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## Original research article

## Assessment of health status in elderly patients with cancer

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## ABSTRACT

**Background:** Health status assessment of senior adults is one of the most important aspects of a treatment decision making process. A group of elderly cancer patients is very heterogeneous according to the health status – some of them are fit enough for aggressive treatment, but others are frail and vulnerable. Treatment for the latter group has to be adapted and carefully monitored.

**Aim:** To review and analyze relevant literature on the usage and optimization of Comprehensive Geriatric Assessment (CGA).

**Materials and methods:** Medline search of studies published between 2000 and 2011, containing key words: Comprehensive Geriatric Assessment, aging, cancer in senior adults, frailty.

**Results:** To recognize and address individual needs of senior adults, a special holistic approach has been developed – comprehensive geriatric assessment (CGA). This tool is a gold standard in gerontooncology, recommended by International Society of Geriatric Oncology. CGA evaluates all important health domains, from physiology to social and economical problems, using sets of different tests. Assessment has to be performed by a trained team, including a physician, nurse and social worker. CGA has been clinically validated in many studies, but it is still not clear whether CGA improves the outcome of treatment of the elderly with cancer.

**Conclusions:** Complexity and multidimensionality of CGA pose a logistic challenge for everyday clinical practice. Special senior programs, which could be developed inside comprehensive cancer center, focusing attention on seniors' problems and needs seem to be a way forward for geriatric oncology.

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## 1. Background

European population is undergoing considerable demographic transformation.<sup>1</sup> Aging promotes various changes in physiological and biological processes which may lead to the

developing of cancer. Thus, oncologists have to face a new challenge: treatment of cancer in a group of patients who are vulnerable and frail, with numerous comorbidities and impairment of functional status.

Treatment results in elderly patients with cancer are still unsatisfactory. A striking minority of patients over 75 years are

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treated aggressively with radical intent, negatively impacting survival rate. It has been shown in breast and lung cancer<sup>2,3</sup> as well as for most other cancer sites.<sup>4</sup>

What are the reasons for such a situation? An important role is played by the fact that age is considered to be the main criterion of treatment decision, whereas senior population is highly heterogeneous with regard to health status. Some senior patients, despite relatively good condition before treatment, experience the exhaustion of physiological reserves, under stress condition such as during treatment. They need a careful assessment of changes in their health status and adaptation of treatment plan. The essence of appropriate evaluation of seniors' health lies in its multidimensionality and has to be performed in the most important domain of health. A gold standard in geriatric evaluation of older patients, recommended by the International Society of Geriatric Oncology (SIOG), is the Comprehensive Geriatric Assessment (CGA).<sup>5</sup> In this thorough approach, a global health status of seniors is assessed in various domains by an interdisciplinary team. CGA has been clinically validated in many studies,<sup>6–8</sup> although it is still not clear whether the use of CGA influences overall survival of the elderly with cancer. Moreover, the complexity of this approach requires the involvement of a team of specialists – minimally a physician, a nurse and a social worker. Full CGA is time consuming and logistically complex, which poses a challenge to a multidisciplinary team in making a treatment decision for an individual senior.

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## 2. Aim

The aim of this review is to analyze relevant literature on the usage and optimization of CGA.

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## 3. Materials and methods

Medline search was performed of peer review studies published between 2000 and 2011, containing keywords: Comprehensive Geriatric Assessment; aging; cancer in senior adults; frailty. Reference lists from relevant studies were scanned to identify any additional studies.

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## 4. Results

### 4.1. Comprehensive geriatric assessment in clinical practice

CGA is a multidisciplinary process able to identify medical, social, and functional abilities of older adults. This special diagnostic procedure detects and explains patients' limitations and problems missed by a standard physical examination which may affect results of oncological treatment. Moreover, needs of patients are recognized and addressed, and individual treatment and care plans are developed. CGA usage in clinical practice is aimed at improvement in diagnostic accuracy, predictability of outcomes, as well as monitoring of the whole treatment process and follow-up.<sup>9</sup>

The concept of modern geriatric assessment was developed by Warren in the 1930s and expanded into a

comprehensive set of instruments for geriatric evaluation. Components of a full CGA include an evaluation of major health domains: biological, functional, psychological and social.<sup>10</sup> Actual forms of CGA may vary depending on a current geriatric program, resources and logistics, but main goals remain the same. Modern experience with CGA in oncology has its roots in the mid-1990s, when oncologists and geriatricians made attempts to implement CGA in clinical practice.<sup>10</sup>

The complexity of CGA lies in its holistic approach<sup>11</sup> and the interaction between health domains. This approach requires the team to recognize the problems of a senior adult and prepare a treatment and supportive care plan.<sup>10</sup>

The question is: how, for whom and when to use CGA and if there is any equally valid alternative for this assessment?

### 4.2. What does CGA consist of?

CGA assesses main health domains. In every tested domain, many tools were developed and validated for evaluation of each important aspect of senior's condition. An assessment of the *physiological status* is of extreme importance for planning of the individual, tailored treatment for older patients. Aging is linked to the changes in liver, renal and bone marrow functions. Changes in the cytochrome p45 function may potentially affect drug pharmacokinetics,<sup>12</sup> as well as lower the level of albumin. It has been shown that the albumin level is an indicator of organism's reserves and an independent mortality risk factor.<sup>13</sup> Similarly, a low level of hemoglobin correlates with a higher mortality in older persons.<sup>14</sup> Toxicity of treatment also depends strongly on renal function. It is widely known, that the creatinine level does not properly reflect the renal function in the elderly, as normal values of this parameter do not exclude renal impairment. The best way to properly assess the renal function and its real reserve is to measure creatinine clearance.

Low levels of hemoglobin and albumin are also predictors of mortality and influencers of treatment outcome. SIOG task force on CGA recommends integration of biochemical markers, such as albumin and hemoglobin levels and creatinine clearance as vital elements, into an assessment of the tolerability of planned treatment in the elderly.<sup>5</sup>

The influence of *comorbidities* on physiological status cannot be omitted as many of them affect the cardiac and renal functions. The most often reported comorbidities in older patients are related to cardiac and respiratory diseases. In daily life, physicians can score the influence of comorbidities using Charlson Comorbidity Index (CCI).<sup>15</sup> This test has proved its clinical value, e.g. it has been demonstrated that hypertension can lead to the intensification of side effects of taking trastuzumab and anthracyclines, in the form of cardiomyopathy.<sup>16–18</sup>

Comorbidities lead to *polypharmacy*. Many medicines interact with cytostatics or other agents used in oncological treatment, bringing the risk of unexpected and potentially serious adverse effects. A helpful tool in the evaluation of potential drug toxicity is the Beers list, containing a list of drugs which are potentially toxic for older patients<sup>19</sup> as well as the Medication Appropriateness Index (MAI) which may be useful to measure appropriateness of prescription and optimize pharmacological treatment.<sup>20</sup>

Functional status evaluation is a very important part of CGA. The Activity Daily Life Scale (ADL)<sup>21</sup> and Instrumental Activities of Daily Living Scale (IADL)<sup>22</sup> are assessment tools which are most often used in functional assessment and incorporated into CGA. It has been shown that the need of assistance in ADL and IADL is a predictor of mortality in the population of elderly cancer patients.<sup>23</sup>

Similarly, *malnutrition* can negatively affect treatment results. ECOG analyzed a group of 3047 patients and demonstrated that weight loss before the start of chemotherapy had a negative impact on survival.<sup>24</sup> Malnutrition is the problem in about half of elderly patients. Nutrition status has to be taken into account before treatment and then assessed on a regular basis during treatment. Nausea and mucositis, loss of appetite and sense of taste result in food aversion which may lead to malnutrition, and dehydration with subsequent electrolyte imbalance, hypoalbuminemia and anemia. Instruments for assessment of nutrition status such as the Malnutrition Screening Tool (MST),<sup>25</sup> Malnutrition Universal Screening Tool (MUST)<sup>26</sup> or Nutrition Risk Screening (NRS)<sup>27</sup> are easy to use in daily practice. The most popular test is the Mini Nutritional Assessment (MNA)<sup>28</sup> or its Short Form (MNA-SF).<sup>29</sup>

*Psychological and cognitive impairment* are often underestimated in clinical evaluation. Clinicians are not prepared to assess properly the psychological status of elderly patients. The problem is important in the light of the fact that up to 20% of people over 65 years suffer from depression.<sup>30</sup> Psychological impairments like depression, delirium or dementia lead to the loss of appetite, malnutrition and low treatment compliance. Scales to evaluate mental status of older patients are well known, e.g. a general scale: Mini Mental State Examination test (MMSE) and the more specialized Hospital Anxiety and Depression Scale (HADS)<sup>31</sup> and Geriatric Depression Scale (GDS), mostly used by geriatricians.<sup>32</sup>

Social worker is a very important member of a treatment team as the *social and economic status* of senior adults is often ignored by physicians. Older patients experience loneliness and are in need of emotional support as well as financial assistance. To recognize and address their needs, special tests are included in CGA. Good examples of such tools are: Medical Outcomes Study Social Activity Limitations Measure (MOS)<sup>33</sup> and Medical Outcomes Study Social – Support Survey: Emotional/Information and Tangible Subscales. These tests can also be easily used in daily practice, not only in the CGA framework.

#### 4.3. A concept of frailty

CGA assessment allows to divide patients into three groups: fit, intermediate or frail.<sup>39</sup> There are few definitions of frailty in the literature. Frailty was generally defined by the American Medical Association as a condition present in a group of patients with the most complex and challenging problems, with higher probability of mortality and hospitalization.<sup>40</sup> Decrease of nutrition, mobility, strength, energy and physical activity are five hallmarks of frailty according to Fried.<sup>41,42</sup> Currently, also mood and cognition impairments are recognized as additional features of frailty.<sup>43</sup> Frailty can also be caused

by cancer itself – making patients weak due to cachexia or dependent due to pathological fracture or pain

Recognizing frailty is one of the most important tasks of geriatric assessment, because it allows to detect patients with low physical reserves among relatively fit seniors. Such patients need initial adaptation of treatment plan, as they are experiencing higher toxicity of treatment affecting results of the treatment.

#### 4.4. Quality of life (QoL)

Assessment of quality of life in elderly cancer patients is another important aspect of senior's condition. Quality of life is defined by WHO as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns."<sup>34</sup> QoL can be affected not only by aging itself, but also by cancer and treatment related toxicity.

Evaluation of QoL according to a WHO definition is subjective, thus results of this self-reported test can be different from physician's examination and detect health problems not captured by other tests. A good example of QoL questionnaire is the elderly module of EORTC, QLQ-30, designed and validated by the European Organization for Research and Treatment of Cancer (EORTC).<sup>35</sup> This questionnaire is widely used in daily practice and focused on different domains of life. Wedding et al. reported that for elderly patients diagnosed with cancer, quality of life seems to be even more important than gain in survival after treatment.<sup>36</sup> Moreover, impairments in CGA tests are related to decreasing of QoL measured by a HRQoL (Health Related Quality of Life) questionnaire.<sup>36</sup> Many studies have shown that repeating QoL tests during the course of treatment can be a valuable tool not only for tailoring treatment for seniors<sup>37,38</sup> but also as a predictor of survival.<sup>36</sup>

## 5. Discussion

A Complex Geriatric Assessment allows for identification of geriatric problems which are often missed in standard clinical examination and for evaluation of benefits and risks of standard treatment in the elderly. It allows a MDT for adaptation of planned treatment. Caillet et colleagues demonstrated that an initial treatment plan for patients at the mean age of 79.6 years was modified for 20.8% of patients after CGA. They found ADL dependence and malnutrition independently associated with adaptation to treatment of cancer in multivariate analysis.<sup>44</sup> Another study by Extermann showed that in early breast cancer in senior adults CGA repeated every 3 months discovered 6 health problems per patient which otherwise would not be detected.<sup>45</sup> Such difficulties like hearing and vision impairment, incontinence or dental problems, seemingly insignificant and easy to remove may affect results of treatment and quality of life. Thus, repeated assessment of elderly population should be of interest for every oncologist and geriatrician. How and when to re-evaluate senior patients still needs to be determined. Oncologists' community is aware that geriatric assessment must be incorporated widely into everyday clinical practice. Despite this knowledge, full geriatric assessment of every patient older than 65 years remains

a challenge for a busy oncological department. Due to the complexity of CGA, there is a need of short and simple screening tools, which would allow for identification of frail and vulnerable patients who need full CGA before treatment. Such a two-step approach is recommended by SIOG. Screening tools consisting of a combination of clinical tests in different health domains are currently under clinical validation<sup>46</sup> in order to find a most sensitive, specific and simple instrument.

To implement a holistic health care for senior adults with cancer some of cancer centers have developed special programs for older patients. A good example is the Moffit Cancer Center and its Senior Adults Oncology Program (SAOP).<sup>47,48</sup> The SAOPs team consists of physicians, nurse, dietitians, social workers and rehabilitation therapists. They are trained in oncology and committed to treatment of comorbidities linked to aging. The aim of the program is to make a comprehensive geriatric assessment by multidisciplinary team, to identify and treat seniors' problems related to cancer treatment, and quality of daily life. Dedicated tools for the calculation of treatment's toxicity, i.e. the Chemotherapy Risk Age Scale Age for High Risk Patients (CRASH)<sup>49</sup> are used by the SOAP for treatment decision making and adaptation. The development of such programs inside cancer centers seems to be a right way to optimize organization of health care for older patients and to treat cancer in a proper way, with time and attention for the patient and her/his needs.

## 6. Conclusions

Assessment of health status of senior adults with cancer is one of the most important tasks in a treatment decision-making process. CGA is recommended as a clinically validated gold standard in health status assessment. Despite its value, CGA seems to be a time- and manpower consuming procedure, which encourages oncologists and geriatricians to develop shorter screening tools to replace a full CGA.

The best way to improve treatment and care for elderly with cancer is implementation of institutional programs of holistic care for this group of patients.

## Conflict of interest

None declared.

## Financial disclosure

None declared.

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