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Epidemiological, clinical and paraclinical aspects of vascular dementia in the Neurology Department of the CHU Ignace DEEN.

By

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Abstract

Introduction: *Vascular dementias (VD) are dementias caused by cerebrovascular lesions. Few data exist on this subject in tropical environments.*

The aim of this study was to determine the frequency and the clinical and paraclinical aspects of vascular dementia at the Ignace DEEN University Hospital.

Material and methods:*This was a cross-sectional descriptive study lasting two (2) years, from 01 March 2021 to 28 February 2023 in the neurology department of CHU Ignace DEEN (Guinea-Conakry). All patients meeting the criteria for probable vascular dementia according to the NINDS-AIREN (appendix) and for whom informed consent had been obtained from the responsible persons were included in our study. Patients with a history of Parkinson's disease, Alzheimer's disease, chronic adult hydrocephalus or encephalitis were excluded.*

Results: *We observed a hospital frequency of 38.46%. The mean age of our patients was 72.52 +/- 10.61 years. Males accounted for the majority, 76.66% (sex ratio 3.28). The educational level was pre-university in 32.5% of cases and 24.16% of patients had no schooling. Arterial hypertension was the most common cardiovascular risk factor, accounting for 64.17% (77 cases), followed by dyslipidasemia and diabetes, which accounted for 35.83% (43 cases) and 35% (42 cases) respectively. The main reasons for consultation were memory problems (77.5%), behavioural problems (65.8%) and reasoning problems (49.2%). Assessment of the MMSE revealed severe cognitive impairment in 35.83% (43 cases), moderate cognitive impairment in 43.33% (52 cases) and mild cognitive impairment in 20.83% (25 cases).*

Conclusion: *Vascular dementia is multiple, multifactorial and predominantly affects the elderly.*

Keywords: *Dementia, vascular, Ignace DEEN*

Introduction

Vascular dementias (VD) are dementias caused by cerebrovascular lesions[1]. In Europe, VD accounts for 15-20% of dementias, making it the second leading cause of dementia in the elderly after Alzheimer's disease (AD) [2]. In Japan and China, on the other hand, vascular dementia accounts for almost 50% of all dementias [3]. In Burkina Faso, EE et al report that VaD accounts for 51.35% of dementias [4]. Prevalence and incidence increase with age [5]. In most cases of dementia of cerebrovascular origin, the intellectual impairment is frontal or subcortical, in contrast to the typical cortical presentation of Alzheimer's disease [6]. Clinical diagnostic criteria have moderate sensitivity (50-70%) and variable specificity (64-98%) [7]. Because of their high specificity, the consensus criteria developed by the National Institute for Neurological and Communicative Disorders and Stroke (NINDS)-Association Internationale pour la Recherche et l'Enseignement en Neurosciences (AIREN) have been used in controlled clinical trials to select patients with pure VaD [8].

Cerebrovascular disease is very heterogeneous and is a risk factor for cognitive impairment and dementia[9] [10]. Brain imaging shows cortical infarction, subcortical infarction and

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white matter changes, each alone or in combination [11]. The aim of this study was to determine the frequency and the clinical and paraclinical aspects of vascular dementia at CHU Ignace DEEN.

Material and methods

This was a cross-sectional descriptive study lasting two (2) years, from 01 March 2021 to 28 February 2023, in the neurology department of CHU Ignace DEEN (Guinea-Conakry).

We targeted all patients admitted with dementia to our department during the study period. The diagnosis of dementia was based on a Mini Mental State Examination (MMSE) score of less than 24.

All patients who met the NINDS-AIREN criteria for probable vascular dementia (appendix) and for whom informed consent had been obtained from the responsible persons were included in our study. We excluded patients with a history of Parkinson's disease, Alzheimer's disease, chronic adult hydrocephalus or encephalitis.

In this study we first determined the frequency of vascular dementia, then studied the socio-demographic characteristics, clinical and paraclinical data. The socio-demographic characteristics included age, sex, origin, vascular history and cardiovascular risk factors, educational level and time to onset of cognitive impairment.Clinical data includes reasons for consultation, MMSE and NINDS-AIREN. The paraclinical data are the type of stroke, the topography of the stroke, the presence of mico-bleeds, vascular leukopathy and vascular angiopathy.

We expressed the qualitative variables as a percentage, calculated the mean and standard deviation of the quantitative variables and determined the sex ratio.

Results

In the course of our study we recorded 312 cases of dementia, 132 patients met our inclusion criteria, but we excluded 13 patients and our study covered 120 patients, i.e. a hospital frequency of 38.46%. The mean age of our patients was 72.52 +/- 10.61 years, with extremes of 48 and 104 years.

Males accounted for 76.66% (92 cases) of patients, with a sex ratio of 3.28. We found that 83 patients (69.17%) came from urban areas, and 37 patients (30.83%) from rural areas. The educational level of our patients was pre-university in 32.5% (39 cases) and post-university in 43.33% (52 cases), although 24.16 (29 cases) of our patients did not attend school. Arterial hypertension (AH) was the most common cardiovascular risk factor, accounting for 64.17% (77 cases), followed by dyslipidaemia and diabetes, which accounted for 35.83% (43 cases) and 35% (42 cases) respectively (Table 1). The other cardiovascular risk factors are shown in Table 2. The main reasons for consultation were memory problems (77.5%), behavioural problems (65.8%) and reasoning problems (49.2%). Assessment of the MMSE (table 3) revealed severe cognitive impairment in 35.83% (43 cases), moderate cognitive impairment in 43.33% (52 cases) and mild cognitive impairment in 20.83% (25 cases).

Table 1: Breakdown of patients by cardiovascular risk factor (CVRF)

CVRF	Headcount	Proportions (%)
HTA	77	64,1
Diabetes	42	35,0
Tobacco	26	21,6
Dyslipidaemia	43	35,8
Alcohol	18	15,0

Table 2: Breakdown of patients by reason for consultation

Clinical signs	Headcount (N120)	Women (n1=44)	Men (n2=76)
Memory disorders	93(77,5%)	31(70,5%)	62(81,6%)
Behavioural disorders	79(65,8%)	28(63,6%)	51(67,1%)
Reasoning disorders	59(49,2%)	17(38,6%)	42(55,3%)
Déficit motor	57(47,5%)	24(43,4%)	24(54,5%)
Apraxia	52(43,3%)	18(40,9%)	34(44,7%)
Language disorders	53(44,2%)	19(43,2%)	34(44,7%)
Agnosia	40(33,3%)	11(25%)	29(38,2%)
Psychomotor agitation	27(22,5%)	14(31,8%)	13(17,1%)
Sphincter disorders	27(22,5%)	10(22,7%)	17(22,4%)
Headaches	26(21,7%)	9(20,5%)	17(22,4%)
Epileptic seizures	16(13,3%)	8(18,2%)	8(10,5%)

Table 3: Breakdown of patients by MMSE score on admission

Score MMSE	Headcount	Proportions (%)
≤ 10	43	35,83%
[11-20]	52	43,33%
[21-26]	15	12,50%
> 26	10	8,33

Discussion

Variations in the definition of DV, vascular aetiologies and cerebral changes allowed in current criteria have led to varying estimates of prevalence[12].

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The frequency of DV varies according to age group, diagnostic criteria and study duration. The frequency of DV in our study is higher than the European data (30%), but lower than those of our colleagues in Burkina Faso and Asia, who report 51.35% and 50% respectively [2-4].

In many studies, demographic variables, including education level, age and previous stroke, have been found to be important risk factors for cognitive impairment in stroke survivors[13].

The majority of our patients (43.33%) had a post-graduate level of education, which could be explained by the fact that 62% of patients came from urban areas where access to education is easier.

Cardiovascular risk factors favour the onset of cognitive impairment, particularly after a stroke [14]. High blood pressure (64.17%) was the most common CRVD in our study, followed by dyslipidaemia (35.83%) and diabetes (35%). Early identification of CRVD remains the best opportunity for treatment likely to prevent or delay the rate of DV. However, once these have set in, there is as yet no beneficial pharmacological treatment [15,16]. Treatment of hypertension can reduce the prevalence of dementia in elderly hypertensive patients by 50% [17].

Approximately 25 to 41% of stroke survivors aged 65 and over develop DV within 3 months of stroke [18]. Some studies report that the prevalence of cognitive decline after stroke increases exponentially with increasing age after 65 [19]. The mean age of our patients was 72.52 +/- 10.61 years. This result is similar to that of Erkinjuntti T et al who reported a mean age of 70.3 years [12], but higher than that of Meriem EM et al who observed a mean age of 62.20 years [20], and lower than that of Zekry D et al who observed 87±6 years [21]. As with stroke, vascular dementia may occur earlier in Africa than in Western countries, due to late detection of cardiovascular risk factors and poor management.

Vascular dementia is a group of disorders that are very heterogeneous in clinical, pathological and aetiological terms [17]. The pathogenesis of DV is multifactorial and its pathophysiology affects the neural networks involved in cognition, memory, behaviour and executive functioning [22]. The clinical and neuropsychological manifestations of DV are fronto-subcortical in nature, quite distinct from those of Alzheimer's disease [23]. Executive dysfunction is often observed, but memory disorders are mild or even non-existent [2]. Sometimes there is a combination of executive dysfunction, personality change or apathy [24]. There are several diagnostic criteria, but the NINDS-AIREN is the most specific and the most useful in research [25].

The main subtypes of vascular dementia (VaD) previously defined include cortical vascular dementia secondary to multiple infarcts, haemorrhage or hypoperfusion, subcortical ischaemic vascular dementia or small vessel dementia and dementia caused by strategic infarcts (thalamus, frontobasal and/or limbic systems) [12] [26]. In 35.8% of cases, it is a large vessel infarction. And in 60.3% of cases, small vessel disease was reported[27]. In our study, dementia according to the MMSE was very severe in 43.33%, severe in 35.83% and moderate in 12.50%.

Conclusion

Vascular dementias are becoming increasingly well known, with multiple aetiologies and a polymorphous clinical presentation. Vascular dementia predominates in the elderly but can also occur in young people. Management of cardiovascular risk factors is nowadays the only therapeutic option.

A further study will determine the risk factors for vascular dementia in our context.

Appendix

The following criteria are used to diagnose vascular dementia:
Probable:

1. Dementia: - cognitive decline from previous level - decline in memory and at least 2 other cognitive domains - interfering with activities of daily living.
2. Cerebrovascular disease: - presence of focal signs on neurological examination - CT or MRI evidence of cerebrovascular lesion
3. Relationship between the above 2 conditions, based on : - onset of dementia within 3 months of stroke - abrupt deterioration in cognitive function, or fluctuating or abrupt worsening of cognitive deficits.
4. Criteria in favour of diagnosis (optional) : - early gait disorders - history of instability, spontaneous falls - micturition control disorders - pseudo-bulbar paralysis, emotional incontinence - personality and mood changes --Possible: Same as probable, except:

1. No CT or MRI evidence of cerebrovascular lesion
2. Or absence of a clear temporal relationship between dementia and stroke
3. Or insidious onset with variable progression (plateau, improvement)

Certain: Same as probable, plus:

1. Histopathological signs of cerebrovascular disease
2. Absence of neurofibrillary degeneration and senile plaques
3. Absence of other clinical or neuropathological conditions that may cause dementia

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