Original Research Article

Risk Factors for Dementia in a Senegalese Elderly Population Aged 65 Years and Over

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Key Words

Abstract

Background: With the aging of the population, dementia is increasing worldwide. The objective of this study was to identify risk factors for dementia in an elderly population utilizing a primary health care service in Dakar, Senegal. **Methods:** Through a cross-sectional study conducted from March 2004 to December 31, 2005, 507 elderly patients aged ≥65 years who came to the Social and Medical Center of IPRES, Dakar, Senegal, were first screened with the screening interview questionnaire 'Aging in Senegal'. Those who were cognitively impaired underwent a clinical examination to detect dementia. Univariate, bivariate, and multivariate logistic regression analyses were done. **Results:** The whole population had a mean age of 72.4 years (±5.2) and was mostly male, married, and non-educated. Hypertension, arthritis, and gastrointestinal diseases were the main health conditions reported in the past medical history. Smoking was important while alcohol consumption was rare. Social network was high. Forty-five patients (8.87%) had dementia. In the multivariate model, only advanced age, education, epilepsy, and family history of dementia were independently associated with dementia. **Conclusion:** The risk factors identified are also found in developed countries confirming their role in dementia. It is important to take dementia into consideration in Senegal and to sensitize the community for prevention.

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Introduction

With the aging of the population worldwide, dementia is a real public health priority [1]. In 2000, the estimated number of dementia cases was 25.5 million people, representing 0.4% of the worldwide population. Moreover, 52% of the cases lived in developing countries. This number will be 65.7 million in 2030 and 115.4 million in 2050. Nearly two thirds of all people with dementia lived in low- and middle-income countries [2]. Dementia constitutes a real social, economic, and medical burden. Its prevalence increases with age [3]. The other most important risk factors are low level of education [4], heredity [5], low early-life economic conditions [6], smoking [7], alcohol [8], weak social network [9], hypertension [10], cardiovascular diseases [11], stroke [12], epilepsy [13], diabetes [14], anemia [15], Parkinson's disease [16], and head trauma [17].

Although several population-based studies were conducted in developed countries to better understand the epidemiology of this new epidemic, only a few studies have been done in Africa [18]. In Senegal, the estimated number of elderly aged ≥65 years was 421,305 in 2008 and 420,795 in 2009. It will be 426,443 in 2012 [19]. 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. It is important to have reliable information on the prevalence of dementia to plan for more accurate provision of social and medical services for the elderly population. Identifying risk factors helps to plan for prevention programs. Studies on dementia in the Senegalese elderly population are rare [20, 21]. Thus, a study was conducted in Senegal to determine the epidemiology of dementia in an elderly population utilizing a primary health care service for retirees in Dakar, Senegal. The aim of the present study was to identify risk factors associated with dementia in this population of retirees utilizing the Social and Medical Center (SMC) of IPRES (Institution de Prevoyance Retraite du Senegal), Dakar, Senegal.

Methods

Study Design

The site of the study was the SMC of IPRES. This is a health center for the retired Senegalese elderly population affiliated to IPRES ensuring medical and social services. As a primary care center with diverse health personnel, it ensures full and free medical coverage to the elderly population and their families. A pharmacist offered free medication.

The study population was composed of Senegalese elderly patients aged ≥65 years who came to the SMC of IPRES for health problems. This population is affiliated to IPRES. Those patients who were either <65 years old or were not able to fulfill the interview (due to aphasia, delirium, coma, extreme visual and auditory impairment, or cancer at terminal phase) were excluded.

The study was cross-sectional. From March 2004 to December 2005, 507 elderly patients aged ≥65 years – or their relatives – who consulted a doctor for a medical problem at the SMC of IPRES were first assessed with a screening interview questionnaire. Those who were cognitively impaired, with a sex-matched sample, 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' [22].

The Screening Instruments

Two screening instruments were used: the interview questionnaire called 'Aging in Senegal' and the clinical assessment instrument.

The screening interview questionnaire 'Aging in Senegal' contained the following: sociodemographic variables (age, sex, marital status, education), medical history [vascular diseases (hypertension, heart diseases, vascular peripheral disease, stroke, diabetes), respiratory diseases, arthritis, cancer/benign tumor, Parkinson's disease, epilepsy, genitourinary disease, cataract, glaucoma, hearing impairment, digestive disease (gastritis, constipation), anemia, thyroid disease, head trauma, bone fracture], familial history of memory impairment, lifestyle (smoking, alcohol consumption, walking), social network (social ties with spouse, children, brothers/sisters, friends; frequency of weekly contact with children, brothers/sisters, friends; members of community association, member of religious association), the patient's functional autonomy [23], and the neuropsychological tests with the Abbreviated Mental Test [24] and the Test of Senegal [25]. This tool was used by the medical students.

The clinical assessment instrument had four components: (1) a historical review of the patient's cognitive function, i.e., 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 [23], and (4) a review of the patient's clinical exam and neuropsychological testing with the Mini-Mental State Examination (MMSE) [26]. This tool was used by the principal investigator (K.T.).

Interview

Each patient underwent a screening interview with the questionnaire 'Aging in Senegal' by four medical students at the SMC who were trained for this issue. This interview was conducted concomitantly with the informant and the patient. It aimed to collect data related to sociodemographics, lifestyle, past medical history, and social network and to screen for neuropsychological performance with the Abbreviated Mental Test.

Clinical Assessment

After the interview, each patient who had a score of ≤5 on the Abbreviated Mental Test [24] was referred for clinical assessment to the principal investigator (K.T.). At the same time, a sex-matched normal subject was also referred for clinical assessment. The clinical assessment consisted of a complete physical exam followed by a neuropsychological testing with the MMSE [26]. If a patient was suspected to have depression, the CES-D scale was administered to him/her to confirm the diagnosis [27]. 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 (K.T.). Appropriate laboratory exams and computerized tomography of the head were ordered and treatment of associated medical conditions proposed.

Variables of Studies

Sociodemographic variables [age in 4 categories (65–69, 70–74, 75–79, and ≥80 years), sex, marital status, education] were collected with the medical history and familial history of cognitive impairment. Lifestyle was 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 contact with relatives (score 0–6). Diversity of social ties was computed by summing 'Having a spouse or husband, children, brothers/sisters, and friends' and

Table 1. Characteristics of the population (n = 507)

Variables	n	%
Mean age ± SD, years	72.4 ± 5.25	
Education	240	47.3
Married	390	76.9
Alcohol consumption	47	9.1
Smoking	137	27
Contact with relatives		
0–3 contacts	60	11.8
Weekly contact with relatives		
0–2 contacts	31	6.1

categorized into 3 levels: 0–2 ties, 3 ties, and 4 ties. Frequency of weekly contact with relatives was obtained by summing the frequency of weekly contact with children, brothers/sisters, and friends and categorized into 4 levels: 0–3 weekly contacts, 4 weekly contacts, 5 weekly contacts, and 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 [27, 28].

Ethical Consideration

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

Statistical Analysis

All the data collected were analyzed using the SPSS-13.0 version package for Windows. Univariate, bivariate, and multivariate stepwise logistic regression analyses were computed. The odd ratios of the different risk factors were computed with a 95% CI.

Results

Forty-five patients (8.87%; 95% CI 7.61–10.13) had dementia. The whole population with a mean age of 72.4 years (±5.2) was mostly male, married, and illiterate. Smoking was important (27.0%) while alcohol consumption was rare (9.1%). Walking was the main physical activity (95.0%). The elderly population had a high diversity of ties and frequency of contact with relatives and friends (table 1). Hypertension (58.6%), arthritis (49.5%), gastrointestinal diseases (24.1%), respiratory diseases (14.7%), and cataract (14.4%) were the main health conditions reported in the past medical history (table 2).

In the bivariate analysis, age (p < 0.045), education (p < 0.02), diversity of ties with relatives (p < 0.001), frequency of contact with relatives (p < 0.0001), stroke (p < 0.002), epilepsy (p < 0.002), and family history of dementia (p < 0.0001) were associated with dementia.

In the multivariate model, advanced age (≥80 years; OR 4.26; 95% CI 1.36–13.3), illiteracy (OR 2.76; 95% CI 1.23–6.20), epilepsy (OR 11.72; 95% CI 2.10–65.23), and family history of dementia (OR 7.56; 95% CI 3.42–16.76) were independently associated with dementia (table 3).

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Table 2. Medical, surgical, and familial past history (n = 507)

Variables	n	%
Hypertension	297	58.6
Arthritis	251	49.5
Gastrointestinal disease	122	24.1
Genitourinary disease	82	16.2
Cataract	73	14.4
Respiratory diseases	72	14.2
Anemia	54	10.7
Head trauma	50	9.9
Fracture of the bone	37	7.3
Diabetes	36	7.1
Heart disease	34	6.7
Stroke	23	4.5
Parkinson's disease	7	1.4
Epilepsy	7	1.4
Glaucoma	7	1.4
Thyroid disease	2	0.4
Familial history of dementia	46	9.1

Table 3. Results of the multivariate analysis

Variables	OR	95% CI
Age		
65–69 years	–	–
70–74 years	1.92	0.7–5.1
75–79 years	1.96	0.68–5.7
≥80 years	4.26	1.36–13.3
Illiteracy	2.76	1.23–6.20
Epilepsy	11.72	2.10–65.23
Family history of dementia	7.56	3.42–16.75

Discussion

In our study, prevalence of dementia was 8.87% with advanced age, illiteracy, epilepsy, and family history of dementia as independent risk factors. These risk factors were either self-reported by the patient or informant-reported.

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 a clinical setting and during population studies. Thus, the result we observed confirms the role of ageing (especially advanced age) in the occurrence of dementia as described elsewhere in Europe [3, 29–31], America [32–34], Asia [35–37], and Africa [21, 38–41].

Illiteracy was frequent (57%) and was associated with dementia in our elderly population. This result confirms the role of illiteracy as a risk factor for dementia in an elderly population as already seen in studies realized worldwide [42–46].

Epilepsy in the elderly is frequent, with an estimated prevalence of 1% after 60 years of age [47] and an incidence increasing with age [48]. In our study population, history of epilepsy was present in 1.4% of the elderly and associated with dementia. This finding has been observed in several studies conducted worldwide, enhancing the association between a history of epilepsy and dementia in an elderly population [13, 49–52]. This association could be

related to the disease itself, its cause or risk factor, but also to the treatment prescribed, especially in our country, where most of the epileptic patients are on a first-generation anti-epileptic regimen, which is harmful for cognition. Whatever the mechanism, epilepsy is associated with the occurrence of dementia.

Familial history of dementia, which was observed in 9.1% of our study population, has been associated with the occurrence of dementia. The role of heredity in dementia is known specially for Alzheimer's disease [53]. In fact, studies in Australia [54], Africa [55, 56], Europe [57, 58], and the USA [5] have demonstrated that familial history of dementia is a main risk factor for dementia in an elderly population. Also, ApoE ε4 has been associated with Alzheimer's disease in the developed world [59, 60]. However, this association is absent in an African study [61]. Genetic mutations are also observed in demented persons at chromosome 12 [62] and chromosomes 6, 9, 10, 12, 19, and 21 [63, 64].

Limitations of the study include the underestimation of the prevalence because all the demented patients were not recruited during the study period. Medical illnesses were based upon self-report or informant report rather than on direct examination. Moreover, memory bias could underestimate risk factors and, thus, their role in the occurrence of dementia. Also, this study is a prevalence study, not an incidence study, characterized by temporality of the association between risk factors and dementia. However, it highlights and confirms the role of these risk factors on dementia occurrence in an elderly population.

Conclusion

This study has shown that illiteracy, epilepsy, and familial history of dementia were associated with dementia in this study population. Additionally, it confirms the role of these risk factors in the occurrence of dementia in an elderly population as described elsewhere. As the Senegalese population is aging, it is necessary to take dementia into consideration in the social, political, and medical practice and to sensitize political leaders, the health personnel, and the population for the prevention of this disease.

Disclosure Statement

The authors declare that they have no conflicts of interest.

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