SHORT COMMUNICATION

Geriatric syndromes in a centenarians population

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Abstract

Background Centenarians develop diseases later than younger populations.

Aims Assessment of geriatric syndromes in centenarians living in Marseille in 2020.

Methods Observational preliminary study describing centenarians living in the Marseille area, being part of the patients base of the general practitioners (GPs).

Results Twenty-two centenarians were enrolled, including seventeen women (77.3%). Thirteen centenarians lived in nursing homes (NH) and nine in private housing (PH). All were dependent for daily living activities and 78.9% used walkers to get around. GPs consultations were exclusively home visits (in NH or PH). Centenarians living in NH presented more cognitive impairments, more comorbidities, and fewer hospitalizations during the past year compared to centenarians living in PH.

Discussion Although centenarians represent a model of successful aging for society, all were dependent and had at least one geriatric syndrome.

Conclusions Maintaining centenarians at home requires technical aids and intervention of several professional caregivers relying on family support.

Keywords Centenarians · Geriatric syndromes · Nursing homes · Private housing

Introduction

In France, there was 20,944 centenarians in 2017 [1], mostly women, half living in private housing [2], and their number is expected to increase tenfold in the next fifty years. In centenarians, chronic conditions appear later than in younger old people, suggesting a lower susceptibility to diseases [3]. They represent a model of successful aging for society, but little is known about the number of years they live with severe disability or dependence requiring care. The objectives of this study were to describe and compare geriatric characteristics of centenarians living in private housing (PH) or in nursing homes (NH) in the Marseille area in 2020.

Materials and methods

Study design

This is an observational descriptive study lead in Marseille area from October 2020 to January 2021. It was approved by the National Committee for Informatics and Liberties, registration number 20–277. Eligible centenarians had to be registered on the practice list of general practitioners (GPs) collaborating with our geriatric unit and to be seen in consultation by participating GPs for a routine visit during the survey period. They could be living in PH or NH in Marseille area. Included centenarians agreed to the use of their health data in the study (Fig. 1).

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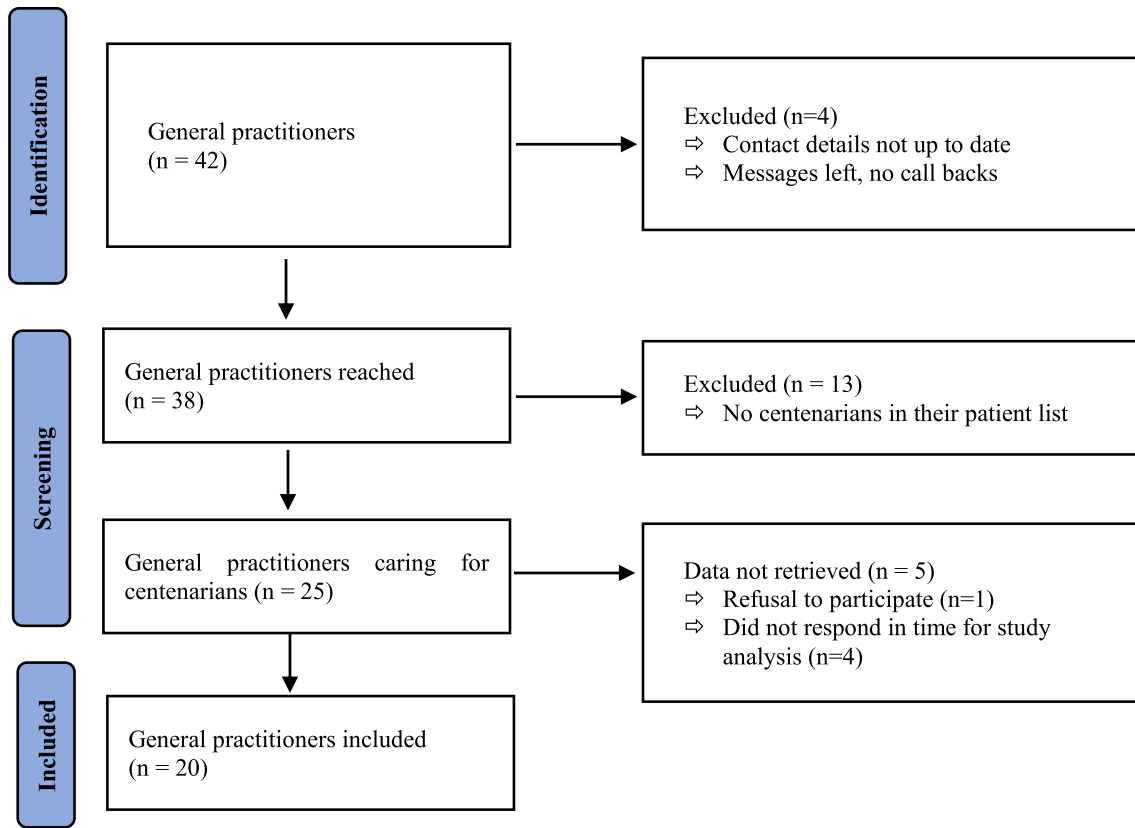4   CNRS, EFS, ADES, Aix-Marseille Univ, Marseille, France

Fig. 1 Flow chart

Data collection

Demographic and social data (age, gender, type of housing, professional or familial caregiver and their visit frequencies, place of GP consultation) were gathered. The detailed aid received by centenarians living in PH was collected (domestic help, nurses, physical therapists, technical help). Geriatric data were also collected from the GP medical records: Cognitive status (known history of cognitive disorders: Mini-Mental State Examination (MMSE) < 24 [4]); Autonomy (ADL: activity of daily living [5]; dependence if score < 6); treated depression, incontinence, mobility impairment (history of falls within one year or use of crutches or walker). Malnutrition was defined by a Body Mass Index (BMI) < 22 kg/m^2. Number of comorbidities were also collected as well as the number of drugs taken, the use of psychotropic drugs or sleeping pills. Polypharmacy was defined as the use of more than 5 drugs a day [6]. Unplanned hospitalization and emergency room (ER) visits within the past year were also assessed. Lastly, if possible, the data of the last biological analysis were collected. Anemia was defined as hemoglobin (Hb) level < 12 g/dL; renal failure as Cockcroft glomerular filtration rate < 60 mL/min; and hypoalbuminemia as albumin < 35 g/l.

Statistical analysis

The statistical analysis was performed using SPSS version 17.0 for windows. Continuous variables were presented as the median and interquartile range (IQR). Categorical variables were expressed as the number of patients and percentage. Univariable comparative analyses were performed in conformity with the Fischer or the Mann–Whitney test application requirement according to the categorical or continuous nature of the variable. The significance threshold considered for the analyses was $p = 0.05$.

Results

Descriptive analysis

This study included 22 centenarians, median age was 101 years (100–101), and seventeen were women. Nine centenarians lived in PH, thirteen in NH (Table 1). All centenarians had ADL impairment (median score 2.3 (1–4.1)).

Table 1 Comparative analysis of the 22 centenarians according to their living place

Characteristics	Total population		Nursing home (n=13)		Private housing (n=9)		p-value
	N or median	% or (IQR)	N or median	% or (IQR)	N or median	% or (IQR)	
Median age	101	(100–101)	101	(100–103)	100	(100–101)	0.071
Women gender	17	77.3	11	84.6	6	66.7	0.316
Autonomy							
Median ADL	2.3	(1–4.1)	1	(1–2)	4	(3.3–5.3)	0.0001
Incontinence	11	50	9	69.2	2	22.2	0.040
Comorbidity							
Median nb of comorbidities	5	(4–6)	5	(5–7)	4	(2.5–5)	0.028
Cognitive impairment	10	45.5	9	69.2	1	11.1	0.010
Depression treated	10	45.5	7	53.8	3	33.3	0.305
Iatrogenic risk							
Median nb of drugs	6.5	(5.0–9.3)	7	(5–10.5)	6	(3.5–8.5)	0.239
Polypharmacy (≥5 drugs)	19	86.4	13	100	6	66.7	0.055
Sleeping pills	9	40.9	8	61.5	1	11.1	0.031
Psychotropic drugs	11	50	8	61.5	3	33.3	0.193
Nutritional status							
Median BMI (kg/m^2)	22	(19.6–23.8)	22	(20.3–24.4)	22	(19.2–24)	0.664
Median albumin (g/L)[a]	36.5	(33.5–39)	33.7	(31.2–36)	39	(37.3–41.9)	0.003
Malnutrition (BMI < 22 kg/m^2)	9	40.9	5	38.5	4	50	0.472
Biological data (n=20)							
Anemia (Hb < 12 g/dL)	10	45.5	7	63.6	3	33.3	0.185
Renal failure[b]	14	73.7	9	81.8	5	62.5	0.336
Mobility							
Fall within one year[a]	16	80	10	90.9	6	66.7	0.217
Mobility with crutches[a]	4	20	2	18.2	2	22.2	0.625
Mobility with walker[c]	15	78.9	8	80	7	77.8	0.667
ER visit[a,d]	14	63.6	6	54.5	8	88.9	0.157
Hospitalization[a,d]	10	45.5	2	18.2	8	88.9	0.005
Assistance provided at home							
Domestic help	3	33.3			3	33.3	–
Home meal delivery	1	11.1			1	11.1	–
Remote alarm	2	22.2			2	22.2	–
Nurse[e]	8	88.9			8	88.9	–
Physical therapist[f]	9	100			9	100	–
Home visit once a day	1	11.1			1	11.1	–
Home visit 3 times/week	6	66.7			6	66.7	–
Home visit twice a week	1	11.1			1	11.1	–
Caregiver							
Familial	1	11.1			1	11.1	–
Professional[g]	2	22.2			2	22.2	–
Both	6	66.7			6	66.7	–
Visit once a day	5	55.6			5	55.6	–
Visit twice a day	4	44.4			4	44.4	–

ADL activity of daily living; *nb* number; *BMI* body mass index; *ER* emergency room; *nb* number

[a]Missing data n=2

[b]Renal failure defined as glomerular filtration rate < 60 mL/min

[c]Missing data n=3

[d]At least one in the past year

[e]Home nursing frequency is twice a day for drug management, vitals monitoring, dressing

[f]Physical therapy was dispensed at home except for one patient

[g]Professional caregivers do not include nurses or physical therapists

Median number of comorbidities was 5 (4–6) and 19 patients were prescribed more than 5 drugs. Ten centenarians presented a cognitive impairment. Nine centenarians were malnourished, median BMI was 22 kg/m^2 (19.6–23.8). The median numbers of ER visits and hospitalizations within the past year were, respectively, 1 (0–1.8) and 0.5 (0–1). None of the centenarians were visited in GPs medical office.

All centenarians living in PH had daily home support involving a minimum of two caregivers (familial or professional).

Comparative analysis

Table 1 summarizes the profile of centenarians according to their place of residence. Centenarians in NH had significantly more cognitive impairment, more prescriptions of sleeping pills and psychotropic drugs, and more polypharmacy than centenarians in PH. All were dependent for ADL but those residing in NH were significantly more dependent than those living in PH. There were significantly fewer hospitalizations within one year among centenarians living in NH, but the number of visits to the ER were not significantly different between the two populations.

Discussion

To our knowledge, this is the first study carried out on centenarians living in Marseille area, and their medical care. Our main finding was that all the centenarians analyzed had at least one geriatric syndrome, regardless of their housing conditions. Living in NH was associated with more severe physical dependence and cognitive disorders but less hospitalizations in the past year.

As expected, our analysis showed that the number of comorbidities was higher among centenarians in NH than among those living in PH. In a German study, the average number of comorbidities of centenarians was lower than that of nonagenarians and octogenarians (3.3; 4.3 and 4.6 respectively) [7]. Another study on German centenarians showed an average of 5.3 comorbidities and stated that all centenarians had "health issues" and that one third had more than five comorbidities [8], which is more comparable to our data. The late onset of the potential synergic effects of concomitant chronic diseases is probably one of the keys to successfully reach extreme ages.

In our study, 45.5% of the centenarians had cognitive impairment, 69.2% of those living in NH. In previous centenarian cohorts, prevalence of cognitive disorders varied from 58 to 68% [7, 9–11]. The lower prevalence of cognitive disorders in our study may be related to our limited sample size ($n = 22$) or the possible under-diagnosis of dementia in centenarians living in PH: the presence of cognitive impairment was reported in medical records but results of cognitive assessment could be out of date. Furthermore, cognitive status is difficult to assess with the MMSE in very old patients. Vision and hearing impairments, or depression that are frequent in this population may modify the MMSE and make it difficult to interpret [12]. This may explain why the MMSE has not been systematically repeated by GPs in their centenarian patients.

Polypharmacy was present in 86.4% of centenarians. In a Canadian cohort [9], the average number of drugs used by centenarians was 9.2 (of which 68% were psychotropic drug) but the proportion of centenarians with cognitive impairment was higher than in our study. A review of the literature analyzing the prevalence and the factors associated with polypharmacy in long term care centers [13] showed high variability of prevalence between studies, up to 91%, 74% or 65% of the residents being prescribed 5, 9 or 10 drugs, respectively. In our population, all centenarians living in NH had polypharmacy, the patients using less than five drugs were all living in PH. These results can be related to the greater number of comorbidities and higher prevalence of cognitive impairments, in patients living in NH.

The type of GP consultations by centenarians was also different from that of the "younger" population, as it took place exclusively in their residence (PH or NH). This population often presents mobility difficulties, and travel to the GP office is not considered an option. This population is also used to the medical practices of the beginning of the twentieth century, where GPs systematically consulted the patient at home. In our study, a large majority of centenarians used walking aid, and all were dependent in ADLs. These results imply the implementation of human and technical aids to allow the patient to remain at home. It should be noted, however, that despite the many home helpers, daily monitoring is more difficult to carry out at home, which could explain why there were more hospitalizations among centenarians living in PH than among those in NH, even though the latter had more comorbidities. Indeed, we cannot exclude the possibility of less access to hospitals for people in NH. However, the centenarians in our sample are followed by independent GPs who consult both in NH and PH, which probably limits the risk of inequality of access to hospital care.

A common feature of all studies on centenarians is the unequal distribution between men and women, with an over-representation of women who tend to outlive men [14]. Indeed, 77.3% of our population were women and the majority lived in NH. There were, respectively, 85.3%, 87.9% and 89% of women in the Canadian cohort [9] and the two German cohorts [7, 8]. The lower representation of women in our study may be related to the small sample size, but also to geographical particularities since the proportion of women among our centenarians in the south of France is close to what is observed among Italian centenarians (68.2%) [10,

11]. The over-representation of women among very old people has important implications in terms of adapting health and social services to meet their specific needs. Women are traditionally the natural caregivers of their partners, while the reverse is not always true. As a result, a higher proportion of women receive home care or live in NH. Women tend to outlive their male partners because they have a longer life expectancy and tend to marry older men [15]. A study explained the paradox of men and women health and survival: women have a longer life expectancy, but they have more difficulties performing activities of daily living than men in all age groups [16].

Our study does not allow generalization of the results as the sample is small, the disparity between patients living in PH compared to NH was sizable. More, the study was limited to the Marseille area which may introduce a bias as habits and way of life differs between areas. We were not allowed to meet the patients because of the frailty of the population and sanitary restrictions during the COVID-19 pandemic.

Conclusion

 All centenarians studied had at least one geriatric syndrome, and almost all of them needed a walking aid. Centenarians with cognitive disorders, multiple comorbidities and polypharmacy were more likely to live in NH. The desire of some centenarians and their families to avoid institutionalization represents a real challenge for health professionals. The GP consultation has to be held at home, in coordination with several paramedical professionals. Keeping centenarians at home also requires the support of family careers.

Declarations

Conflict of interest None of the authors have relevant conflict of interests to declare.

Ethical approval This study was declared to the National Committee for Informatics and Liberties under the reference 20-277 and to Aix-Marseille University ethical committee under the reference 2022-02-24-010.

Statement of human and animal rights Human rigths are respected and this study was declared to Aix Marseille University ethical committee under the reference 2022-02-24-010.

Informed consent Eligible patients were agreeing to the use of their health data in the study.

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