



7th International Conference on Intercultural Education “Education, Health and ICT for a Transcultural World”, EDUHEM 2016, 15-17 June 2016, Almeria, Spain

## Comprehensive geriatric assessment of the nonagenarian population

Raül Sancho Agredano<sup>ab\*</sup>, Victoria Morín Fraile<sup>a</sup>, Joan Maria Estrada-Masllorens<sup>a</sup>, Eva Maria Guix-Comellas<sup>a</sup>, Jordi Galimany Masclans<sup>a</sup> & Mireia López Poyato<sup>c</sup>

<sup>a</sup> School of Nursing, Faculty of Medicine and Health Sciences, Universitat de Barcelona, L'Hospitalet de Llobregat, Barcelona, Spain

<sup>b</sup>GRIN, Bellvitge Biomedical Research Institute (IDIBELL), 08907 Barcelona, Spain

<sup>c</sup>CAP Les Corts CAPSBe

---

### Abstract

Our society is facing new economic, political, social and demographic challenges that will require health care services capable of responding to the population's growing health needs, especially chronic processes linked to ageing. Comprehensive assessment of the frail elderly people represents one of the most important matters in providing proper geriatric care in primary health care (PHC). A cross-sectional descriptive study was conducted on a final sample of 105 patients > 90 years of age cared for by a PHC team. 75.2% of the population were women. 17.1% of the population as a whole and 18.9% of women lived alone. Close to 40% of the population had experienced one or more falls. 65.7% were taking more than 4 drugs/day and approximately 50% had been properly vaccinated. On a cognitive level, the majority of the population suffered from mild decline, despite their advanced age. We must progress towards comprehensive, proactive and patient-centred care. Good comprehensive geriatric assessment coupled with good care from PHC teams provides elderly persons with a better state of health.

© 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee of EDUHEM 2016.

*Keywords:* elderly, frailty, comprehensive assessment, primary health care.

---

### 1. Introduction

Progressive population ageing leads to major economic, health care, familial, social and political repercussions. A sustained increase in life expectancy, a low birth rate and an improvement in health care services for the general

---

\* Corresponding author. Tel.: +0034- 934024242

E-mail address: [rsancho@ub.edu](mailto:rsancho@ub.edu)

population and older people in particular foster ageing (WHO 2012). In the case of Spain, this will furthermore be aggravated in the next 15-25 years when the so-called baby boomers reach retirement age (Abellan et al. 2014).

Owing to advanced age, which is accompanied by not only chronic diseases but also concomitant geriatric syndromes (falls, dementia, malnutrition, urinary incontinence, etc.), a large proportion of the people in this segment of the population require home care, and are furthermore considered to be frail persons (Clegg et al. 2013). Between 10-20% of those over 65 years of age are considered fragile, this percentage increasing when you consider those over 85 years of age who are the main consumers of health care resources, reaching more than 65% of health care costs (Imsero 2015).

Frailty is more closely linked to biological age than to chronological age (Wahlin et al. 2006) and is a difficult concept to define and delimit (Martin et al. 2010, Fairhall et al. 2008). However, Salgado proposed the following criteria (Salgado 1983): > 80 years of age, living alone, chronic condition involving a permanent functional disability, polypharmacy, hospital admission in the past 12 months, cognitive decline, etc. These criteria have allowed us to identify and include older people in a situation of greater risk and vulnerability in prevention and follow-up programmes (Christensen et al. 2009).

Frailty and vulnerability are a major health problem, including increased use of health services, increased risk of immobility, disability and death (Boyd et al. 2005, Woo et al. 2006).

At present, the care provided to the most elderly population is done on a daily basis with these situations of frailty, vulnerability, dependence and chronicity (Contel et al. 2012, Morales 2014). Furthermore, the basic coverage of services given to these patients is ensured, but it tends to be fragmentary and lack coordination and exchange of information between health professionals. This leads to a failure to identify many of these patients' health risks and care needs at a given time, which will hinder the success of our health care activities (Mayo-Wilson et al. 2014, Low et al. 2011). Primary health care must progress towards comprehensive care, where the role of the nurse and his or her competencies must increase, to generate a proactive change in nursing professionals, carers and above all patients themselves (Finnbakk et al. 2012, Sanchez-Martín 2014, Miguélez et al. 2014).

## 2. Objectives

General:

- To determine the functional and cognitive status of an urban population over 90 years of age cared for by primary health care (PHC) centres.

Specific:

- To determine socio-demographic variables and living arrangements.
- To determine and compare hearing status, visual status and falls experienced.
- To determine vaccine status, polypharmacy and toxic habits.
- To determine the number of admissions and their relationship to cognitive and/or functional status.

## 3. Methods

### 3.1. Study design and participants

A cross-sectional descriptive observational study was conducted at a Primary health care centre in the city of Barcelona. Patients were recruited by means of non-probabilistic convenience sampling over a period of 6 months (from December 2014 to June 2015). The entire population > 90 years of age recruited to be studied consisted of: 146 patients, of whom 14 were excluded owing to terminal disease and 27 were excluded as they proved unavailable. Thus, the final sample consisted of 105 patients.

### 3.2. Data collection

Assessment was carried out through a questionnaire collected by the research team consisting of nurses and based on the patient's medical record, the variables: sex, age, falls, loneliness, place of visit (home / health center),

polypharmacy, toxic habits, vaccination status (tetanus, pneumonia and flu), hearing and sight, hospital admissions, and proven and validated geriatric assessment scales: the Barthel index (Mahoney 1965), the Lawton and Brody index (Lawton 1969) and the Pfeiffer index (Pfeiffer 1975).

### 3.3. Data analysis

The data was recorded in a database created specifically in Microsoft Excel and analysed using SPSS software, version 18.0 statistical package. Qualitative variables were described in terms of proportions, calculating 95% confidence intervals. Quantitative variables were described using mean and median as measures of centrality and standard deviation and interquartile range as measures of dispersion. A p value below 0.05 was considered statistically significant.

### 3.4. Ethical considerations

Before inclusion in the study, written informed consent from patients was obtained, in agreement with Spanish regulations (Ley 42/2002 de Autonomía del Paciente).

## 4. Results

The population was 93.17 years of age on average. The proportion of women was 75.2% (79) and the proportion of men was 24.8%. No statistically significant differences were observed with respect to age or sex ( $p = 0.247$ ). 17.1% (18) of the population lived alone; this percentage increased to 18.9% for women. There were no statistically significant differences with respect to living arrangements, age ( $p = 0.316$ ) or sex ( $p = 0.382$ ). 60% of them are cared for at home, no statistically significant differences were observed with respect to age ( $p = 0.163$ ).

None of the individuals interviewed stated that they smoked, and only 3 of them stated that they used to smoke (2 men and 1 woman). 98.1% did not drink alcohol on a regular basis.

No statistically significant differences were observed with respect to sex for any of the three vaccines, with the following results:

Table 1

Vaccination status	
Vaccinated against all 3	49,5%
Tetanus	51,4%
Pneumonia	75,2%
Flu	80%

69 patients (65.7%) were taking more than 4 drugs (polypharmacy). No statistically significant differences were observed with respect to age ( $p = 0.298$ ) or sex ( $p = 0.0891$ ).

55.2% had some degree of hearing impairment. 62.9% had some degree of visual impairment. No statistically significant differences were observed with respect to sex ( $p = 0.273$ ) or falls ( $p = 0.951$ ). 39% of the individuals interviewed stated that they had not fallen at least once in the last 6 months.

Table 2. Geriatric assessment scales

	Score	Average score	Health condition	average men	average women
Barthel	100	76.62	Mild dependence	81.73	74.94
Lawton & Brody	8	3.83	Moderate dependence	3.96	3.78
Pfeiffer*	10	2.74	Mild decline	1.69	3.09

\* There were statistically significant differences with respect to sex ( $p = 0.025$ ).

17.1% were admitted to hospital during the study period. No statistically significant differences were observed with respect to sex, but statistically significant differences were observed with respect to cognitive status and Pfeiffer score ( $p = 0.006$ ) and with respect to functional status and Barthel score ( $p = 0.018$ ).

## 5. Discussion

Based on our results, which were consistent with those of other authors, it may be said that instrumental activities of daily living decline before basic activities do, and that therefore Lawton and Brody's scale is a good predictor of early functional decline and frailty (Millán-Calenti et al. 2010, Gold 2012, Ichazo et al. 2004, Arnau et al. 2012), and the Barthel index is a good predictor of mortality (Arnau et al. 2012, Torres et al. 2009).

The falls have an important predicting role of frailty. The fact that 39% of the patients studied suffered a fall leads us to thinking that their physical condition was not good, although after crossing the fall data with indices of functionality (Barthel and Lawton), we could not observe statistically significant relationship. Therefore, as in other studies, we can say that the falls are due to a conserved physical condition which allows them to move themselves, but that the loss of visual acuity and architectural barriers make them fall more easily (Lavedan et al. 2015, Cervantes et al. 2014).

Finally, it can be affirmed that comprehensive assessment of the frail elderly person represents one of the most important matters in providing proper geriatric care in PHC (Corrales-Nevaldo et al. 2012, Cervantes et al. 2014). With the changing global demographic pattern, our health care systems increasingly have to deal with a greater number of elderly patients, which is why good comprehensive geriatric assessment coupled with good care from PHC teams may provide elderly persons, especially such vulnerable groups as those over 90 years of age, with a better state of health (Ichazo et al. 2004, Contel et al. 2012).

We believe that the main limitation of the study was the fact that it was conducted in a non-institutionalised population, which might have led to an overestimate of functional and cognitive states of health, although there are already some studies stating that patients older than 90 years of age have low comorbidity, unlike the younger elderly (Cayuelas et al. 2013).

## References

- Abellan A., Vilches J. & Pujol R. (2014) "Un perfil de las personas mayores en España. Indicadores estadísticos básicos". Madrid, Informes Envejecimiento en red nº6. Ministerio de Economía y Competitividad.
- Ana Lavedán Santamaría\*, Pilar Jürschik Giménez, Teresa Botigüé Satorra, Carmen Nuin Orrio y Maria Viladrosa Montoy (2015) Prevalencia y factores asociados a caídas en adultos mayores que viven en la comunidad. *Aten Primaria*;47(6):367--375
- Arnau A., Espauella J., Serrarele M., Canudae J., Formiga F. & Ferrer M. (2013) Factors associated with functional status in a population aged  $\geq 75$  years without total dependence. *Gac Sanit* 26(5), 405–413.
- Boyd C.M., Xue Q.L., Simpson C.F., Guralnik J.M. & Fried L.P. (2005) Frailty hospitalization and progresión of disability in a cohort of disabled older woman. *Am J Med* 118, 1225-1231.
- Cayuelas L., Navarro M., Kostov B. & Sisó A. (2013) Baja comorbilidad en longevos. *Aten Primaria* 45, 330-2.
- Cervantes R.G., Villarreal E., Galicia L., Vargas E.R. & Martínez L. (2014) Estado de salud en el adulto mayor en atención primaria a partir de una valoración geriátrica integral. *Aten Primaria* 47(6), 329-335.
- Christensen K., Doblhammer G., Rau R. & Vaupel J.W. (2009) Ageing populations: the challenges ahead. *Lancet*. 374 (96), 1196-1208.
- Clegg A., Young J., Iliffe S., Rikkert M.O. & Rockwood K. (2013) Frailty in elderly people. *Lancet* 381, 752–62.
- Contel J.C., Muntané B. & Camp L. (2012) La atención al paciente crónico en situación de complejidad: el reto de construir un escenario de atención integrada. *Aten Primaria* 44(2), 107-113.
- Corrales-Nevaldo D., Alonso-barro A. & Rodríguez-Lozano M.A. (2012) Continuidad de cuidados, innovación y redefinición de papeles profesionales en la atención a pacientes crónicos y terminales. Informe SEESPAS 2012. *Gac Sanit* 26(S), 63–68.
- Fairhall N., Aggar C., Kurrle S., Sherrington C., Lord S., Lockwood K., Monaghan N. & Cameron I. (2008) Frailty Intervention Trial (FIT). *BMC Geriatrics* 8, 27.
- Finnbakk E., Skovdahl K., Blix E.S. & Fagerström L. (2012) Top-level manager's and politician's worries about future care for older people with complex and acute illnesses: a Nordic study. *Int J Older People Nurs* 7(2), 163-72.
- Gold D.A. (2012) An examination of instrumental activities of daily living assessment in older adults and mild cognitive impairment. *J Clin Exp Neuropsychol* 34(1), 11-34.
- Ichazo B., Vila J., Sancho R. & Alegre N. (2004) Valoració de dependencias y salud geriatric. *Atencion Primaria* 34 (9), 504-505.
- IMSERSO. Informe 2014. Las personas mayores en España. Datos estadísticos estatales y por Comunidades Autónomas.

- Lawton M.P. & Brody E.M. (1969) Assessment of older people: self-maintaining, and instrumental activities of daily living. *Gerontologist*. 9, 179-86.
- Low L., Yap M. & Brodaty H. (2011) A systematic review of different models of home and community care services for older persons. *BMC Health Services Research* 11, 93.
- Mahoney Fl. & Barthel D.W. (1965) Functional evaluation: the Barthel Index. *Md Med J* 14, 61-65.
- Martin I., Gorroñoigoitia A., Gomez J., Baztan J.J. & Abinaza P. (2010) El anciano frágil. Detección y tratamiento en AP. *Aten Primaria* 42, 388-393.
- Mayo-Wilson E., Grant S., Burton J., Parsons A., Underhill K. & Montgomery P. (2014) Preventive Home Visits for Mortality, Morbidity, and Institutionalization in Older Adults: A Systematic Review and Meta-Analysis. *PLoS ONE* 9(3).
- Miguélez A. & Ferrer C. (2014) La enfermera familiar y comunitaria referente del paciente crónico en la comunidad. *Enferm Clin* 24(1).
- Millán-Calenti, J.C., Tubío J., Pita-Fernández S., Gonzalez-Abrales I., Lorenzo T., Fernández-Arruty T. & Maseda A. (2010) Prevalence of functional disability in activities of daily living (ADL), instrumental activities of daily living (IADL) and associated factors, as predictors of morbidity and mortality. *Archives of Gerontology and Geriatrics* 50(3), 306–310.
- Morales J.M. (2014) Gestión de casos y cronicidad compleja: conceptos, modelos, evidencias e incertidumbres. *Enferm Clin* 24, 23–34.
- Pfeiffer E. (1975) A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *J Am Geriatr Soc* 23(10), 433-41.
- Salgado A. (1983) Geriatria. Historia, definición, objetivos y fines, errores conceptuales, asistencia geriátrica. *Medicine (Madr)* 50, 3235-9.
- Sánchez-Martín C.I. (2014) Cronicidad y complejidad: nuevos roles en Enfermería. *Enfermeras de Práctica Avanzada y paciente crónico. Enferm Clin* 24(1).
- Torres B., Núñez E., de Guzmán D., Simón J.P., Alastuey C., Díaz J., Corujo E., González M.D. & Fernández O. (2009) Índice de Charlson versus índice de Barthel como predictor de mortalidad e institucionalización en una unidad geriátrica de agudos y media estancia. *Rev Esp Geriatr Gerontol*. 44(4), 209-212.
- Wahlin A., MacDonald S.W., De Frías C.M., Nilsson L.G. & Dixon R.A. (2006) How do health and biological age influence chronological age and sex differences in cognitive aging: moderating, mediating, or both? *Psychol Aging* 21, 318-32.
- WHO. Bulletin of the World Health Organization. (2012) The health-care challenges posed by population ageing. 90 (2), 77-156. [on line]. Retrieved from <http://www.who.int/bulletin/volumes/90/2/12-020212/en/>
- Woo J., Goggins W., Sham A. & Ho S.C. (2006) Public health significance of the frailty index. *Disabil Rehabil* 28, 515-521.