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Does my older cancer patient have cognitive impairment?

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ABSTRACT

Cancer and impaired cognition are both frequent conditions in old age and consequently coexist to certain degree. The prevalence of impaired cognition increases sharply after the age of 65 and the more advanced form of cognitive impairment; dementia, is exceeding 30% by the age of 85 years. Adequate cognition is crucial for understanding important facts and for giving consent for intervention. There are many different stages of cognitive impairment, ranging from subjective cognitive impairment to severe dementia. The mildest stages of cognitive impairment are sometimes reversible but in more severe stages, there is brain damage of some kind, most frequently caused by neurodegenerative disorder such as Alzheimer's disease. Therefore, some kind of evaluation of cognition should be offered to all older individuals with cancer and in need for intervention. In this evaluation, information should also be sought from a close relative. In the earlier stages of cognitive impairment, the individual usually retains ability to give consent and understands information given but in later stages of dementia, a surrogate decision maker is needed. In milder stages of dementia, an individual evaluation is needed for decision of capability for consent. A specific diagnosis of a disorder such as Alzheimer's disease does not in itself preclude the individual from giving consent, the degree of cognitive impairment, impaired judgement and poor insight are more decisive in this regard. It is also important to know the difference of delirium, most often a time limited condition and dementia that usually is progressive.

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1. Introduction

Cognition, or higher cortical function, is an umbrella term for various human abilities such as memory, language, executive function and praxis. Cognitive abilities are highly individual in adult life, which should be taken into account when evaluating if impairment has occurred. It is also important to acknowledge individual variability in milder stages of cognitive impairment but in the more advanced stages, dementia, individual variability decreases. The prevalence of cognitive impairment increases with age but differs from study to study based on the population studied and the tools used for evaluation. Most epidemiological studies have focused on dementia which is the most advanced stage of cognitive impairment, and in a review by Jorm et al. [1] it was found that the prevalence of dementia increases twofold for each five years of age from 65 to 85 years when it reaches more than 30%. Even though recent studies have shown some decrease in prevalence [2], cognitive impairment and dementia are very prevalent conditions in old age.

The incidence of cancer is also high in older age. According to Cancer Research UK, the incidence peaks at the age range of 65–69 years and is almost at the same level until the age of 80 [3]. It is therefore evident that cancer and cognitive impairment frequently co-exist in older age. On top of that, the burden of cancer and cancer treatment can easily lead to impairment in cognition, causing confusion or delirium, even

though it does not per se cause dementia. Some kind of cognitive evaluation in older patients with cancer should therefore be offered and this has gained increased attention in the literature [4].

When categorizing cognitive impairment, it is helpful to use a staging system and as an example the Global Deterioration Scale (GDS) [5] is used here, a simple staging scale which crudely divides the condition into seven stages from normal condition (stage 1) to very severe dementia (stage 7) (Table 1).

2. The Different Stages of Cognitive Impairment

The mildest stage of cognitive impairment, Subjective Cognitive Impairment (SCI, GDS stage 2) does not cause practical problems for the individual. At this stage, the person experiences some difficulties in memory, language or other aspects of cognition but he or she is coping well and family members are not confirming that any change has occurred. SCI has a multitude of causes, many of them temporary but this is also the earliest stage of neurodegenerative disorder.

The next stage, Mild Cognitive Impairment (MCI, GDS stage 3) is defined as a condition with memory impairment (or other cognitive changes) that is experienced by the individual and a close relative confirms, but there is no dementia [6]. The individual uses various coping mechanisms such as a calendar for daily tasks and avoids complicated situations, but the person is independent. Many of those seeking help for cognitive impairment are in this stage and MCI is getting increased attention by the research community as irreversible brain

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Table 1
Global Deterioration Scale for Assessment of Primary Degenerative Dementia (GDS) [5].

Diagnosis	Stage	Signs and symptoms
No dementia	1 No cognitive decline	The person functions normally, has no memory loss, and is mentally healthy.
No dementia	2 Subjective cognitive impairment (SCI)	This stage is used to describe normal forgetfulness associated with aging; for example, forgetfulness of names and where familiar objects were left. Symptoms are not evident to loved ones or the physician.
No dementia	3 Mild cognitive impairment (MCI)	This stage includes increased forgetfulness, slight difficulty concentrating, decreased work performance. People may get lost more often or have difficulty finding the right words. At this stage, a person's loved ones will begin to notice a cognitive decline.
Dementia	4 Early dementia	There are difficulties in concentrating, decreased memory of recent events, and difficulties managing finances or traveling alone to new locations. People have trouble completing complex tasks efficiently or accurately and may be in denial about their symptoms. They may also start withdrawing from family or friends, because socialization becomes difficult. At this stage a physician can detect clear cognitive problems during a patient interview and exam.
Dementia	5 Moderate dementia	There are major memory deficiencies and a need for assistance to complete their daily activities (dressing, bathing, preparing meals). Memory loss is more prominent and may include major relevant aspects of current lives.
Dementia	6 Severe dementia	The individual requires extensive assistance to carry out daily activities, forgets names of close family members and has little memory of recent events. Many people can remember only some details of earlier life. Incontinence (loss of bladder or bowel control) is a problem in this stage. Ability to speak declines. Personality changes, such as delusions (believing something to be true that is not), compulsions (repeating a simple behavior, such as cleaning), or anxiety and agitation may occur.
Dementia	7 Very severe dementia	People in this stage have essentially no ability to speak or communicate.

changes are limited at this stage and if progression of cognitive impairment could be halted at this stage, the individual would benefit greatly. The individual is legally competent at this stage and is able to understand information given and to make decisions when asked to sign consent forms for medical or surgical intervention.

Dementia is defined as loss of intellectual abilities, such as memory capacity, that is severe enough to interfere with social or occupational functioning [7]. The first stage of dementia (GDS stage 4) is reached when the individual needs assistance and/or direct help with complicated tasks of daily life such as cooking, going to the store, using a computer and using the remote on TV, but is still able to take care of basic activities. When evaluating cognitive impairment, earlier abilities need to be considered. For example, a male that has never cooked in his life has thus not deteriorated in that skill even though he is unable to do that now. At this stage most individuals are legally competent but their abilities to communicate and to properly understand complicated information is often weakened and important information given to them might be difficult for them to comprehend. Accordingly, they need help to properly understand the meaning of consent in therapy. An individual approach to evaluate this ability is needed and information and help from a close relative is usually required to make a proper judgment.

In moderate and severe stages of dementia (GDS stages 5, 6 and 7), the person is generally not able to understand important information nor able to make proper decisions about his or her treatment and a legal guardian is needed. The individual should however be involved in any decision to the extent possible.

3. Causes of Cognitive Impairment

The most prevalent cause of dementia is Alzheimer's disease. This is a neurodegenerative disorder that seems to start many years before symptoms arise and in the earliest stages, the symptoms are very vague. Today, most persons with Alzheimer's disease are diagnosed in the early stage of dementia or even in the stage of MCI when the diagnosis needs to be based on biomarkers in addition to clinical evaluation [8]. Widely accepted biomarkers are changes in Beta-amyloid and tau protein in the cerebrospinal fluid (CSF), changes in Positron Emission Tomography (PET) scanning of the brain or evaluation of atrophy of the medial temporal lobes of the brain on Magnetic Resonance Imaging (MRI) [9]. It is however important to know that a diagnosis of Alzheimer's disease will not necessarily make the person unfit to give consent to intervention or treatment. The stage of the disease is decisive in this regard and to some extent the type of impairment.

Other less frequent neurodegenerative disorders that cause dementia are Lewy Body Dementia (LBD), and frontotemporal dementia (FTD). There are special features of these disorders that merit attention when

considering ability to consent. LBD is often closely linked to Parkinson dementia but some patients with LBD have subtle or hardly any extrapyramidal (Parkinson) signs and may be difficult to diagnose. Other major symptoms of LBD are visual hallucinations and fluctuation in cognition with intermittent confusion frequently occurring [10]. These patients often experience delirium post operatively or during a difficult treatment such as with cancer medications. On the other hand, they often have quite lucid periods during which their cognitive abilities are not greatly impaired, at least not in the early stages.

In FTD, the personality itself is often affected and the person's ability to make sound judgments is impaired even at early stage of the disease [11]. As this is the case early in the disease the simple diagnosis of FTD makes the person unable to consent and a close relative or a legal guardian should always be involved.

4. Evaluation of Cognitive Impairment

It is not unusual for a patient with dementia to be described as lucid and oriented in some situations such as in an emergency department or in other brief clinical encountering when there is generally a short time to cognitively evaluate individuals. In early dementia the individual usually retains normal skills of communication and cognitive impairment might easily escapes attention. As cognitive impairment is frequent in old age some assessment of cognition should always be performed prior to asking for therapeutic consent. For this purpose, well-validated and short cognitive tests are available. The most frequently used one is the Mini Mental State Examination (MMSE) that has been translated into many languages [12]. Currently, there are many different versions but of note is that the original one is subject to copyright [13]. The test usually takes 5–10 min to administer. The test is an evaluation of global cognition but some important parts of cognition are not covered by the test, insight and judgment being the most important ones. Another simple global test is the Montreal Cognitive Assessment (MoCA) [14]. The MoCA is a brief screening tool for mild cognitive impairment and is more detailed than the MMSE and takes a little more than 10 min to administer. It has been translated and validated in many languages [15] but there is the same caveat as for the MMSE, not evaluating insight and judgment. Another simple test is the clock drawing test which only needs a white paper and a pen. Different rating scales are available but the simplest one is the Schulman rating scale, which gives 0 to 5 points [16]. This test can show visual-spatial inabilities, apraxia and to some extent frontal lobe derangement. Apart from direct cognitive evaluation, the examiner needs to assess the patient's ability to understand the choice at hand, risks and benefits and to rationally apply that information to his or her own situation in order to make a decision. In addition it is also important to discuss with a close

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