



Use of a simplified geriatric evaluation in thoracic oncology

Tristan Cudennec^a, Thierry Gendry^b, Sylvie Labrune^b, Violaine Giraud^b, Sophie Moulias^a, Laurent Teillet^a, Thierry Chinet^{b,*}

^a Service de Médecine Gériatrique, CHU Ambroise Paré, Assistance Publique – Hôpitaux de Paris, UFR Médicale, Université Versailles Saint Quentin, Paris, France

^b Service de Pneumologie, CHU Ambroise Paré, Assistance Publique – Hôpitaux de Paris, UFR Médicale, Université Versailles Saint Quentin, Paris, France

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ABSTRACT

Management of elderly patients with bronchial cancer should take into account specific factors linked to the patient's age, and the presence of co-morbidities. A geriatric evaluation enables us to use relevant information in the therapeutic decision-making process. However, the Comprehensive Geriatric Assessment described in the literature is tedious and time-consuming. We describe the use of a simplified geriatric evaluation (SGE), in 57 patients aged ≥ 75 years (mean age: 80.8 years) with thoracic cancer, before discussing therapeutic options with colleagues from various departments. This evaluation enabled us to classify the patients into four groups: group 1 consisted of patients in a good general state; group 2+ comprised patients with no more than two stabilized co-morbidities or one poorly or non-stabilized co-morbidity; group 2– comprised patients with more than two stabilized co-morbidities, or at least two poorly or non-stabilized co-morbidities; group 3 consisted of frail patients. The three patients in group 1 did not have any negative factors that could complicate their management and therefore received anti-tumor therapy. The 15 patients in group 3 were considered to have co-morbidities or functional alterations that were too advanced for them to benefit from anti-tumor therapy, and received symptomatic treatment only. Among the 39 patients in the intermediary groups 2+ and 2–, 24 underwent surgery, chemotherapy or radiotherapy (21 (87.5%) patients in group 2+ and 3 (20.0%) patients in group 2–). These data suggest that the SGE is an important aid to decision-making in the management of elderly patients with bronchial cancer.

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1. Introduction

In 2005, life-expectancy in metropolitan France was 83.7 years in females and 76.8 years in males, and this continues to increase [1]; at 75 years of age, life-expectancy is a further 13.2 years in females and 10.4 years in males. Approximately 25% of individuals aged 80 years will become centenarians. Epidemiological data indicate that in 2005 in France, 30% of cancers and 48% of deaths attributable to cancer occurred after the age of 75 years. According to the Institut de Veille Sanitaire, there were 30,651 cases of bronchial cancer in the general population in France in 2005, of which 7545 (24.6%) occurred in elderly patients aged ≥ 75 years. During the same year, there were 26,624 deaths attributable to bronchial cancer in the general population, of which 8753 (32.8%) were in patients aged 75 years or above [2].

The management of elderly patients with cancer may be complicated by various factors. Physiological modifications linked to age and co-morbidities can modify the presentation of some cancers,

and affect tolerance to surgical, interventional, pharmacological or radiotherapy-based anti-cancer treatments. These considerations have led to the suggestion that geriatric evaluation may aid in the decision-making process relating to the management of elderly patients.

The Comprehensive Geriatric Assessment (CGA) is a reproducible procedure which enables the systematic collection of medical, psychological and social information on a patient [3–5]. Its main objective is to help establish a program of care in order to optimize treatment and subsequent management. The CGA includes an evaluation of cognitive function, state of mind, nutritional status, autonomy, and iatrogenic risk. It also includes an analysis of associated co-morbidities and of the patient's social situation [3–5]. Geriatric evaluation also permits the evaluation of factors of frailty which would make anti-cancer treatment, particularly chemotherapy, hazardous, non-effective or even deleterious in terms of survival or quality of life, and also provides information on whether a patient is likely to refuse specific treatment, motivated uniquely by age. Balducci and Extermann proposed an algorithm using data provided by geriatric evaluation to classify elderly patients with cancer into three main groups [6]. Group 1 included patients in good general state, termed “harmonious”,

* Corresponding author at: Service de Pneumologie, AP-HP, Hôpital Ambroise Paré, 9 Avenue Charles de Gaulle, 92104 Boulogne, France. Tel.: +33 1 49 09 58 02.
E-mail address: thierry.chinet@apr.aphp.fr (T. Chinet).

Table 1
Simplified Geriatric Assessment of patients with bronchial cancer.

Aim	Method
Social evaluation	Place of residence: home, type of residence for an elderly, dependent patient Helpers, aids around the home
Iatrogenic risk	Number and classes of drugs
Existence of ≥ 3 co-morbidities significant in geriatrics	Dementia, confusion, depression, incontinence, falls, malnutrition, progressive heart failure, other cancer
Nutritional status	Loss of weight over the previous 3 months ($\geq 5\%$), albuminemia levels
Cognitive functions	Mini Mental State Examination (MMSE) [9], Clock drawing task [10]
State of mind	Mini-Geriatric Depression Scale (mini-GDS) [11]
Risk of fall	Timed “Get up and go” test [12]
Sense organs	Vision and hearing
Autonomy	Instrumental Activities of Daily Living (IADL) [13]

who did not have any serious or non-stabilized co-morbidity, and who presented with normal autonomy. Group 2 included patients termed “intermediate”. These patients were autonomous, but had significant co-morbidities; the desired benefit of using aggressive treatment such as surgery or chemotherapy for the tumor was not clearly defined. Finally, group 3 included patients termed “frail”, who had severe co-morbidities and a loss of autonomy or independence, and for whom aggressive treatment did not appear to be indicated. Geriatric evaluation therefore has the main objective of identifying factors of frailty that would make surgery, radiotherapy or chemotherapy difficult or, in contrast, acceptable for a given patient in the framework of personalized care. The decision to start a specific treatment should take into account the desired survival compared to the survival of a patient without neoplasia, while respecting the patient’s quality of life, the possibility of toxic effects of the drugs used, and the possible deterioration of co-morbidities of the patient.

However, the CGA described in the literature is a long process which is not specifically targeted at neoplastic pathologies. In order to improve the management of elderly patients with bronchial cancer, we have developed a simplified geriatric evaluation (SGE), which is adapted to cancer and is quicker to perform than the CGA. This assessment enables a quick response to the increasing demands of clinical services. This report describes the SGE and its use in patients with thoracic cancer.

2. Material and methods

This was a retrospective study to describe the use of SGE in the management of patients with thoracic cancer treated at a specialized center. SGE was carried out by an interventional geriatric team (IGT) consisting of a geriatrician, a nurse and an ergotherapist.

2.1. Geriatric evaluation

Evaluation of patients with the SGE was completed within approximately 1 h. It consisted of the following items which are summarized in Table 1.

Social evaluation was concerned with the type of support in the patient’s home. It consisted of obtaining information about the patient’s isolation or the family support available to him/her. In particular, it is necessary to know whether a patient lives in his/her own home or in an institution (either medical or not).

Evaluation of iatrogenic risk is essential. Patients >75 years of age are often multipathological and as a consequence receive multiple medications. We conducted a critical review of the patient’s medication list, evaluated drug interactions, adverse effects and patient compliance, and discontinued any nonessential drug [7].

Determination of nutritional status, notably to detect situations of protein-energy malnutrition, is carried out using the Mini Nutritional Assessment (MNA) [8]. The MNA is a scale for the rapid evaluation of nutritional status, validated in geriatric patients. It consists of an initial “detection” stage, which depends on six

items: appetite, weight loss, motor functions, concept of acute illness or psychological stress, existence of neuro-psychological problems, and calculation of body mass index. Depending on the score obtained, a more comprehensive evaluation including 18 items may or may not be carried out. When the total score obtained is between 17 and 23.5/30, there is a risk of malnutrition. When this score is <17/30, the patient is in a poor nutritional state. Blood albumin levels, which are less comprehensive than the MNA, but can be obtained quickly, adequately reflect the nutritional status of the patient during the previous 21 days in the absence of elevated C-reactive protein.

Alteration of cognitive functions is detected by carrying out a Mini Mental State Examination (MMSE) [9] and a clock drawing task [10]. The MMSE uses 30 questions to investigate the patient’s cognitive functions. This test, which can be carried out in approximately 10 min, provides information on the orientation of the patient in time and space, on his medium-term memory (learning and recollection), on mental calculations, attention, language, comprehension and praxis. The clock drawing task consists of showing the patient a piece of paper on which a simple circle has been drawn. After having told the patient that the circle represents the face of a clock, the examiner asks him/her to write on the numbers corresponding to the hours. The second task consists of asking the patient to draw the hands and indicate a precise hour. When the result of MMSE is <26/30 or the clock drawing task is not carried out correctly, a more thorough geriatric evaluation is necessary.

The patient’s state of mind is determined using the mini-Geriatric Depression Scale (mini-GDS) [11]. This test depends on four questions which identify patients with possible depressive syndrome.

Functional autonomy, particularly the evaluation of risk of a fall, a marker of frailty, can be determined by the timed “Get up and go” test [12]. This consists of asking the patient who is sat in a chair, to rise, walk three meters forward, do a half-turn and return to the chair. When the time taken to perform this test is >20 s, there is a risk that the patient concerned will fall. When the time is >30 s, the risk of a fall is significant.

Autonomy in daily activities is evaluated using the Instrumental Activities of Daily Living (IADL) of Lawton and Brody [13]. The IADL concerns activities that are instrumental to daily life such as the ability to use the telephone, using different means of transport, taking responsibility for taking medication, or being able to manage a budget.

2.2. Classification of patients by SGE

According to the results of SGE, patients can be classified into the three groups described by Balducci and Extermann [6]. Thus, patients in group 1 and 3 are relatively easily identified. In contrast, the patients in the second group had a decrease in autonomy in daily life but they are more heterogeneous. For some, there are no more than two stabilized co-morbidities or one poorly or non-stabilized co-morbidity. We have classified these patients into sub-group 2+. The other patients in group 2, who have more than two sta-

Table 2
Characteristics of the patients with bronchial cancer (*n* = 57).

Characteristics	N (%)
Sex	
Female	22 (38.6%)
Male	35 (61.4%)
Mean age (years)	80.8 ± 5.7
≥80	67%
Histological type	
Non-small cell	51 (89.5%)
Small cell	6 (10.5%)
Performance status	
0	3 (5.3%)
1	18 (31.6%)
2	13 (22.8%)
3	14 (24.6%)
4	9 (15.7%)

bilized co-morbidities, or at least two poorly or non-stabilized co-morbidities have been placed in the sub-group 2–. The performance status was determined by chest physicians or oncologists who were unaware of the SGE results. All data were brought to the attention of the chest physicians, oncologists, surgeons, and radiotherapists who participated in the group decision-making process regarding patient management during a multidisciplinary meeting.

3. Results

Between 2005 and 2007, 365 patients were admitted to our center for treatment of bronchial cancer. Fifty-seven of these patients, aged ≥75 years, underwent SGE (15.6%). The mean age of the 57 patients was 80.8 years, and more than one-third were female. Non-small cell bronchial cancer was the most prevalent histological type identified (89.5%). The characteristics of these patients are summarized in Table 2.

The results of SGE are shown in Table 3. All patients except two lived in their own home at the time of evaluation. Mean drug consumption was 6.8 per day. Approximately 58% of patients had between 0 and 2 co-morbidities. Over 75% of patients had hypoalbuminemia leading to investigations for protein-energy malnutrition. In 51% of cases, the existence of cognitive problems was suspected from a score of <26/30 on the MMSE. Similarly, in 47.4% of cases, the score obtained with mini-GDS was ≥1, leading to investigations for and the treatment of depression. Finally, there was a risk of fall in 68% of patients, and loss of autonomy in 44%.

Using evaluations carried out by the geriatric interventional team, the patients were distributed into the three groups described by Balducci and Extermann, dividing the second group into two as described above. Only three (5.3%) patients fell into group 1. Among the 39 (68.4%) patients in the intermediary group 2, 24 (42.1%) were placed in group 2+ and 15 (26.3%) in group 2–. The final 15 (26.3%) patients were placed in group 3. Table 4 shows the distribution of patients according to the four groups defined previously, as a function of their performance status.

Table 5
Treatments received by patients who underwent geriatric evaluation.

Group	No. of patients	Recommendations of the IGT/Treatments received				
		S	C	C + R	R	ST
1	3 (5.3%)	1/1	2/2	–	–	–
2+	24 (42.1%)	2/2	18/14	3/3	0/2	1/3
2–	15 (26.3%)	–	1/3	–	–	14/12
3	15 (26.3%)	–	–	–	–	15/15

IGT: interventional geriatric team; S: surgery; C: chemotherapy; R: radiotherapy (except for radiotherapy aimed at analgesia); ST: symptomatic treatment.

Table 3
Results of simplified geriatric assessment.

Areas investigated	N (%)
Place of residence	
Home	55 (96%)
Institution	2 (4%)
Number of drugs	
Mean	6.8 ± 3.0
≥3	51 (89.4%)
Comorbidities	
Mean	2.6 ± 1.4
0	3 (5.3%)
1	11 (19.3%)
2	19 (33.3%)
>2	24 (42.1%)
Nutritional status: albuminemia (g/l)	
Mean	29.2 ± 6.4
≥35	13 (23%)
Cognitive function (MMSE)	
≥26/30	28 (49%)
<26/30	29 (51%)
State of mind (mini-GDS)	
0	30 (52.6%)
≥1	27 (47.4%)
Risk of fall (timed “Get up and go” test)	
>20 s	39 (68%)
<20 s	18 (32%)
Autonomy (IADL)	
Independent	25 (44%)
Dependent	32 (56%)

MMSE: Mini Mental State Examination; mini-GDS: mini-Geriatric Depression Scale; IADL: Instrumental Activities of Daily Living.

Table 4
Correlation between performance status (PS) and patient group.

Group	PS 0	PS 1	PS 2	PS 3	PS 4
1	2	–	1	–	–
2+	1	14	6	3	–
2–	–	3	2	7	3
3	–	1	2	6	6

The recommendations of the IGT-based on SGE were as follows (Table 5): patients in group 1 were all considered able to receive an optimal treatment by surgery or chemotherapy. Patients in group 3 were all considered not suitable for surgery, chemotherapy and radiotherapy, with the exception of radiotherapy aimed at analgesia. Twenty-three of 24 patients in group 2+ but only 1 of 15 patients in group 2– were considered fit enough to be treated with surgery, radiotherapy or chemotherapy. The final decision at the multidisciplinary meeting matched the IGT's recommendations in all patients in groups 1 and 3, in 20 of 24 patients in group 2+ and in 13 of 15 patients in group 2–.

4. Discussion

This study describes the feasibility and usefulness of SGE in thoracic oncology. The data shows that SGE provides complementary information to the simple determination of performance status. Overall, there seems to be a correlation between the SGE-based classification and the performance status. For instance, none of the patients in group 1 were classified as performance status 3 or 4, as compared to 12.5% of patients in group 2+, 66.6% of patients in group 2– and 80.0% of patients in group 3. However, on an individual basis, there were clear discrepancies between these two evaluations. Three patients with performance status 3 were classified in group 2+. All three patients were treated with chemotherapy despite their low performance status. In contrast, eight patients with performance status of 0–2 were placed in group 2– or in group 3. Five of them were treated with palliative care only, including two patients in group 2– (both with performance status 2) and all three patients in group 3 (performance status of 1 for one patient and of 2 for two patients). Therefore, both the performance status and the SGE-based classification provide a significant aid to the decision-making process in the management of elderly patients with lung cancer.

SGE places patients aged ≥ 75 years with bronchial cancer into one of the three categories proposed by Balducci and Extermann [6]. This classification is aimed at facilitating decisions about the management of this patient population. In addition, our results suggest that separating patients into four categories instead of three may be more relevant for the decision-making process regarding the management of these patients.

Until recently, most clinical studies on the treatment of bronchial cancer excluded patients >75 years of age and patients presenting with co-morbidities regularly encountered in geriatric medicine. However, in 1995 a meta-analysis by the Non-Small Cell Lung Cancer Collaborative Group demonstrated that chemotherapy based on platinum salts is more effective than palliative care in elderly patients [14]. Several studies [15–19] failed to detect any influence of age on the response to chemotherapy in bronchial cancer. Other studies have demonstrated that a large proportion of elderly patients are capable of receiving anti-cancer chemotherapy, even more modern compounds, of being treated by radiotherapy and of undergoing surgical pulmonary excision [14,20]. The management of cancer patients ≥ 75 years of age should therefore be decided according to the oncological reference system, taking into account information provided by geriatric evaluation [6,21–23]. The CGA is a tedious and time-consuming procedure the objective of which is to define an individualized intervention plan based on a multidisciplinary evaluation of an elderly patient [24]. We here propose a simplified multidimensional evaluation, derived from the evaluation part of the CGA, whose main advantage is that it is short and therefore easily applicable to elderly patients treated in oncology centers.

Geriatric evaluation provides information of prognostic value. A study demonstrated that the score obtained from the MNA [8], as well as the extent of the tumor at the time of inclusion (i.e. before receiving the first dose of chemotherapy), were independent predictive factors of early mortality at three months [25]. Furthermore, geriatric evaluation enables the detection of functional, cognitive or mood problems which were previously unrecognized and which should be considered in decisions concerning the management of cancer in this population.

Our study has several limitations. First, we have not demonstrated that taking into account SGE provides a real benefit in terms of survival or quality of life of elderly patients. However, we considered that it was not ethical to include a control group, defined by randomization, which would not have undergone this evaluation. Second, we did not compare SGE and CGA. A prospective

study is currently underway in France. The objective of this pilot study was to determine the feasibility of SGE and to assure ourselves that it could be used in the decision-making process during the management of elderly patients with bronchial cancer. Third, it appears that our evaluation resulted in placing most patients in group 2 of the classification of Balducci and Extermann (i.e. the group where decisions are often difficult to make). However, it is clear that pre-therapy geriatric evaluation is most important in this category of elderly patients with cancer. It should be pointed out that in our study 61.5% of patients in this group were able to start or continue surgical treatment, chemotherapy or radiotherapy. However, our data suggest that this group can be divided into two sub-groups in which management obviously differs; treatment by surgery, chemotherapy or radiotherapy could be proposed for 87.5% of patients in group 2+ compared to only 20.0% in group 2–. Revision of the classification of Balducci and Extermann therefore appears to be justified. Finally, we did not take into account in this study the fact that the SGE evaluation could have been used in the patients' clinical care. This could have modified the patients' medical condition and therefore have affected the final decision regarding the oncological treatment. However, the SGE evaluation was usually performed a few days only before the multidisciplinary meeting where the decision on the treatment of the lung cancer was made.

In conclusion, the increase in prevalence of thoracic cancers in persons aged ≥ 75 years has made it necessary to adapt management to the particular characteristics of this population. We have developed a SGE which is helpful to the multidisciplinary management of these patients. This evaluation also makes clinicians and carers in the different clinical departments sensitive to the unique characteristics of geriatric care. Additional prospective studies are necessary to confirm our results and to identify the geriatric parameters that are essential in the oncological decision-making process.

Conflict of interest

None declared.

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