Full Length Research Paper

Dementia Prevalence in Senegalese Elderly: Impact of Age, Education, and Social Network

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With the ageing of the population, dementia is increasing. In Africa, studies on dementia of the elderly are seldom. However, dementia exists and is not well documented in Senegal especially among the elderly population. We conducted a study to estimate the prevalence of this disease among Senegalese elderly population utilizing the Medico Social and University Center of IPRES, Dakar-Senegal. The study was cross-sectional and intended, through a two-wave process of data collection, to collect data from March 2004 to December 2005 among Senegalese elderly population (aged 65 years) over utilizing the MedicoSocial and University Center of IPRES, Dakar-Senegal for health care. Sociodemographic, medical history, lifestyles and social network data were collected with a structured questionnaire completed with a clinical examination and neuropsychological testing. Diagnosis of dementia was based on DSM IV criteria. The population composed of 507 patients with a mean age of 72.4 years (±5.25), mostly male, married, and non-educated. Hypertension, arthritis, gastro-intestinal, respiratory and urinary diseases were the main health conditions reported. The elderly population had a high social network. 45 patients (8.87; 95% IC: 7.61 to 10.13) had dementia in which prevalence varied significantly with age, education and social network. The results confirm the variability of dementia with age, education and social network at the Medico Social and University Center of IPRES, Dakar-Senegal.

Keywords: Dementia, prevalence, education, elderly person, Senegal.

INTRODUCTION

With the ageing of the population worldwide, dementia is a real public health priority (Qui et al., 2007). In 2010, the estimated number of dementia cases was 35.5 millions people representing 0.4% of the worldwide population. This number will be 65.7 millions in 2030 and 115.4 millions in 2050. More or less, 2/3 of the cases lived in developing countries (Wimo and Prince, 2010). Dementia constitutes a real social, economic and medical burden. Its prevalence increases with age (Lobo et al., 2000). Dementia has been associated with institutionalization (Aguero-Torres et al., 2001), functional dependency (Aguero-Torres et al.,1998) and higher mortality (Aguero-Torres et al.,1999) among elderly. Anxiety and depression are of real concern within caregivers (Mahoney et al., 2005). Costs of care are too important

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Phase I : Screening of suspected cases of dementia

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┌─────────────────────────────────┐
│ Clinical and neuropsychological │
│ evaluation of 507 patients with │
│      the Test of Hodkinson_7    │
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┌──────────────────────────┐   ┌──────────────────────────┐
│ 72 patients with score ≤ 5 │   │ 435 patients with score ≥ 6 │
└──────────────────────────┘   └──────────────────────────┘

Phase II: clinical examination and confirmation

of dementia cases

┌──────────────────────┐   ┌──────────┐   ┌──────────────┐
│ 45 cases with dementia │   │ 27 cases │   │ 435 cases without │
│   │   │ without │   │ dementia   │
│   │   │ dementia │   │   │
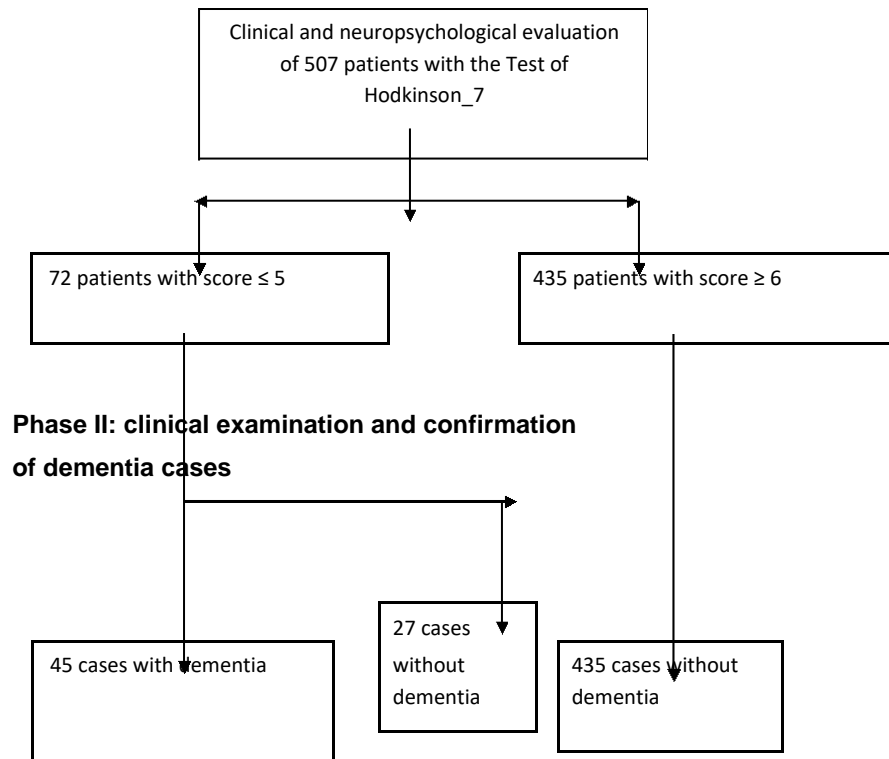└──────────────────────┘   └──────────┘   └──────────────┘

Figure 1. Description of the research process.

(Zhao et al., 2010). Several studies were conducted in developed countries to better understand the epidemiology of this new epidemic, few ones have been done in Africa (Toure et al., 2010). In Senegal, the estimated number of elderly 65 years and above was 421,305 in 2008 and 420,795 in 2009. It will be 426,443 in 2012 (ANSD, 2008). With the development of morbid conditions such as hypertension, diabetes and depression, dementia will become a real public health priority in the future (Toure et al., 2007). This means that the number of demented elderly will increase also. Considering the economic cost of dementia care, Senegal is not able to afford such cost. To plan for more accurate provision of social and medical services for the elderly population, it is important to have reliable information on the prevalence of dementia. Thus, a study was conducted to estimate the prevalence of dementia in an elderly population of dementia utilizing a primary health care service for retirees in Dakar, Senegal.

METHODS

The study population was composed of Senegalese elderly patients aged 65 years and over who came to the Medico Social and University Center of IPRES for health problems. This population is affiliated to IPRES. Those patients who were either less than 65 year old or were not able to fulfill interview are excluded (aphasia, delirium, coma, extreme visual and auditory impairment, cancer at terminal phase). The study was cross-sectional. From March 2004 to December 2005, 507 elderly patients aged 65 years and over or the relative who consulted a doctor for medical problem at the Medico Social and University Center of IPRES were first assessed with a screening interview questionnaire. Those who were considered as cognitively impaired underwent a clinical exam with neuropsychological testing. This study was the first step of a research on the validation of a screening tool to screen for dementia in a Senegalese elderly population called "The Test of Senegal" (Toure et al., 2008) (Figure 1). The screening interview questionnaire "Aging in Senegal" contained the following: socio-demographic variables (age, sex, marital status, education), medical history (vascular diseases [hypertension, heart diseases, vascular peripheral disease, stroke, diabetes], respiratory diseases, arthritis, cancer/benign tumour, Parkinson disease, epilepsy, genitor-urinary disease, cataract, glaucoma, hearing impairment, digestive disease (gastritis, constipation), anaemia, thyroid disease, head trauma, bone fracture), familial history of memory impairment, lifestyles (smoking, alcohol consumption, walking), social network (social ties with spouse, children, brothers/sisters, friends; frequency of weekly contacts with children, brothers/sisters, friends; members of community association, member of religious association), the patient's functional autonomy (Fillenbaum et al., 1985) and the neuropsychological tests with the Abbreviated Mental Test (Jitapunkul et al., 1991) and the Test of Senegal (Toure et al., 2008). The Clinical assessment instrument had four components: 1) a historical review of the patient's cognitive function, that is, the

onset and progression of any reported symptoms of cognitive impairment; 2) a review of the patient's medical, surgical and familial history, exposure to toxic products and medications; 3) a review of the patient's functional autonomy (Fillenbaum et al., 1985) 4) a review of the patient's clinical exam. Each patient underwent a screening interview with the questionnaire "Aging in Senegal" by four medical students at the MSUC who were trained for this issue. After the interview, each patient who had a score of 5 or less on the Abbreviated Mental Test (Jitapunkul et al., 1991) was referred for clinical assessment to the principal investigator. The clinical assessment consisted on a complete physical exam followed by a neuropsychological testing with the Mini Mental State Examination (Baiyewu et al., 1993). If a patient was suspected to have depression, the CES-D scale was administered to him/her to confirm the diagnosis (Radloff et al., 1997). All clinical assessments were made without knowledge of the screening status of the patient. At the end of the consultation, the team members met in a room to confirm the diagnosis of the patient. On the basis of the examination, patients with dementia were followed by the principal investigator. Appropriate laboratory exams and computerized tomography of the head were ordered and treatment of associated medical conditions proposed.

This study was approved by the ethical committee of the Senegalese Ministry of Health and university of Montreal, Quebec-Canada. Before the start of the study, informed consent was obtained from the patient and/or his/her relative.

Socio-demographic variables (age in 4 categories [65 to 69 years, 70 to 74 years, 75 to 79 years, 80 years and plus], sex, marital status, education were collected with the medical history and familial history of cognitive impairment. Lifestyles were divided into smoking habit (yes, no), alcohol consumption (yes, no) and walking (yes, no).

For the social network, we computed two indexes: diversities of social ties (score 0-4) and frequency of weekly contacts with relatives (score 0 to 6). Diversity of social ties were computed by summing "Having a spouse or husband, children, brothers/sisters and friends" and categorized into 3 levels: 0 to 2 ties, 3 ties and 4 ties. Frequency of weekly contacts with relatives were obtained by summing the frequency of weekly contacts with children, brothers/sisters and friends and categorized into 4 levels: 0 to 3 weekly contacts, 4 weekly contacts, 5 weekly contacts, 6 weekly contacts. The medical conditions related to medical variables were dichotomized into "yes or no". Dementia was defined according to the DSM-IV-R criteria (APA, 1994). All the data collected were analysed using the SPSS-13.0 version package for Windows. Univariate and bivariate analysis were performed and results expressed with a 95% confidence interval (CI).

RESULTS

The whole population (507 patients) with a mean age of 72.4 years (±5.2) were mostly male, married, and illiterates. Smoking was important (27.0%); alcohol consumption was rare (9.1%). But walking was the main physical activity (95.0%). The elderly population had a high diversity of ties and frequency of contacts with the relatives and friends (Table 1). Hypertension (58.6%), arthritis (49.5%), gastro-intestinal diseases (24.1%), respiratory diseases (14.7%) and cataract (14.4%) were the main health conditions reported in the past medical history (Table 2). 45 patients (8.87%; 95% CI: 7.61 to 10.13) had dementia. In the bi-variate analysis, age (p<0.045), education (p<0.02), diversity of ties with relatives (p<0.001), frequency of contact with relatives

(p<0.000), stroke (p<0.002), epilepsy (p<0.002) and family history of dementia (p<0.000) were associated with dementia.

DISCUSSION

In our study, the prevalence of dementia was 8.87%. This prevalence is higher than expected in our population however the study was conducted in a geriatric service. But, frequency of dementia can be high especially in medical ward and institution. In Belgium, Kurz et al. (2001) found a prevalence of 11.3% in a population of 2234 elderly patients aged 65 years and over consulting in general practice. In Mexico, a prevalence of 16.1% was observed in a population of patients in a nursing home (Alvarado-Esquivel et al., 2004). In Denmark, it was 17.4% in a population of 793 patients followed by general practitioners (Waldorff et al., 2005). In USA, the prevalence was 48.2% in Maryland in a population of 2285 nursing home patient (Magaziner et al., 2000) and 7.3% among veterans followed through the Veterans Affairs Medical care System of Texas (Krishnan et al., 2005). However, the occurrence of dementia is considered rare in African population studies related to many factors (Toure et al., 2010). Lower prevalence was observed during populational studies conducted in Benin (2.6%) (Guerchet et al., 2009), Central Nigeria (6.4%) (Ochayi and Thacher, 2006) and Ibadan-Nigeria (2.2%) (Hendrie, 1995).

In our study, prevalence of dementia increases with age, literacy and social network. The role of age as a risk factor for dementia has been highlighted in several studies. In fact, the prevalence of dementia is increasing importantly with age as observed in clinical setting and during populational studies. So, the result we observed confirms the role of ageing (specially advanced age) in the occurrence of dementia as described worldwide and especially in Europe (Kokmen et al., 1998; Erkinjuntti et al., 1986), America (Breteler et al., 1998; Beard et al., 1995; Evans et al., 1989) and also Africa (Hendrie et al., 1995; Toure et al., 2008; Guerchet et al., 2010). Life expectancy is increasing in Africa and better ageing is possible through healthy lifestyle. Unfortunately, ageing is sometimes associated with the occurrence of cumulative risk factors for dementia as chronic diseases (hypertension, diabetes, hypercholesterolemia, and cancer), loneliness, isolation and poverty. Illiteracy which was frequent in our study population (57%) was associated with dementia. This result confirmed the role of illiteracy as a risk factor for dementia in elderly population as already seen in studies realized worldwide (Ravaglia et al., 2002; Katzman, 1993). So, it is important to set up and sustain an educational program dedicated to educate the youth at a higher level (till secondary school level at least) to prevent dementia in the ageing population.

African elderly occupied a central place in the society

Table 1. Sociodemographic characteristics, lifestyles and social network of the population of patients (N=507).

Variables	N	Percentage
Age : Mean (72,4 years ± 5,25: 65-90 years)		
65-69 years	160	31.6
70-74 years	178	35.1
75-79 years	118	23.3
80 years +	51	10.1
Sex		69.6
Male	353	
Marital Status		76.9
Married	390	
Education		47
Yes	240	
Alcohol		9.1
Yes	47	
Smoking		27
Yes	137	
Working		95.5
Yes	484	
Other activities		85
Absence	431	8.5
1 activity	43	6.5
2 activities +	33	
Diversity of social ties with relatives		6.1
0-2 liens	31	27.8
3 liens	141	66.1
4 liens	335	
Weekly contacts with relatives		11.8
0-3 contacts	60	17.4
4 contacts	88	14.2
5 contacts	72	56.6
6 contacts +	287	

where ageing was associated with respectfulness and dignity. He or she was living in a place where you could find 3 generations in the same place especially in the village where this family structure was the rule. His or her involvement in the societal development was well known and also securing the traditional values. But, with the modernization of the society and the economic crisis, the elderly seems to be alone and isolated. This situation could lead to depression and also dementing illness. In our study population, 6.1 and 11.8% of the elderly had respectively 0 to 2 ties and few weekly contacts with the relatives (at least 3 contacts). The prevalence of dementia varied significantly with the importance of social network. This result confirms what was described and observed in studies conducted worldwide showing that low social network is a great risk factor for dementia in elderly population (Fratiglioni et al., 2004; Bennett et al., 2006). In fact, low social network and its corollary loneliness is frequently associated with depression, cardiovascular diseases and vascular risk factors, which

Table 2. Prevalence of dementia and sociodemographic characteristics, lifestyles and social network of the population of patients (N=507).

Variables	Number of cases of dementia	Prevalence (%)	P-value
Age			0.045*
65-69	8	5.0	
70-74	16	9.0	
75-79	12	10.2	
80 et +	9	17.6	
Sex			
Male	31	8.7	0.515
Female	14	9.0	
Marital Status			
Married	31	7.9	0.125
No-married	14	12	
Education			0.02*
Yes	31	12.8	
No	14	53	
Smoking			0.732
Yes	12	8.8	
No	33	8.9	
Alcohol			0.556
Yes	3	6.5	
No	42	9.1	
Other Activities			0.398
Absence	31	8.8	
1 activity	3	6.7	
2 activities +	4	8.9	
Diversity of social ties			0.001*
0-2 liens	8	25.8	
3 liens	15	10.6	
4 liens	22	6.5	
Weekly Contacts with relatives			0.0001*
0-3 contacts	12	20	
4 contacts	14	16.9	
5 contacts	8	11.1	
6 contacts +	11	3.8	

are main risk factors for dementia (Stewart et al., 2003; Green et al., 2003).

Limits of the study

As a non-randomized cross-sectional study, under-estimation of dementia could be a limit because all the patients were not screened. First of all, the tool we used to screen for dementia was not fully sensitive, as such, demented patients could be missing thereby leading to an under-estimation of this disease among the sample. Secondly, some demented patients had been missing as they were not present during the consultation because of their disease. Thirdly, the study had a problem of external validity because the patients who were unrolled neither represent all the patients of the Medico-social and University Center of IPRES, nor the whole Senegalese

elderly population.

Conclusion

This study has shown a higher prevalence of dementia in this Senegalese elderly population of patients admitted at the Medico Social and University Center of IPRES, Dakar-Senegal. It confirmed the variability of the prevalence with age, education and social network. It is important to take into consideration these results for planning dementia prevention program in Senegal.

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