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Opinion

Telemedicine in very elderly patients affected by end-stage Heart Failure: Wishful thinking or real opportunity?

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Telemedicine is a network of computerization and telecommunication technologies that provides health care services to remote patients. There is increasing evidence that telemedicine interventions are associated with a reduction in hospital admission rates and mortality in patients with heart failure [1,2]. Still, the question of the real effectiveness of its use in very elderly patients remains open. It is a critical question because a significant part of these patients is made up of subjects belonging to this age group and elderly people represent a "frail" population with a high rate of co-morbidities, disability and recurrent re-hospitalizations.

Furthermore, in the current context of the COVID-19 pandemic, telemedicine has proven to be a valuable tool for managing a large number of patients, particularly in advanced age groups [3].

As part of the current "demographic transition" that is leading to the global aging of the population, there is a consequent increase in the prevalence of chronic diseases, like heart failure, whose prevalence increases with the increase in the number of elderly people [4]. It has heavy repercussions on the caregivers, that need constant support to manage frail patients, and a high economic impact, especially related to hospitalizations [5]. Additionally, end-stage heart failure is characterized by recurrent hospitalizations, deterioration of functional status, refractory symptoms - despite optimal therapies – and worsening of quality of life. Nevertheless, in the most significant part of patients with chronic end-stage heart disease symptom management and caregiver support, play a central role in the care process, and, often, hospitalization can be preventable. The management of this particular set of patients should be one of the principal prerogatives of Telemedicine Care, to reduce the rate of hospitalization and improve the quality of life of these patients [6].

In this context, telemedicine could offer new organizational models that allow the management of a significant problem with few resources, while still ensuring adequate medical and nursing assistance to the patient. Models should be implemented that envisage a telematics network between doctors, nurses, and patients with end-stage heart failure. By the tele-exchange of information, healthcare staff can detect signs or symptoms, that are warnings for decompensation of heart failure, they can give advice or change therapy, to maintain hemodynamic compensation and reduce the risk of new hospitalizations, preserving a satisfactory quality of life [7,8]. The prerequisites for the realization of this project are adequate caregiver support and the availability of technological equipment that can allow the realization of a telemedicine system. The availability of a Telemedicine Centre capable of welcoming a wide range of users, presence of nurses and doctors trained in telemedicine and heart failure. The obstacle is the lack of recognition and legislative support for telemedicine: especially

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for end-stage non-cancer disease, the role of telemedicine should be strengthened and emphasized, because it offers qualified remote assistance to patients who no longer benefit from hospital care. Although it greatly benefits patients and the healthcare system, it remains underused. In recent years, our Centre of Telemedicine has carried out numerous experiences of remote management of elderly patients, demonstrating since 2008 [9,10], how it was possible to significantly reduce the number of hospitalizations due to clinical destabilization [11]. More recent experiences have shown the possibility of an impact in the small local communities (*Project CastelCuore*) by creating synergies between our public Institute, social cooperatives, and municipal administration, with significant results, especially in caregivers' satisfaction

We have performed a new clinical management program for remote clinical assessment of elderly patients (> 80 years) suffering from advanced stage heart failure using a nursing telemedicine active surveillance applicative under physician supervision. We want to reinforce the concept that end-of-life patients should be managed with remote assistance models and these models. These models should have more scientific evidence and be included in the international guidelines.

In conclusion, concerning literature data and our clinical experiences, Telemedicine can represent a clinically adequate and economically sustainable response to the managing of very elderly patients suffering from Chronic Heart Failure.

The next step of our research program in this field will be to use artificial intelligence programs to support decision-making processes for managing these patients. Artificial intelligence has already proven to have a high impact on chronic disease outcomes, during the pandemic period, by driving new approaches to public awareness [12].

We are confident that the combination of the great potential linked to the use of artificial intelligence and the demonstrated efficiency of the new digital telemedicine systems, will complete the definitive consecration of this methodology as the best answer to the problems related to the management of elderly patients affected by heart failure.

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