY, et al. (2013) Comprehensive geriatric assessment of risks factors associated with adverse outcomes and resource utilization in cancer patients undergoing abdominal surgery. *J Surg Oncol* 108(3): 182-186.
- Richards SJG, Frizelle FA, Geddes JA, Eglinton TW, Hampton MB (2018) Frailty in surgical patients. *Int J Colorectal Dis* 33(12): 1657-1666.
- Buchner DM, Wagner EH (1992) Preventing frail health. *Clin Geriatr Med* 8(1): 1-17.
- Mohile SG, Velarde C, Hurria A, Magnuson A, Lowenstein L, et al. (2015) Geriatric assessment – guided care processes for older adults: A Delphi consensus of geriatric oncology experts. *J Natl Compr Cancer Netw* 13(9): 1120-1130.
- Parker SG, McCue P, Phelps K, McCleod A, Nockels K, et al. (2018) What is comprehensive geriatric assessment? An umbrella review. *Age Ageing* 47(1): 149-155.
- Robinson TN, Wu DS, Pointer L, Dunn CL, Cleveland JC, et al. (2013) Simple frailty score predicts post-operative complications across surgical specialties. *Am J Surg* 206(4):544-550.
- Bellera CA, Rainfray M, Pelissier SM, Mertens C, Delva F, et al. (2012) Screening older cancer patients: first evaluation of the G-8 geriatric screening tool. *Ann Oncol* 23(8): 2166-2172.
- Traunero F, Claps F, Silvestri T, Mir MC, Ongaro L, et al. (2022) Reliable prediction of post-operative complications' rate using the G8 screening tool: A prospective study on elderly patients undergoing surgery for kidney cancer. *J Clin Med* 11(13): 3785.
- Anic K, Flohr F, Schmidt MW, Krajnak S, Schwab R, et al. (2023) Frailty assessment tools predict perioperative outcome in elderly patients with endometrial cancer better than age or BMI alone: A retrospective observational cohort study. *J Cancer Res Clin Oncol* 149(4): 1551-1560.
- Lee YH, Oh HK, Kim DW, Ihn MH, Kim JH, et al. (2016) Use of a comprehensive geriatric assessment to predict short-term postoperative outcome in elderly patients with colorectal cancer. *Ann Coloproctol* 32(5): 161-169.
- Penning Y, Asmar AE, Moreau M, Raspe J, Lago LD, et al. (2022) Evaluation of the comprehensive geriatric assessment (CGA) tool as a predictor of postoperative complications following major oncological abdominal surgery in geriatric patients. *PLOS ONE* 17(3): e0264790.
- Dindo D, Demartines N, Clavien PA (2004) Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. *Ann Surg* 240(2): 205-213.
- Bollinger M, Kroehnert JA, Molineus F, Kandioler D, Schindl M, et al. (2018) Experiences with the standardized classification of surgical complications (Clavien-Dindo) in general surgery patients. *Eur Surg*

- 50(6): 256-261.
16. Lee Y, Oh HK, Kim DW, Hoon M, Kim JH, et al. (2016) Use of a comprehensive geriatric assessment to predict short term postoperative outcome in elderly patients with colorectal cancer. *Ann Coloproctol* 32(5): 161-169.
 17. Takahashi M, Komine K, Yamada H, Kasahara Y, Chikamatsu S, et al. (2017) The G8 screening tool enhances prognostic value to ECOG performance status in elderly cancer patients: A retrospective, single institutional study. *PLOS ONE* 12(6): e0179694.
 18. Handforth C, Clegg A, Young C, Simpkins S, Seymour MT, et al. (2015) The prevalence and outcomes of frailty in older cancer patients: a systematic review. *Ann Oncol* 26(6): 1091-1101.
 19. Noor A, Gibb C, Boase S, Hodge JC, Krishnan S, et al. (2018) Frailty in geriatric head and neck cancer: A contemporary review. *Laryngoscope* 128(12): E416-E424.
 20. Cleere EF, Davey MG, O'Neill JP (2022) Age is just a number, frailty as a marker of perioperative risk in head and neck surgery: systematic review and meta analysis. *Head Neck* 44(8): 1927-1939.
 21. Nakayama Y, Ohkoshi A, Ishii R, Higashi K, Nakanome A, et al. (2022) The geriatric-8 screening tool for predicting complications in older adults after surgery for locally advanced head and neck cancer with free flap reconstruction. *Eur Archiv Oto-Rhino-Laryngol* 279(5): 2565-2571.
 22. Lertseree S, Chindavijak S (2022) Geriatrics 8 scores as a predictor of postoperative outcome in elderly patients with head and neck cancer in Rajavithi Supertertiary Care Hospital. *MedRxiv*, the preprint server for health science.

