Dementia in a Senegalese Elderly Population of Patients 65 Years and Over: Prevalence and Risk Factors

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**Abstract**

**Background:** With the aging of the population, dementia is increasing worldwide. The objective of this study was to estimate the prevalence of dementia in an elderly population utilizing a primary health care service in Dakar, Senegal and to identify the risk factors.

**Methods:** Through a cross-sectional conducted from March 2004 to 31 December 2005, 507 elderly patients aged 65 years and over received at the Social and Medical Center of IPRES, Dakar-Senegal were first screened with a screening interview questionnaire ‘Aging in Senegal’. Those who were cognitively impaired underwent a clinical exam to detect dementia. Uni, bi and multivariate logistic regression analysis were done.

**Results:** The population of study has a mean age of 72.4 years (±5.2), mostly male, married, and non-educated. Hypertension, arthritis, gastro-intestinal diseases and 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:** Prevalence of dementia is high in the elderly primary care patients with risk factors identical to the ones found in developed countries. It is important to take into consideration dementia in Senegal and to sensitise the community for primary prevention.

**Keywords:** Dementia; Prevalence; Risk factors; Elderly population; Senegal

**Introduction**

With the ageing of the population worldwide, dementia is a real public health priority [1]. 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. Moreless 2/3 of the cases lived in developing countries [2]. Dementia constitutes a real social, economic and medical burden. However several studies were conducted in developed countries to better understand the epidemiology of this new epidemic, few ones have been done in Africa [3]. Considering the economic cost of dementia care, Senegal is not able to afford such cost. However, 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 program. Thus, a study was conducted in an elderly population of patients utilizing a primary health care service for retirees in Dakar-Senegal to estimate the prevalence of dementia and to identify its risk factors.

**Methods**

**The site of the study**

The Social and Medical Center of IPRES (SMC), Dakar-Senegal.

It is a health center for the retired Senegalese elderly populations affiliated to IPRES (Institution de Prevoyance Retraite du Senegal) 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 medications.

**The study population**

The study population was composed of Senegalese elderly patients aged 65 years and over who came to the Social and Medical Center of IPRES for health problems. This population is affiliated to IPRES. Were excluded those patients who were either less than 65 year old or not able to fulfill interview (aphasia, delirium, coma, extreme visual and auditory impairment, cancer at terminal phase).

**Data collection**

The study was cross-sectional. From March 2004 to December 2005, 507 elderly patients aged 65 years and over who consulted a doctor for medical problem at the Social and Medical Center of IPRES for health problems. This population is affiliated to IPRES. Were excluded those patients who were either less than 65 year old or not able to fulfill interview (aphasia, delirium, coma, extreme visual and auditory impairment, cancer at terminal phase).

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the validation of a screening tool to screen for dementia in a Senegalese elderly population called "The Test of Senegal" [4].

The screening tools:

The screening interview questionnaire “Aging in Senegal”: It 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 tumour, Parkinson disease, epilepsy, genitor-urinary disease, cataract, glaucoma, hearing impairment, digestive disease (gastroitis, 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 [5] and the neuropsychological tests with the Abbreviated Mental Test [6] and the Test of Senegal [7].

Clinical assessment instrument: The 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 [5]; 4) a review of the patient’s clinical exam.

Research design: 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. After the interview, each patient who had a score of 5 or less on the Abbreviated Mental Test [7] was referred for clinical assessment to the principal investigator (KT). The clinical assessment consisted on a complete physical exam followed by a neuropsychological testing with the Mini Mental State Examination [8]. If a patient was suspected to have depression, the CES-D scale was administered to him/her to confirm or not the diagnosis [9]. On the basis of the examination, patients with dementia were followed by the principal investigator (KT). Appropriate laboratory exams and computerized tomography of the head were ordered when needed and treatment of associated medical conditions proposed.

Ethical consideration

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.

Variables of the study

Sociodemographic variables (age in 4 categories [65-69 years, 70-74 years, 75-79 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 0-6). Diversity of social ties were computed by summing “Having a spouse or husband, children, brothers/sisters and friends” and categorized into 3 levels: 0-2 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: 0-3 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 [10].

Data analysis

All the data collected were analysed using the SPSS-13.0 version package for Windows. Univariate, bivariate and multivariate stepwise logistic regression analysis were computed. Frequency means and standard deviations were calculated and frequencies compared using Chi square. Odds ratios of the different risk factors were computed with a 95% confidence interval (CI).

Results

The whole population (507 patients) with a mean age of 72.4 years (±5.2) was mostly male, married, and illiterated. 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%), 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). The mean scores with standard deviation and extremes values obtained with the population were as below: ADL: 4.68 (±1.02; 1-5 points), MMSE: 17.1 (±5.0; 3-22 points), AMT_7: 6.24 (±1.3; 0-7 points), Test of Senegal: 34.7 (±6.3; 6-39 points).

Forty five patients (8.87%; 95% CI: 7.61-10.13) had dementia. In the bivariate analysis, prevalence of dementia varied with age, education, diversity of ties with relatives, frequency of contact with relatives, past medical history of stroke, epilepsy and family history of dementia.

In the multivariate analysis, advanced age (80 years and over) [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).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>353</td>
<td>69.6</td>
</tr>
<tr>
<td>Education (yes)</td>
<td>240</td>
<td>47.3</td>
</tr>
<tr>
<td>Marital status (yes)</td>
<td>390</td>
<td>78.9</td>
</tr>
<tr>
<td>Smoking (yes)</td>
<td>137</td>
<td>27.0</td>
</tr>
<tr>
<td>Contact with relatives (0-3 contacts)</td>
<td>60</td>
<td>11.8</td>
</tr>
<tr>
<td>Alcohol (yes)</td>
<td>46</td>
<td>9.1</td>
</tr>
<tr>
<td>Diversity of social ties (0-2 ties)</td>
<td>31</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Table 1: Characteristics of the study population (N = 507).

<table>
<thead>
<tr>
<th>Variables (yes)</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>297</td>
<td>58.6</td>
</tr>
<tr>
<td>Arthritis</td>
<td>251</td>
<td>49.5</td>
</tr>
<tr>
<td>Gastro-intestinal disease</td>
<td>122</td>
<td>24.1</td>
</tr>
<tr>
<td>Genito-urinary disease</td>
<td>82</td>
<td>16.2</td>
</tr>
<tr>
<td>Cataract</td>
<td>73</td>
<td>14.4</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>72</td>
<td>14.2</td>
</tr>
<tr>
<td>Anemia</td>
<td>54</td>
<td>10.7</td>
</tr>
<tr>
<td>Head trauma</td>
<td>50</td>
<td>9.9</td>
</tr>
<tr>
<td>Familial history of dementia</td>
<td>46</td>
<td>9.1</td>
</tr>
<tr>
<td>Fracture of the bone</td>
<td>37</td>
<td>7.3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>36</td>
<td>7.1</td>
</tr>
<tr>
<td>Heart disease</td>
<td>34</td>
<td>6.7</td>
</tr>
<tr>
<td>Stroke</td>
<td>23</td>
<td>4.5</td>
</tr>
<tr>
<td>Parkinson disease</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>Thyroid disease</td>
<td>2</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Table 2: Medical, surgical and familial past history of the study population (N=507).
The prevalence of dementia is higher than expected with age, illiteracy, and familial history of dementia as risk factors. It confirms the role of illiteracy as a risk factor for dementia in elderly population. Also, ApoE ε4 has been associated with familial history of dementia is a main risk factor for dementia in the elderly population. This result confirmed the role of illiteracy as a risk factor for dementia in elderly population as already seen in studies realized worldwide [22-25].

Epilepsy in the elderly is frequent with an estimated prevalence of 1% after 60 years [26] and an incidence increasing with age [27]. 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 history of epilepsy and dementia in elderly population [28,29]. This association could be related to the disease itself, its cause or risk factor but also the treatment prescribed specially in our country where most of the epileptic patients are on 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 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 Alzheimer disease. In fact, studies in Africa [30,31], Europe [32,33] and USA [34] have demonstrated that familial history of dementia is a main risk factor for dementia in elderly population. Also, ApoE ε4 has been associated with Alzheimer disease in developed world [35,36] however this association was absent in African study [37]. Genetic mutations are also observed in demented persons at chromosome 12 [38] and chromosomes 6, 9, 10, 12, 19 and 21 [39,40].

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. In facts, the occurrence of dementia is considered rare in African population studies related to many factors [3]. However, the prevalence of dementia in elderly population admitted in clinical settings is high: 11.3% in Belgium [11], 16.1% in Mexico [12], 17.4% in Dutch Republic [13], 48.2% in Maryland, USA [14] and 7.3% in Texas, USA [15].

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 elsewhere in Europe [16], America [17], Asia [18,19] and Africa [20,21].

Illiteracy, frequent (57%), was associated with dementia in our elderly population. This result confirmed the role of illiteracy as a risk factor for dementia in elderly population as already seen in studies worldwide [22-25].

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Conclusion

This study is the first conducted on dementia in a population of elderly aged 65 years and over in Senegal. It has shown that the prevalence of dementia was higher than expected with age, illiteracy, epilepsy and familial history of dementia as risk factors. It confirms too the role of these risk factors in the occurrence of dementia. As the Senegalese population is aging, it is necessary to take into consideration dementia in the social, political and medical practice and to sensitize political leaders, the health personnel and the population for the prevention of this disease.

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