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Short Commentary Open Access

Longevity: Big Data Comparison of Mortality in Older Adults Receiving Care in Nursing Homes or Their Own Home in Andalusia (Spain)

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Institutionalized dependent older adults represent a highly vulnerable group of the population, with high mortality as described in previous studies [1,2]. The Activities of Daily Living (ADL) level [3], cognitive impairment [4], hip fracture [5], cancer [6] and Chronic Obstructive Pulmonary Disease [7] are important risk factors of mortality in this population. Recent studies have also found an increased risk of death among institutionalized older adults than those that live within the community, adjusting for age, gender and clinical conditions [8,9].

In Spain, elderly dependents receive care through the Public System of Social Services. During the six-year period 2007-2012, more than two hundred thousand older adults (200,000) had received care in Andalusia, the Spanish region with the greatest number of people registered in this system. Through this system, the population receive care in nursing homes or in their own homes, according to their own preferences and their social and clinical conditions [10].

The creation of a big data set allowed us to validate in our elderly population some predictors of mortality and confirm the importance of care setting as a risk of death factor. To do this, we use clinical and social data taken from the Information System for Dependence and the Electronic Health Record. The date of death is obtained from the Deaths Registry of Andalusia and the data is cross-referenced with that of the National Deaths Register. With them, we performed a survival analysis and included the following variables: sex, age, ADL level, preferences (nursing home or home-based care), support network characteristics (assessment, consistency, frailty and risk of claudication) and clinical conditions (dementia, Alzheimer's disease, cerebrovascular disease, Chronic Obstructive Pulmonary Disease, hip fracture and cancer).

We analyzed data from 200,039 people, 71% women. The average age was 80 years. According to the results, the risk of death is lower for women (38% less than men), and increases by ADL level (1,3% higher for each additional point on ADL Scale), age (5% for each additional year of age), Chronic Obstructive Pulmonary Disease (29%) and cancer (42%). After adjusting these variables, we found that nursing home care increases 55% the risk of death compared to home-based care (Table 1).

Our results are consistent with previous studies. We found an elevated mortality of institutionalized older adults [2], and the greater risk of death in the residential care setting compared to home-based care [8,9]. The results also confirm that ADL level is a very powerful predictive mortality factor [3].

These findings highlight the importance of further understanding the mortality of the elderly in these two environments. Are there other variables that may help us explain this effect? On the one hand, it is necessary to explore whether the geriatric assessment and health care programs act as protective factors for mortality of older adults that live in their own homes [11-13]. In Andalusia, there are specific care plans for older adults in their homes such as the Telecare Service, the monitoring program after hospital discharged, the follow-up visits to chronic patients by nursing personnel, health examinations for those aged 65 and above, etc. Another point to address is the differential handling of chronic diseases in older people both within the community and in residential care. In Andalusia, the older adults living in their homes receive health care through the Primary Care professionals and in accordance with the clinical practice guidelines established for each care process. The evidence-based care takes part of the management objectives in the Andalusia Public Healthcare System. However, in residential care for dependent people, the healthcare depends on each provider, whether public or private. In accordance with the regulations established in the Public System of Social Services, each provider contracts the healthcare personnel and applies their own protocols for the care of the residents. The differential management of the chronic diseases may have a direct influence on mortality [8]. Besides, there are other clinical and health care predictive factors such as Body Mass Index [14], medications [8], use of health services [8] or preventive home visits [15], which should be analyzed.

On the other hand, not only health factors may be influencing the higher mortality in nursing homes. Variables such as relational autonomy [16], sense of coherence [17,18] or the role of the family [16] could have a protective effect when care is provided at home.

Our findings show that residential care increases the risk of death in dependent older adults compared to home-based care, controlling important variables such as sex, age, ADL level and key support network characteristics and clinical conditions. However, we must continue to study the mechanisms that result in care setting having this effect on elderly mortality.

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			HR	C.I. 95%	Sig.
Sex		Man	1		***
		Woman	0.62	0.60, 0.64	
Age		Years	1.051	1.048, 1.053	***
Activities of Daily Living level		ADL Scale score	1.013	1.012 ,1.015	***
Prefer to live in own home		[Yes]	1		
		[No]	1.01	0.92 , 1.11	
Support network	Assessment	Good	1		
		Fair	1.06	0.97 , 1.17	
		Poor	1.16	0.95 , 1.43	
	Consistency	Good	1		
		Fair	0.96	0.91 , 102	
		Poor	0.93	0.83, 1.03	
	Frailty	Low	1		
		Moderate	0.95	0.89 , 1.01	
		High	0.96	0.86, 1.07	
	Risk of failure	Low	1		
		Moderate	0.96	0.90 , 1.03	
		High	0.99	0.88, 1.11	
Clinical factors	Alzheimer's disease	[No]	1		
		[Yes]	0.97	0.91, 1.03	
	Cancer	[No]	1		
		[Yes]	1.45	1.23 , 1,72	***
	Cerebrovascular disease	[No]	1		
		[Yes]	0.95	0.88 , 1.03	
	Chronic Obstructive Pulmonary Disease	[No]	1		
		[Yes]	1.29	1.21 , 1.38	***
	Dementia	[No]	1		
		[Yes]	0.99	0.92 , 1.06	
	Hip fracture	[No]	1		
		[Yes]	0.97	0.78 , 1,20	
Care setting		Home-based care	1		
		Nursing home care	1.55	1.40 , 1.72	***

*HR: Hazard Ratio. Sig.: Statistical significance. Codes of significance: *** <0.001 ** <0.01 * <0.05*

Table 1: Mortality risk factors in dependent older adults.

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