

## Introduction

# Preoperative risk evaluation in patients over 75 years candidates to non-cardiac and cardiac surgery

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In the 24<sup>th</sup> and 25<sup>th</sup> of June 2016, 80 national experts were invited in Rome from the Italian Society of Geriatric Cardiology and the Italian Association of Cardiovascular Prevention and Rehabilitation to revise the current knowledge on the perioperative risk in the elderly. Cardiologists, geriatricians, heart and general surgeons and anesthesiologists discussed the topic with the objective of reaching a consensus and to launch observational research and registries in the field of perioperative risk evaluation in the elderly.

The introduction of objective measures of frailty on top of traditional cardiac evaluation in the different surgical contexts could allow for a more precise definition of “surgical risk”, appropriate perioperative management and postoperative outcome.

In Western Countries population is rapidly aging. Based on ISTAT (Italian National Bureau of Statistics), Italy has 6,828,610 individuals who are aged over 75 years, corresponding to 11% of the total population, and more than 4.7 million elderly aged between 75 and 84 years, representing as much as 7.8% of the total population. The group of the “oldest old” (aged ≥85 years) comprises more than 1.9 million individuals, corresponding to 3.2% of the total population living in Italy. The category of the “oldest old” is the one showing the greatest increase over the years, passing from 3.5% (of the >65 years of age) in 2010 to 5.2% in 2016.

Cardiologists often face a variety of problems connected with aging, which are the reasons why the elderly have been systematically excluded from clinical trials: evidence-based treatment and Guidelines are often lacking and management becomes more complicated. As an example, cognitive impairment is an independent variable of worse

prognosis and is present in 10% of the people over 65 and in 40% of people over 80 years.

Recent Guidelines recommend standardized management protocols for elderly patients undergoing surgery and diverse strategies have been proposed for assessing the preoperative risk in the more advanced ages. Also in Italy, several studies have documented the impact of elderly age on non cardiac and cardiac surgery and, in particular, the problem of comorbidities, frequently coexisting.

The multimorbidity status (more than 2 coexisting conditions) affects negatively, in the vast majority of the elderly, the occurrence of repeated hospital admission, disability and death. Often, therapeutic decisions and subsequent results are affected by presence of renal insufficiency or neoplastic pathology, which could either be affected negatively by treatment or limit the life expectancy. In this paper, Simona Giampaoli (National Institute of Health) reports the prevalence of chronic diseases in the Italian population.

Often in the elderly with comorbidities, therapeutic decisions are guided by patient’s choices, the interpretation of evidences, prognostic considerations, clinical feasibility, and the opportunity to optimize the treatment. It has been shown that an aggressive treatment in the management of elderly, both in real world practice and in observational studies, is more rewarding in terms of NNT (Necessary Number of patients to be Treated to achieve a clinical benefit) as compared to the younger age group. Nonetheless, because many people over 65 have been excluded from the trials, along with the lack of firm clinical evidence, they run the risk not to receive adequate treatment both in the acute setting and in the treatment of their chronic condition.

The psychological prejudicial standing according to which chronological age is a limit in prescribing the appropriate treatment is called “ageism”, which is the attitude that discriminates and under-privileges the elderly, beyond the objective risk connected to the age in terms of possible drugs adverse reactions or clinical intervention.

In the last 25 years, the number of patients older than 75 years candidate for surgery has greatly increased due to the exponential rise in the elderly population, and has been accompanied by an increase in the risk of frailty. Frailty is defined as a clinical condition characterized by the presence of a state of reduced physiological reserve and a greater vulnerability to stressors. In the elderly patient, frailty is significantly associated to an increased risk of adverse events, functional decline, procedural complications, prolonged hospitalization and mortality. The correlation between frailty and the increase in mortality and morbidity necessitates an appropriate assessment tool to accurately quantify the clinical and perioperative condition of the patient.

Frailty has to be accounted for in the therapeutic decision making process: some parameters such as frailty index and the presence of cognitive deficit, must be part of the risk evaluation because they significantly impact on the postoperative outcome.

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The most common criteria to evaluate frailty are: *slow walking, weak handgrip, tiredness, limited physical activity, and unaccounted weight loss*. Patients with at least 3 of those elements present could be classified as frail and as such are more likely to suffer from repeated falls, permanent disability, repeated hospital admissions, and death, as compared to patients judged as not frail (“robust”).

Frailty has been found to have an important role as predictor of outcome in patients candidate to transcatheter aortic valve replacement (TAVR). In the randomized trial PARTNER, 31% of patients undergoing TAVR died during the first year after the procedure, indicating the need for better identifying patients who could have benefit in the long term from the procedure. After the PARTNER trial, frailty has been identified as one of the most important parameter predicting the outcome in the elderly population.

Over the past thirty years several indexes of perioperative clinical risk have been proposed. These scores have been based on multivariate analyses of observational studies that have linked the clinical characteristics of patients undergoing non-cardiac surgery with perioperative morbidity and mortality for cardiac complications. The scores developed by Lee (*i.e.* the Revised Cardiac Risk Index, RCRI), Goldman and Detsky showed well known values and limitations. Current preoperative assessment for cardiac surgery, such as the European System for Cardiac Operative Risk Evaluation II (EUROSCORE II) and the Society of Thoracic Surgeons (STS) risk score, are limited in their ability to predict perioperative outcomes in older patients. This is because patients’ chronological age should not be considered as the only tool to identify the surgical risk.

Recognizing frailty is important to predict the ability of a patient to overcome acute stress in surgery. Moreover it is also important to predict the patient’s future path since frailty is associated with multiple adverse health outcomes. Several reports, in recent years, have highlighted that frailty is progressively increasing in elderly subjects undergoing cardiac surgery. Recent studies analyzed a time span of about 10 years showing that the prevalence of frailty is more than doubled in this time frame. The same data highlighted that frail subjects have a perioperative mortality tripled, as well as a doubled risk to remain in intensive care unit for a period exceeding 72 hours and a four-fold increased risk of institutionalization in comparison to non-frail patients.

Current guidelines are unable to provide evidence-based recommendations for anesthesiologic approach of patients aged  $\geq 75$  years. The aim of guidelines is to help physicians to make safe decisions and formulate a management plan by using the latest evidence-based medical knowledge and simplify and/or eliminate unnecessary employment of resources.

In 2015, the American Heart Association, the American College of Cardiology, and the American Geriatrics Society together stated that only the results of large population-based studies and clinical trials, that include older patients representative of those seen in clinical practice, will provide the foundation for future evidence-based guidelines applicable to older people with CVD.

Notwithstanding these considerations, although there are no *specific guidelines* for the senior population, we can refer to guidelines and recommendations based on the available clinical evidence that can help the anesthesia care providers to assess the preoperative cardiovascular risk in adult patients and to design perioperative strategies that aim to reduce additional perioperative risks.

The increased need for surgery among the elderly have led to an increased absolute number of patients with Postoperative Delirium (POD). This has caused a relevant burden on both the patients and their families as well as on the health care systems.

POD is associated with increased morbidity, mortality and need for institutionalization. Very often, patients don’t recover previous brain ability, with severe consequences for both patients and society. Impact of POD is often aggravated due to both lack of knowledge and attention among caregivers involved in the process, from the indication for surgery till/to aftercare.

Preoperative evaluation should carefully search for predisposing factors in order to identify patients at higher risk. Preoperative anaesthesia consultation is probably the best moment for risk factors identification, however this task should be considered more as a “team goal” than a responsibility of a single operator. Gabriella Bettelli carefully examined this important item in the publication.

The relationship between testosterone deficiency (TD) syndrome and surgical resilience has a great impact in the modern approach to male elderly patients. Screening for low T should be mandatory in high risk groups candidate to surgery including those with diabetes, metabolic syndrome and obesity, even though benefits from T-treatment on survival rates are unclear.

The low-T3 syndrome, named non-thyroidal illness (NTI) that occurs during critical illness refers to a syndrome with different faces in both sexes. The acute stress or critical illness-induced alterations within the thyroid axis occur in the first days of critical illness *i.e.* post-operative period and are brought about at least in part by the concomitant macronutrient deficit. The NTI that occurs in prolonged critically ill patients or in post-surgical resilience patients who continue to be dependent on intensive medical care for weeks or months, may have an impact on surgical outcomes because of frequent occurrence of cardiac arrhythmias. Antonio Aversa and Andrea Fabbri treat this topic in their paper.

With the advance of technological progress and the increase in life expectancy, it is nowadays mandatory to define what is the “therapeutic limit”. Every day physician must take therapeutic decisions on the basis of their scientific knowledge, but also of own conscience and sense of limits. They cannot avoid to consider the global risk of death, disability and morbidity in more advanced age, especially in patients candidate to surgery. In these subjects, both fit or frail, is necessary not only a comprehensive evaluation for adequate risk assessment, but also a multidimensional geriatric assessment performed with advanced tools.

During the meeting the study protocol VALUTA-75 (*valutazione del rischio operatorio nei pazienti di età pari o superiore a 75 anni*) has been presented. The VALUTA-75 study has been designed to verify if the integration of routine risk scores with a multidimensional geriatric assessment can improve the prediction of short- and medium-term in- and out-hospital outcomes (30 days, 6 months, 1 year) in a sample of elderly individuals candidate for non-cardiac surgery. In particular, the study will aim to verify if the measurement of global functional status with the Instrumental Activities of Daily Living (IADL) and Basic Activities of Daily Living (BADL) scales, cognitive status with the Mini-COG test, and physical performance with the Short Physical Performance Battery (SPPB) can give additive prognostic information concerning mortality and the appearance of major complications, both cardiovascular and non cardiovascular.

If VALUTA-75 will succeedw in producing the anticipated results, it will make a step forward in improving the care of elderly patients and the criteria of selection of patients eligible for surgery. The information obtained will be useful for the prevention of cardiovascular and non cardiovascular events, and will improve the clinical appropriateness and use of the available healthcare resources.

The present issue of Monaldi Archives Chest Disease represents the contribution the two scientific societies want to offer to the medical community in this rapidly changing field.