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Systematic assessment of frailty

PERSPECTIVES

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A patient who is classified as frail is at high risk of post-surgical complications, nursing home admission, and of death. An assessment of patient frailty provides a more accurate picture of the patient's individual vulnerability than age and multimorbidity alone, and is therefore a useful aid in making clinical decisions in hospitals.

In research and clinical practice, older patients are increasingly classified according to their level of frailty, and this has become particularly relevant in the context of the COVID-19 pandemic. In its COVID-19 rapid guideline, the British National Institute for Health and Care Excellence recommends that all patients over the age of 65 with COVID-19 be classified with the aid of the Clinical Frailty Scale (CFS) (1). On 18 March 2020, the Norwegian Society for Geriatric Medicine also published a recommendation that older patients with COVID-19 should be classified according to this scale (2).

Frailty - what is it?

There is no consensus on how to identify frailty in the individual patient. When a person ages, the reserve capacity of most of their organs, such as the heart and kidneys, becomes reduced (3). With increasing age there is a rise in the incidence of diseases, use of medication, malnutrition, muscle weakness and impaired physical and cognitive function. The variation in physiological reserves across individuals also widens with increasing age, and a patient who is fit will have greater reserve capacity than a frail one (4).

Frailty can be understood as a physical phenomenon that only partly overlaps with multimorbidity and functional decline, with walking speed, sarcopenia (loss of muscle mass and strength) and weight loss as key factors (4). In clinical practice it is common to measure the level of frailty on the basis of a number of risk factors. These include comorbidity, use of medication, nutritional status, certain blood tests, and physical, emotional and cognitive function.

The specific pathophysiological mechanisms that lead to frailty are not fully understood. Biological ageing processes take place throughout life, with loss of neurons from the brain and loss of organ elasticity. Studies show that malnutrition and sarcopenia contribute to frailty, and that inflammation and pro-inflammatory cytokines can affect frailty, either directly by promoting protein breakdown, or indirectly by altering metabolic processes (5). Frailty occurs when not just one, but several physiological mechanisms are impaired. The more physiological systems that lose their reserves, the greater the level of frailty.

> ***«Frailty increases with age, but not all elderly people are frail»***

Frailty is often seen in geriatric patients, and global epidemiological studies reveal that it is a common cause of morbidity and mortality in older people (6).

Frailty increases with age, but not all older people are frail. In Norway, approximately half of all persons in the age group 80–89 years receive home-based services, and in the age group 90 years and upwards, almost 90 % use one or more services (7). An estimated one quarter of all persons over the age of 85 are frail (8).

Frailty index

There are several tools for assessing frailty. Some assess only physical function, while others include cognitive function and multimorbidity (9). A good frailty assessment tool should identify the causes of functional decline and estimate how much reserve capacity the patient has, and thus be able to draw some conclusions about the risk associated with treatment, for example surgery.

Rockwood and Mitnitski's frailty index is one of the most robust tools for measuring frailty, and lends itself to use in geriatric outpatient or inpatient departments (10). This frailty index (11) is based on a geriatric assessment that surveys 48 deficits grouped under multimorbidity, use of medication, degree of self-sufficiency, nutritional status, physical, cognitive and emotional function and biomarkers. The scale was first launched in 2001 and was translated into Norwegian in 2019. Each deficit can score either 0 (deficit absent) or 1 point (deficit present). Totalling the number of points and dividing by the number of deficits scored generates a ratio describing the level of frailty. The higher the score, the greater the frailty. If the frailty index value is less than 0.1, the patient is classified as fit, while a score of over 0.4 indicates severe frailty (12, 13). A high level of frailty is a predictor of shorter life expectancy and greater risk of post-treatment complications (14). At least 30 of the deficits should be present in order for the frailty index score to be calculated (15), and the more points that are evaluated, the more accurate the assessment will be.

> ***«An important point in cases of acute disease is that patients must be scored on the basis of their degree of frailty two weeks prior to hospitalisation»***

Routine geriatric assessments are conducted of patients in geriatric in- and outpatient departments. In practice, most deficits in the frailty index will have been reviewed during a geriatric assessment, so calculating the index will entail little extra work. The score can also be used as a starting point for monitoring the patient's development.

Screening tool

The CFS (16) is recommended as a screening tool (17). This is a well validated tool that correlates with the frailty index. Given good training, the tool is simple for doctors and nurses to use. An important point in cases of acute disease is that the patient must be scored on the basis of their degree of frailty two weeks prior to hospitalisation (baseline functional level). The CFS consists of a scale from 1–9 with a written description of the different levels accompanied by an illustration. A score of 1 describes a very fit patient, while a score of 9 means the patient is terminally ill. This tool is increasingly being used in intensive care environments and has received particular attention during the COVID-19 pandemic. The National Institute for Health and Care Excellence also recommends using the CFS for patients over the age of 65 with COVID-19, as a means of assessing whether they could profit from intensive care treatment (1).

For patients without COVID-19 receiving intensive care treatment, a CFS score of > 5 will be associated with 40–60 % 30-day mortality (18–19). During the COVID-19 pandemic, studies of the CFS have yielded differing results. Owen et al. included 1071 patients, and demonstrated that as a predictor of mortality for patients with COVID-19, the tool does not function as well as has been seen in earlier studies (20). However, Hewitt et al. showed a linear relationship between scores on the CFS and survival in 1564 patients (21). There is

speculation as to whether the cause of high mortality among older patients with COVID-19 is frailty that is accelerated over a period of days rather than years due to a violent cytokine storm that elicits an uncontrolled cytokine response and multiple organ failure (22, 23).

Why is it important to assess frailty?

Systematic assessment of frailty in older patients who are hospitalised offers a number of advantages. First, it will draw increased attention to the concept of frailty. This is important, because frail patients are at greater risk of negative events and need appropriate assessment and therapy. Second, a systematic assessment of patients might reveal areas that can be optimised, such as multimorbidity, polypharmacy and nutritional status. A broad-based assessment could also identify patients' strengths – for example patients with multimorbidity who nonetheless have a high functional level, or patients who manage without assistance in everyday life despite reduced mobility.

> ***«The assessment could help to determine whether there is a potential for improving a patient's functional level or quality of life by employing a specific type of therapy»***

Frailty assessments are a useful aid in decisions about treatment level, both to prevent under-treatment of fit elderly patients, but also to avoid over-treatment of those with severe frailty. The assessment could help to determine whether there is a potential for improving a patient's functional level or quality of life by employing a specific type of therapy. When establishing the status of patients with severe aortic stenosis who are being assessed for catheter-based implantation of an aortic valve, we are concerned with two things in particular: If the patient is severely frail mainly owing to the aortic stenosis, they may benefit from a new valve. If, however, their level of functioning is dominated by other factors, such as severe dementia, severe pulmonary disease or greatly reduced functional status, the treatment might do more harm than good.

Frailty can fluctuate

When interpreting both the frailty index and the CFS, it is also important to be aware that frailty can fluctuate. Some aspects of frailty are reversible, while others are progressive. Therefore we cannot use either the frailty index or the CFS alone when choosing treatment.

Take, for example, an 80-year old patient who is admitted with delirium triggered by severe pneumonia. In the acute situation the patient may appear very frail. The degree of frailty 14 days prior to hospitalisation will provide a picture of the patient's baseline functional level. If frailty assessments are based

only on how patients present during acute illness, they may be deprived of a treatment they would probably have benefited from, for example if antibiotics are withheld because the patient appears severely frail.

Conclusion

Assessing the level of frailty of older patients in hospitals is a useful aid in making clinical decisions, and should therefore be conducted systematically. This assessment makes individualised therapy possible, reveals areas that can be optimised and is an aid to finding the correct treatment level. The CFS can be used for screening, and in many cases it is useful to continue with a broad-based assessment tool such as the frailty index.

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