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Does a Geriatric Oncology Consultation Modify the Cancer Treatment Plan for Elderly Patients?

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Background. This study was performed to describe the treatment plan modifications after a geriatric oncology clinic. Assessment of health and functional status and cancer assessment was performed in older cancer patients referred to a cancer center.

Patients and Methods. Between June 2004 and May 2005, 105 patients 70 years old or older referred to a geriatric oncology consultation at the Institut Curie cancer center were included. Functional status, nutritional status, mood, mobility, comorbidity, medication, social support, and place of residence were assessed. Oncology data and treatment decisions were recorded before and after this consultation. Data were analyzed for a possible correlation between one domain of the assessment and modification of the treatment plan.

Results. Patient characteristics included a median age of 79 years and a predominance of women with breast cancer. About one half of patients had an independent functional status. Nearly 15% presented severe undernourishment. Depression was suspected in 53.1% of cases. One third of these patients had >2 chronic diseases, and 74% of patients took ≥ 3 medications. Of the 93 patients with an initial treatment decision, the treatment plan was modified for 38.7% of cases after this assessment. Only body mass index and the absence of depressive symptoms were associated with a modification of the treatment plan.

Conclusion. The geriatric oncology consultation led to a modification of the cancer treatment plan in more than one third of cases. Further studies are needed to determine whether these modifications improve the outcome of these older patients.

***Key Words*:** Cancer treatment—Geriatric assessment—Elderly.

PEOPLE older than 65 years will account for 25% of the European population by the year 2030 (1). Cancer is often diagnosed at a later stage in older cancer patients compared to younger patients, and it has been reported that older cancer patients tend to receive less aggressive therapy (2,3). This undertreatment decreases the survival of patients with certain cancers (4,5). The optimal management in this heterogeneous population has not been clearly defined in relation to their physical and psychosocial functioning differences. Chronologic age is not always predictive of physiologic decline (6). Only a few clinical trials have been conducted in older patients, resulting in few evidence-based guidelines for this population (7). In addition, a recent study showed that older cancer patients are willing to be treated (8). A geriatric assessment can be used to evaluate the patient's resources and strengths before treatment and may help oncologists to more effectively manage older cancer patients (9–11). This assessment includes the domains of health, functional status, cognition, socioeconomic status, and psychological evaluation (12). The recommendations of the International Society of Geriatric Oncology (SIOG) are to use a Comprehensive Geriatric Assessment in older cancer patients (9), but only one published study has demonstrated the impact of this assessment on cancer treatment (11).

The aim of this study was therefore to describe the patient population and treatment plan modifications after a geriatric oncology clinic in older cancer patients referred to the Institut Curie cancer center.

Patients and Methods

Study Design and Data Collection

This cross-sectional pilot study was conducted between June 2004 and May 2005 at the Institut Curie, a French Comprehensive Cancer Center, in Paris. A Geriatric Oncology Program was initiated with the creation of fruitful collaboration between the Geriatric Department of Georges Pompidou European Hospital and the Department of Medical Oncology at the Institut Curie. An interdisciplinary team was devoted to research and practice in elderly patients, and a weekly clinic for elderly patients with cancer was created in this institution.

This study was approved by the institutional review board. The inclusion criteria were: all cancer patients 70 years old or older referred to this specific geriatric oncology clinic for newly diagnosed cancer (38 patients), disease progression (54 patients), or follow-up (13 patients), for toxicity, treatment proposal, geriatric syndrome, or other clinical questions. Most patients were referred by another physician (surgeon or medical oncologist) at the institution, but some patients were referred by their family practitioner or by another specialist.

The data collected during this consultation with a geriatrics-trained medical oncologist included patient history, oncology data, and a geriatric assessment questionnaire that took about 10 minutes to complete. It was a screening questionnaire to detect problems and to describe the patient's health and functional status, but it was not a comprehensive geriatric assessment that would have been more time-consuming and not feasible in this type of clinic. However, when specific interventions were deemed necessary, patients were referred to the psychologist, social worker, dietician, or other health care professionals or for a comprehensive geriatric assessment in the geriatric department. This study was a pilot study, performed over a period of 1 year to describe the elderly population in a comprehensive cancer center and to determine whether this geriatric oncology clinic could be helpful for the treatment decision process.

Eight domains were selected to assess health and functional status based on their predictive validity in terms of morbidity or mortality (13–16). These domains included functional status, nutritional status, mood, mobility, comorbidity, medication, social support, and residential status.

Functional status was measured using a 6-item Activities of Daily Living (ADL) scale (17), the Instrumental Activities of Daily Living (IADL) scale (18), and the Eastern Cooperative Oncology Group Performance Status (ECOG PS) (19). To assess nutritional status, patients were asked to define their weight loss during the previous 3 months, and the body mass index (BMI) was calculated. A weight loss of $>10\%$ indicates possible malnutrition. A BMI < 18.5 kg/m^2 is considered to reflect underweight according to the World Health Organization and indicates possible undernutrition, but a cutoff of 23 has been suggested to be more appropriate for elderly persons (20).

Mood was assessed by the four-item Geriatric Depression Scale, the mini GDS (21). A score ≥ 1 indicates possible depression. To assess mobility, patients were asked whether they had experienced ≥ 2 falls during the previous year. The types and number of comorbid conditions and the number of current medications were recorded by self-reporting and review of the medical charts with no specific tools. A blood sample was taken to assess the following laboratory markers: albumin, C-reactive protein (CRP), hemoglobin, and creatinine.

The following demographic data were also recorded: age, gender, and living conditions. The cancer treatment proposed by the referring physician before this consultation and the treatment plan modifications suggested after this geriatric oncology assessment were recorded. As no specific guidelines are available for oncologic and geriatric assessment, individualized care programs were defined after this consultation without the use of specific tools. After this consultation, the patient was followed either by the medical oncologist with geriatric training or by the referring physician (medical oncologist or surgeon).

Data Analysis

Descriptive statistics for patient characteristics, health and functional status measurements, and outcome characteristics were calculated. Continuous variables are presented with means or medians in the case of extreme values. For categorical variables, percentages were calculated excluding missing values.

The Chi-square test, or Fisher's exact test when appropriate, was used to determine correlations between modifications of treatment and the various domains assessed. All p values presented are two-sided using an alpha of 0.05.

Table 1. Patient Characteristics

Characteristic	*N* (%)
Male	18 (17)
Female	87 (83)
Age, median (range)	79 (70–97)
Diagnosis	
Breast cancer	64 (60.9)
Lung cancer	6 (5.7)
Colorectal cancer	7 (6.7)
Cervix carcinoma	4 (3.8)
Endometrial cancer	3 (2.8)
Ovarian cancer	1 (0.9)
Prostate cancer	2 (1.9)
Choroidal melanoma	3 (2.8)
Hematologic malignancy	2 (1.9)
Other	13 (12.3)
Presence of metastases	60 (57.1)
Referred by	
Institution	54 (51.4)
Others	50 (49.6)
Treatment at the time of referral	
Yes	42 (40)
No	63 (60)

Results

One hundred five patients with a mean age of 79 years (range: 70–97 years) were included in this study. Table 1 presents the patient characteristics. Women represented 83% of this sample, and 60.9% of patients had breast cancer. More than one half of these patients had not received any specific cancer treatment at the time of their visit to this consultation, 51.4% presented progressive disease, and 57% had metastatic disease.

Results of the geriatric assessment questionnaire are presented in Table 2. Nearly 58% of all patients were independent for ADL and 46% for IADL. Sixty percent of patients had an ECOG PS of 0–1. About 20% had a good nutritional status, with BMI ranging between 23 and 25 kg/m^2. However, about 14% presented a poor nutritional status, with BMI < 18.5 kg/m^2. Only 7.7% had lost more than 10% of their predisease weight during the previous 3 months. Nearly 20% of patients had impaired mobility, with ≥ 2 falls during the previous year. Depression was suspected in 53.1% of this population. One third of patients had >2 chronic diseases, and 74% took ≥ 3 medications. One third of the patients had >2 comorbidities; the most frequent was high blood pressure (47% of the patients). Laboratory tests showed that one half of this population presented anemia with a hemoglobin level <12 g/dL, and most patients (60%) presented a serum albumin level between 35 and 55 g/L.

Table 2. Health and Functional Status: 8 Domains Assessed

Domains	*N* (%); Mean ± *SE*, [Min–Max]
Functional Status	
ADL	
Independent	55 (58)
Dependent	40 (42)
IADL	
Independent	46 (46)
Dependent	54 (54)
ECOG PS	
0	12 (12.5)
1	46 (47.9)
2	31 (32.3)
3	7 (7.3)
4	0 (0)
Nutrition	
Weight loss in the last 3 mo > 10%	7 (7.7)
BMI, kg/m^2	
Mean	23.8 ± 0.47 [14.5 - 41]
<18.5	14 (13.6)
18.5–21 = denutrition	13 (12.6) = 47 (45.6)
21–23	20 (19.4)
23–25	21 (20.4)
25–50	35 (34)
Mood	
Mini GDS (≥1 depressive symptom)	43 (53.1)

Table 2. Health and Functional Status: 8 Domains Assessed (*Continued*)

Mobility	
≥2 falls in the last year	20 (19.8)
Comorbidity (*n* evaluable)	
Diabetes (103)	9 (9)
Hypertension (104)	49 (47)
Chronic renal failure (101)	3 (3)
Stroke (104)	3 (3)
CHF (101)	2 (2)
Coronary disease (95)	14 (15)
Other (82)	50 (61)
No. of comorbidities	
0	11 (15.3)
1	37 (51.4)
≥2	24 (33.3)
Medications ≥3/d	71 (74)
Social support (caregiver present)	84 (83.1)
Living in a nursing home	11 (10.6)

Note: *SE* = standard error; ADL = Activities of Daily Living; IADL = Instrumental Activities of Daily Living; ECOG PS = Eastern Cooperative Oncology Group Performance Status; BMI = body mass index; mini GDS = mini Geriatric Depression Scale; CHF = chronic heart failure.

No treatment plan was proposed before the consultation for 12 patients, so that modification of the treatment plan was calculated for only 93 patients. The treatment plan was modified after the geriatric oncology consultation in 38.7% of cases. Details of treatment plan modifications are shown in Table 3.

Data were analyzed to detect any correlations between one of the domains of the geriatric assessment and modification of the treatment plan (Table 4). No statistically significant differences were observed for ADL, IADL, ECOG PS, number of falls, number of comorbidities, hemoglobin, or albumin. More modifications of the treatment plan were observed for patients with BMI ≤ 23 kg/m^2 than for patients with BMI > 23 kg/m^2 ($p = .029$) and in nondepressed patients according to the mini GDS than in patients with symptoms of depression ($p = .018$).

Discussion

To our knowledge, this is the first study to describe modifications of a treatment plan following a geriatric oncology consultation. The large number of treatment plan modifications observed in our study showed that this specific geriatric oncology assessment addresses issues that might not be obvious on a routine physical examination and clinical history. Modifications of the treatment plan mainly concerned the indications for chemotherapy in 28 of 51 cases. In 6 of these cases, the chemotherapy protocol was modified with the use of different drugs because of comorbidity, functional status, or denutrition (BMI < 23 kg/m^2), and in 7 cases no chemotherapy was delivered.

In a pilot study including 15 early breast cancer patients 70 years old or older, Extermann and colleagues (11) suggested that a comprehensive geriatric assessment with

Table 3. Treatment Plan

Treatment Plan	
Suggestion before Consultation	Suggestion after Consultation
51 patients: chemotherapy	23 no modification (45%) 28 modifications (55%) - No chemotherapy: 7 - Hormonal therapy: 4 - Dose modification: 1 - Other protocol: 14 - Refusal to be treated: 2
4 patients: chemotherapy + hormonal therapy	3 no modification (75%) 1 modification (25%) (one drug stopped due to comorbidity)
3 patients: chemotherapy + radiotherapy	1 no modification (33%) 2 modifications (67%): no chemotherapy (due to functional status and comorbidity)
16 patients: hormonal therapy	15 no modification (94%) 1 modification (6%) (chemotherapy suggested)
1 patient: chemotherapy or surgery or hormonal therapy?	1 modification: chemotherapy
2 patients: surgery	2 modifications (no surgery because of denutrition and functional status)
4 patients: radiotherapy ± hormonal therapy	0 modification
1 patient: chemotherapy + surgery	0 modification
11 patients: watchful waiting	1 modification (9%)
Total: 93 patients	36 modifications (38.7%)

follow-up has the potential to improve the treatment and prognosis of these patients. Their intervention directly influenced oncologic treatment in four cases. However, this study was based on a small sample size, and no other prospective studies investigating the impact of a geriatric oncology consultation on the oncologic treatment decision have been conducted to date. No other study has shown whether a geriatric oncology consultation could be useful to tailor cancer treatment. The meta-analysis by Stuck and colleagues (22) suggested that comprehensive geriatric assessment programs linking geriatric evaluation with strong long-term management are effective for improving survival and function in older patients, but this was not specifically investigated in older cancer patients. Recently, Hurria and colleagues (23) published a prospective, longitudinal study of older patients with breast cancer receiving adjuvant chemotherapy. In this study, high levels of treatment toxicity were recorded; nevertheless, no change of functional status and quality of life was observed. More sensitive measures than the traditional measures used in geriatrics are necessary to identify frail elderly patients. The inclusion of frailty assessment might therefore identify more vulnerable patients at risk of adverse outcomes of treatment.

On the basis of our assessment, older patients referred to a cancer center were more vulnerable than expected. More than one half of these patients presented IADL disability, and 40% had an ECOG PS of $\geq$2. Forty-five percent of our population were malnourished, with a BMI $<$ 23 kg/m^2. In

comparison, Hurria and colleagues (24) described only 5% of patients with BMI < 22 kg/m^2 in their pilot study of 43 older patients receiving chemotherapy. One hypothesis to explain this difference is a higher level of obesity in their study (23%), making the weight lost over previous months more relevant. The large number of modifications of the treatment plan in patients with a low BMI suggests that undernourishment is not correctly assessed in daily practice by oncologists.

Assessment of mood detected a high prevalence of possible depression: Almost one half of our patients reported depressive symptoms. Malnutrition and depression are both associated with an increased risk of functional decline and death, independent of other comorbidities and disease severity (15). Passik and colleagues (25) reported that the frequency of depression in cancer patients varied from 4.5% to 53% according to the studies, but with an average of 20%–25%. However, these studies used different instruments and study samples. Balducci and Beghe (12) reported depression in >20% of their patients 70 years old or older when using the GDS. Using a cutoff score of ≥11 for the 30-item scale, the scale had a sensitivity of 84% and a specificity of 95% for the diagnosis of clinical depression (26). Perhaps the short scale form used could explain the high likelihood of depressive symptoms in our study. This study shows that the treatment plan was modified significantly more frequently when no depression was suspected on the GDS than when depression was suspected. Two hypotheses can be proposed: The first is that physicians who referred patients for geriatric oncology consultation detected depression and tailored treatment, and the second is that suspicion of depression was not a major parameter in the choice of cancer treatment.

Concerning the comorbidity burden, one third of the population presented >2 chronic diseases. Patients with ≥3 of 7 selected comorbid conditions had a 20-fold higher rate of mortality from causes other than breast cancer and a 4-fold higher rate of all-cause mortality when compared with patients without comorbid disease (27). In another study conducted by the Institut Curie, >50% of women older than 70 years treated for operable breast cancers died from causes other than their breast cancer (28). This shows that comorbidity must be taken into account in treatment decisions for older cancer patients.

In terms of laboratory markers, more than half of our patients suffered from anemia. A number of studies have shown that anemia is correlated with functional decline and mortality (29–31). Anemia is the most common hematologic abnormality observed in cancer patients. A large European survey of cancer patients reported that 67% had anemia at some point during the survey (32). A better understanding of anemia in the elderly population would lead to improved treatment strategies, including the more judicious use of transfusion and appropriate use of erythropoietic agents.

This study has several limitations that need to be addressed. First, we cannot exclude a potential referral bias. Physicians who referred their older patients for this geriatric oncology consultation might have referred only those patients with more health and psychological problems compared to patients who were not referred, which might have led to overestimation of the rates presented in this study. Second, no cognitive assessment was performed during these evaluations, but a two-step approach could be proposed according to the ''recommendations from the task force on CGA of the International Society of Geriatric Oncology (SIOG)'' (9). Third, the small sample sizes of some groups may also explain why analysis of the domains associated with modification of the treatment plan failed to demonstrate significant correlations.

Table 4. Correlation between Domains of the Geriatric Assessment and Modification of the Treatment Plan

Variable	*N*	% Treatment Plan Modifications	*p* Value
ADL			
Independent	16	32	.12
Dependent	17	48.6	
IADL			
Independent	13	31.7	.16
Dependent	23	46	
ECOG PS			
0–1	20	37	.30
≥2	15	48.4	
BMI			
≤23	20	51.3	.029
>23	15	28.8	
Falls			
≥2/y	7	36.8	.83
<2/y	28	39.4	
Mini GDS			
0	18	54.5	.018
≥1	11	27.5	
Comorbidity			
0–1	14	33.3	.33
≥2	22	43.1	
Hb			
<12	14	33.3	.25
≥12	20	45.5	
Albumin			
>35	24	42.9	.64
20–35	3	60	

Note: ADL = Activities of Daily Living; IADL = Instrumental Activities of Daily Living; ECOG PS = Eastern Cooperative Oncology Group Performance Status; BMI = body mass index; mini GDS = mini Geriatric Depression Scale; Hb = hemoglobin.

Conclusion

The information provided by a geriatric oncology consultation could be useful to tailor treatment for older cancer patients. Further studies are needed to identify whether these treatment plan modifications improve the outcomes of older patients in terms of quality of life, toxicity, or response rates and which measurement instruments are most sensitive to detect change and predict treatment outcomes.

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