Journal of
Neurology and Neuro Toxicology

RESEARCH ARTICLE

Stroke Associated to Cannabis Use, Cigarette Smoking, and Alcohol Consumption. A Hospital Based Study from Burkina Faso

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Abstract

Objective: To determine the characteristic of stroke related to Cannabis Use, Cigarette Smoking, and Alcohol Consumption in a tertiary hospital in Burkina Faso.

Methodology: This was retrospective and observational study carried on stroke patients admitted in Neurology Department of YOUTH during a period going from January 1st 2015 up to December 31th 2018. Patients consumers of alcohol, tobacco and cannabis were included. In opposition, patients with major vascular risk factors (hypertension, diabetes mellitus, past history of cardiopathy, history of dyslipidemia) were excluded from this study.

Results: We reported 32 cases of stroke related to cannabis, alcohol and tobacco use. Twenty-six cases were ischemic stroke and 6 were (18.7%) hemorrhagic. This study included 19 men and 13 women with a mean age of 41.9 years (ranges: 20- 60 years). Young patients (< 45 years) accounted for 56.2% of cases. Twenty for (75%) patients were cigarette smokers, 22 (68.8%) were alcohol drinkers and 3 (9.4%) were cannabis users. Toxicological drug screening was performed in in 6 (18.7%) cases and was positive for cannabis in 3 cases. The etiology of ischemic stroke was classified as atherosclerosis in 5 (23.1%), cardioembolism in 6 (19.2%) and unknown in 15(57.6%). Atrial fibrillation was the most cause of cardioembolism. The mean length of stay was 12.12 ± 9.7 days. The mortality rate was 3.1 % (n=1).

Conclusion: Stroke and drug use is in full swing in the world and the emphasis should be on a prevention policy including craving withdrawal**.**

Keywords: Stroke, Cannabis Use, Cigarette Smoking, Alcohol Consumption, Burkina Faso.

Introduction

Stroke is a leading cause of death, disability, and dementia globally with 87% of the burden being borne by low- and middle-income countries [1]. In several studies from the West African sub-region, stroke emerged as the leading cause of adult neurological admissions, constituting up to 65% of such admissions [2]. Studies have shown that >90% of the stroke burden is attributable to modifiable risk factors, such as tobacco smoking, alcohol consumption, poor diet, low physical activity, and hypertension [3-5]. Despite its widespread abuse, cannabis-associated cerebrovascular disease is only infrequently reported [6]. The objective of this study was to describe the characteristic of stroke associated to alcohol, tobacco and cannabis in a tertiary hospital in Burkina Faso.

Methodology

Participants

We conducted a retrospective study on stroke patients admitted in neurology department of YOUTH during the period from January 1, 2015 to December 31, 2018. This study included stroke patients consumers of alcohol, Tabaco and cannabis. We excluded patients who had major vascular risk factors as hypertension, diabetes mellitus, and dyslipidemia. Also,

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Received: Oct 14, 2019; **Accepted:** Oct 22, 2019; **Published:** Oct 29, 2019

*This article is reviewed by "Akito I, Japan

patients with incomplete records or insufficient data were not included

Data Collection and Analysis

The variables considered were sociodemographic data (age, sex, marital status, education level, respondent's employment status, area of residence); clinical data (complaints at admission, psychoactive substances consumption, history of previous stroke, family history of stroke, vascular risk factors, blood pressure at admission, body temperature, results of neurological examinations, withdrawal symptoms); paraclinical and etiological variables (subtypes of stroke on CT scan, topography of cerebral infarct and hematoma, results of electrocardiogram, echocardiography, cervical Doppler ultrasound and CT angiography, toxicological drug screening, blood glucose, serum creatinine, lipid profile, alanine transaminase, aspartate transaminase, stroke etiology (atherosclerosis, cardio embolism, others causes, unknown causes); and therapeutic and inhospital outcome (aspirin, statins, heparin, thrombolysis, thrombectomy, length of stay, complications, motor recovery, mortality rate**).**

Data were collected through a questionnaire by doctoral student in medicine and verified by us before inclusion. Questionnaires were checked for the completeness of information by us. Once the information was found to be complete, then it was fed into Epi-Info version 7.2.1.0. for data analysis. The results were expressed as a percentage and / or on average.

Ethical considerations

We had the authorization of the Chief of Neurology department to access to the patient's medical record. (health book, hospital register, discharge or death register). Anonymity and confidentiality were respected.

Assessment of substance exposures (Cannabis, Tobacco, and Alcohol)

Alcohol consumption was passed in g/day. Alcohol users were categorized into current users (users of any form of alcoholic drinks). 1 drink or 1 unit of alcohol=8 g of alcohol). Cigarette smoking. Smoker was defined as a person having = 1 pack-years smoked (1 pack = 20 cigarettes). Cannabis consumption was evaluated in joints

Results

A total of 32 stroke patients consumers of substances abuse were studied during a period of 3 years. Among them, 24 (75%) patients were cigarette smokers, 22 (68.8%) were alcohol drinkers and 3 (9.4%) were cannabis smokers.

Sociodemographic characteristics of patients

Nineteen (59.4%) men and 13(40.6%) women aged of 20 years to 60 years were included in this study. Tobacco, alcohol and cannabis users were majority men in respectively 79.2%, 54.5% and 100%. The majority of women was alcohol users (45%). The mean age of patients was 41.9 years. Young patients accounted for 56.2% of the study population (n = 18). The frequency of stroke was maximum in the age group 30-39 years in cigarette smokers (33.3%) and in alcohol drinkers (40.9%). All cannabis users were under 40years of age. According to occupation, housewives accounted for 31.3% of cases, followed by informal sector workers (25%) and farmers (18.8%). The level of education was unknown in 13 (40.6%) patients. Out-of-school students accounted for 57.9% (n=23). Twenty-one (65.6%) patients came from urban areas and the others from rural areas (34.4%). The patients were married in 71.9% of the cases. Three (9.4%) patients had previous ischemic stroke (all tobacco user), 2(6.3%) HIV infection and a patient hemogloninopathy SC. Table 1 gives the gender and age distribution according to toxic profile.

Psychoactive substance profile

Tobacco: The median number of pack-years was 11.5 (range 1.5–45). The consumption was 1 to 11 pack-years in 12 (54.5%) patients, 12 to 26 pack-years in 7(31.8%) patients and ≥26 pack-years in 3 (13.6%) patients. The mean duration of smoking was 7.4 years. The maximum of stroke occurred in smokers after 15 years of smoking (41.7%).

Alcohol: The mean daily consumption of alcohol was 26.9g / d (ranges: 3.3 - 67.4g / d). The consumption was 0.1 to 11 g/d in 3 (12.5%) patients, moderate drinkers (12–23 g/day) in 5 (20.8%) patients, and ≥24 g/d of ethanol in 16 (66.6%) patients. The mean duration of alcohol drinking was 6.3 years.

Cannabis: All the subjects had smoked < 20 cannabis joints in their lifetime. The average weekly consumption was 4.6 joints/d per person with extremes of 3 to 7 joints/d. Table 2 gives the duration of consumption according to substance exposure.

Table 1: Gender and age distribution according to substance exposure

	Substance exposure		
Gender	**Tobacco (n= 24)**	**Alcohol (n=22)**	**Cannabis (n=3)**
Male	19 (79.2%)	12 (54.5%)	3 (100%)
Female **Female**	5 (20.8%) 5 (20.8%)	10 (45.5%) 10 (45.5%)	0 (0
Age (years) Tobacco (n=24) Alcohol (n=22) Cannabis (n=3)			
20-29	4(16.7%)	3(13.6%)	2(66.7%)
30-39	8(33.3%)	9(40.9%)	1(33.3%)
40-49	5(20.8%)	4(18.2%)	0(0%)
50-59	5(20.8%)	4(18.2%)	0(0%)
≥60	2(8.3%)		0(0%)

Table 2: Duration of consumption according to substance exposure

	Toxic Substance		
Duration (years)	**Tobacco (n=24)**	**Alcohol (n=22)**	**Cannabis (n=3)**
Mean duration	**7.4**	**6.3**	**5**
1-5	3 (12.5%)	**10 (45.4%)**	3 (100%)
6-10	7 (29.2%)	**3 (13.6%)**	0 (0%)
11-15	**4 (16.7%)**	5 (22.7%)	0 (0%)
>15	**10 (41.7%)**	4 (18.1%)	0 (0%)

Clinical characteristics: On admission, 15 patients had consciousness disorders. Two patients had hypertension grade 3. All the patients had motor deficit with hemiplegia in 19 (59.4%), hemiparesis in 10 (31.2%) and tetraplegia in 3 (9.4%) patients. 17 (53.1%) patients had cognitive disorders, including speech disorders (82.3%) and memory disorders (17.6%). Symptoms of withdrawal were present in 4 patients (12.5%) including two cannabis user, one alcohol user and one tobacco users. The symptoms were irritability in 2 patients (6.2%), insomnia in a patient (3.1%) and anxiety in a patient (3.1%). Twenty-six patients (81.3%) had ischemic stroke, and 6 patients (18.7%) had hemorrhagic stroke. Table 3 gives the distribution of stroke subtype according to substance exposure. According to stroke subtype, investigations in ischemic stroke patents were electrocardiogram (76.9%), cardiac ultrasonography (46.1%) and cervical ultrasound (26.9%). Results showed Atrial fibrillation in 5 patients, decreased systolic ejection function in 1 patient, and tight carotid stenosis (≥70%) in 2 patients. CT angiography performed in 3 (50%) hemorrhagic stroke patients was normal in all cases. Toxicological drug screening tests were performed in in 6 (18.7%) cases to detect psychoactive substances; 3 patients tested positive (50%), all of them for cannabis only. Creatinine was available in 24 patients (75%) and was normal in all cases. Blood glucose was available in 15 patients (46.9%). It was elevated in 2 patients (13.3%). These patients were not known diabetics. The lipid profile was performed in 22 patients (68.7%). Dyslipidemia was present in 9 patients (40.9%), all of them smokers. The etiology of ischemic stroke was classified as atherosclerosis in 5 (23.1%), cardioembolism in 6 (19.2%) and unknown in 15(57.6%). The causes of hemorrhagic stroke were hypertensive in a patient (16.7%) and unknown in the remaining (83.3%). According to treatment, 5 (15.6%) patients had benefited of psychiatric treatment for the withdrawal of their dependence. Complications of stroke during hospital stay were observed in 5 patients (15.6%) including pulmonary infection (40%), pressure ulcers (40%) and thromboembolic complications (20%). The mean length of stay was 12.12 ± 9.7 days (ranges 2- 49 days). Twenty-three (71.9%) patients were discharged. Three (9.4%) patients were transferred, 75% in cardiology and 25 % in internal medicine. The mortality rate was 3.1 % (n=1). Two (6.2%) patients had totality recovered from their motor deficit, all of them were ischemic stroke patients.

Discussion

We reported 32 cases of stroke in relation to cannabis Use, cigarette smoking, and alcohol consumption. The absence of other vascular risk factors (hypertension, diabetes mellitus, previous cardiovascular disease), of infectious or noninfectious vasculitis and the association between long-term daily use and chronic infarct suggest a causal role for alcohol, tobacco and cannabis in these cases. The temporally relationship between drug use and stroke onset was unknown because of our study was retrospective. Toxicological drug screening was performed in 6 (18.7%) cases. Cannabis was the only toxic found, reported in 50 % of cases. In contrast, Barbieux [7]. in France had reported higher screening rate (99.3 %) with low dose of opiates (5.1%) and cocaine (1.3%) in addition to cannabis. In Burkina Faso, toxicological analysis was available in two laboratories. It costs about 11.43 and 15.24 euro, very expensive for patients who have to pay all their medical care. According to Sociodemographic characteristics, the majority of users of toxic substance was predominately male gender, in line with Barbieux en France [7]. According to toxic profile, men were majority in smokers [8]; in cannabis users [9]**.** The majority (52.4%) of stroke patients in relation with substance were young (< 45 years), in line with several authors [10]. The mean age (41.9 years) was similar than in the study of Barbieux in France (43 years) [7]. According to toxic subtype, the mean age can differ. For example, the mean age of cannabis users was 33±12.4 years in the study of Wolff [11]. Drug abuse has been implicated as the cause of stroke in 15-40% of stroke in the young [12]. Tabaco was the most psychoactive substance in relation with stroke, followed by alcohol and cannabis use. Cigarette smoking was associated with stroke, but contributed little to the attributable risk because of the low prevalence of smoking among west Africans [13, 14]. We reported 2 cases of stroke related to cannabis stroke in our study. Recently, there have been some case reports of stroke in cannabinoid users that are inconclusive [11, 15-19]. Cannabis was the most frequently used psychoactive substance after alcohol and tobacco, as in the report of United Nations Office on Drugs and Crime [20]. It relatively high cost than alcohol and tobacco can explain its no preference by the subjects of our sample. In our study, ischemic stroke was the leading subtype of stroke in relation with substance use, in concordance with the study of Meziani et al [21]. Among smokers, ischemic accounted for 79.2% of cases. Tobacco is a risk factor for atherosclerosis, which is itself responsible for 20-30% of ischemic stroke [22]. Among alcohol users, one noted a prevalence of ischemic stroke (81.8%). The relative risk is about 3 for cerebral infarction and 4.7 for cardioembolic AICs (RR-4.7) [23]. Regarding cannabis use, our study noted on the 3 listed cases, 2 cases of ischemic stroke and one case of hemorrhagic stroke. These results are identical to those of other authors [24-28]. Ischemic stroke is the most commonly reported adverse cardiovascular effect of cannabis use [29]. Indeed, Westover et al. found that cannabis use was a significant risk factor for ischemic stroke in a controlled epidemiology study [23]. In our study, the cause of ischemic stroke was atherosclerosis and cardio embolism and unknown in 12 patients (46.1%). Similarly, Barbieux [7] in its study found an unknown cause in 52.2% of cases, after a full review. This high frequency of indeterminate causes is linked to the fact that the search for psychoactive substance is rarely part of the etiological record of stroke, especially in the young

Table 3: Distribution of stroke subtype according to substance exposure

	Psychoactive Substance		
Stroke subtype	**Tobacco (n=24)**	**Alcohol (n=22)**	**Cannabis (n=3)**
Ischemic stroke	19(79.2%)	18(81.8%)	2(66.7%)
Hemorrhagic stroke	5(20.8%)	4(18.2%)	1(33.3%)

person. In our context, in addition to the toxicology check-up, there is a lack of exposure related to the high costs of Holter ECG and transthoracic echocardiography, which can only be performed in a single hospital. Cardioembolism causes the leading cause of ischemic stroke before atherosclerosis; most patients who do not have other major vascular risk factors (hypertension or diabetes). Atrial fibrillation was the leading cause of cardioembolism stroke. This is more than cigarette smoking is known to be an independent risk factor for atrial fibrillation and hypertension [30, 31]. Indeed, moderate and high alcohol consumption is associated with an elevated risk of atrial fibrillation, which is a risk factor for cardioembolic stroke [32], which is a risk factor for cardioembolic stroke. The association between alcohol consumption and stroke may vary with type of stroke [33]. Men tend to drink more frequently and in larger amounts than women, and women are more often lifetime abstainers [34]; these patterns are similar for adults aged 65 years and older [35]. A meta-analysis of 35 studies found lower risks of stroke for drinkers who consumed 12 g of alcohol per day compared with abstainers [36]. This pattern is consistent with previous studies that reported protective effects of alcohol for women only [37].

Study Limitations

This study had several limitations. The short size of patient sample because of incomplete data in medical record. Risk factors did not evaluate. A Case control study.

Conclusions

Both ischemic and hemorrhagic strokes are not uncommon in patients who use alcohol, tobacco and cannabis. The frequency is higher in patients under 45 years of age. Withdrawal syndrome is rare. The functional prognosis is unfavorable.

Conflict of Interest

No conflict of interest

Acknowledgments

We want to wish Dr Koura David and Mrs Zongo Carine Patricia for translation.

Sources of Funding

No source of funding.

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Citation: Dabilgou AA, Dravé A, Kyelem M JA, Sawadogo PAR, Napon C, et al. (2019) Stroke Associated to Cannabis Use, Cigarette Smoking, and Alcohol Consumption. A Hospital Based Study from Burkina Faso. J Neurol Neuro Toxicol. 3: 001-005.