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Pronostic Factors of Cerebral Toxoplasmosis in Department of Infectious and Tropical Diseases at Donka National Hospital

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Abstract

Objectives: To identify predictive factors for poor prognosis during cerebral toxoplasmosis at Donka Hospital. **Methods:** It was a retrospective study of descriptive and analytic type lasting one year six months (18 months) from January 1st, 2016 to June 30th, 2017 which involved patients admitted and hospitalized for cerebral toxoplasmosis in HIV field. Data enter was performed by Epi data 3.1 software and SPSS 21 software for statistical analysis. The threshold of significance was $p < 0.05$. **Results:** We observed 87 cases of cerebral toxoplasmosis (CT). The mean age was 38.53 ± 12.16. The clinical signs were mainly infectious syndrome (100%), headache (69.0%), confusion (46.0%) and meningeal syndrome (41.4%). The lethality was 37.9%. Living with a partner ($p = 0.007$), CD4 at initiation of antiretroviral therapy < 200 cells/mm^3 ($p = 0.009$), and coma ($p = 0.02$) were the factors associated with death. **Conclusion**: This study showed that cerebral toxoplasmosis is associated with very high morbidity and mortality in the Infectious Diseases Department of Donka National Hospital. Living in a relationship, CD4 counts at baseline < 200 cells/mm^3 and coma were independently associated with death. Special attention to these factors associated with infectious resuscitation and primary prevention in patients with a CD4 T lymphocyte count below 200 cells/mm may improve the prognosis of this pathology.

Keywords

Cerebral Toxoplasmosis, HIV/AIDS, Donka

1. Background

Toxoplasmosis has emerged as a major opportunistic disease in patients with Acquired Immune Deficiency Syndrome (AIDS). It can manifest itself as a potentially fatal encephalitis, due to the reactivation of latent infections in immune suppression associated with the human immunodeficiency virus (HIV) [1] [2]. Toxoplasmosis is at the top of the list of diseases that occur death in patients with AIDS [3]. Although the incidence of cerebral toxoplasmosis (CT) has decreased as a result of antiretroviral therapy (ART), it is still a serious diagnostic and therapeutic problem and a life-threatening condition [4]. Death proportion among toxoplasmosis in AIDS patients is estimated at around 10% in the United States and up to 30% in Europe [3]. Associated factors and likelihood survival characteristics of toxoplasmic encephalitis in the era of antiretroviral therapy have not been addressed in our context. Knowledge of these factors could help improve the survival of PLHIV. The objective of our study was to identify predictive factors for poor prognosis during cerebral toxoplasmosis in the field of HIV infection.

2. Material and Methods

2.1. Study Setting and Design

The Infectious Diseases Department at Donka National Hospital served as our study. It is one of the referral services in the treatment of HIV in the Republic of Guinea.

This was a retrospective study of descriptive and analytical type lasting one year six months from January 1, 2016 to June 30, 2017.

2.2. Study Population

The study looked at the records of patients admitted and hospitalized for cerebral toxoplasmosis in HIV field at SMIT at Donka National Hospital.

2.3. Inclusion Criteria

We included patients with cerebral toxoplasmosis on HIV field received and hospitalized at the SMIT of Donka National Hospital during the study period.

2.4. Definition Criteria

The diagnosis of cerebral toxoplasmosis was retained in an HIV-infected patient with a CD4 count of less than 200 cells/ml, combining intense headaches resistant to usual analgesics, unexplained fever, and focal neurological deficit (hemiplegia or hemiparesis), a syndrome of intracranial hypertension, a disorder of consciousness (agitation, obnubilation, temporal-spatial disorientation, coma).

Cerebral CT revealing one or more images of hypodensity circled by a contrast enhancement (cockade), or hyperdensity.

In cases where imaging was not available, good evolution with Cotrimoxazole allowed the diagnosis of CT to be retained.

2.5. Data and Measures

Socio-demographic characteristics information (age, sex, marital status, residence), antecedents (CD4 and hemoglobin levels at treatment initiation, primary cotrimoxazole prophylaxis), clinical signs (general signs, neurological signs), paraclinical data (toxoplasmic serology and magnetic resonance imaging), treatment and outcome (healed, deceased, referred) were collected in all patients.

2.6. Data Analysis

Data enter was performed by Epi data 3.1 software and SPSS 21 software for statistical analysis.

Proportions were calculated for the qualitative variables. Quantitative variables were presented as mean ± standard deviation. Comparison of proportion was performed by chi2 test or exact fisher. The Student's test was used for the comparison of averages. Univariate analysis and multivariate logistic regression were used to search for factors associated with death. Only variables whose value of p-value was less than or equal to 0.20 in univariate were taken into account in the multivariate analysis. The threshold of significance was set at $p < 0.05$.

2.7. Ethical Consideration

Ethical clearance was obtained from the University of Conakry. Participants were informed that the information collected for this research project were kept confidential and information about collected by this study will be stored in a file, without their name, but code number assigned to it.

3. Results

Socio-economic demographic and clinical characteristics

During our study period, 495 patients were hospitalized at the Department of Infectious and Tropical Diseases at national hospital of Donka are not 87 years old for cerebral toxoplasmosis in the field of HIV or 17.58%.

The characteristics of all patients are described in Table 1.

Cerebral toxoplasmosis was indicative of HIV infection in 43.7% of patients. The clinical picture was dominated by headache (69.0%); focal neurological signs including seizures (28.7%) followed by hemiplegia (21.8%) and hemiparesis (20.7%). All patients presented Infectious syndrome.

In the assessment of the state of consciousness 46.0% was in a state of confusion and 21.8% in a coma. More than half (78.2%) of those present have opportunistic infections, including gastrointestinal candidiasis (20.7%), pulmonary tuberculosis (10.3%), genital herpes (6%), 9%), Kaposi's disease with a proportion of 2.3%. Forty-five patients were cerebral computed tomography 45/87% (Table 2). Among 87 cases of cerebral toxoplasmosis, we observed 33 deaths, a hospital mortality of 37.9% (Table 3).

Factors Associated with the Death of Patients with Cerebral Toxoplasmosis

Univariate analysis shows that patients living with a partner, on patients with

Table 1. Sociodemographic characteristics of patients with cerebral toxoplasmosis and positive HIV screening for infectious and tropical diseases in Donka National Hospital.

Categories	Frequency	Percent (%)
Sex		
Male	45	51.7
Female	42	48.3
Mean age ± standard deviation	38.53 years ± 12.16	
Residence		
Urban	65	74.7
Rural environment	22	25.3
Marital status		
Married	57	65.5
Single	22	25.3
Divorced/Widowed	8	9.2

Table 2. Distribution according to the antecedents, the clinical and paraclinical characteristics of patients with cerebral toxoplasmosis on the ground of HIV infection at the service of infectious and tropical diseases of Donka National Hospital.

Clinical and Paraclinical Characteristics	Frequency	Percent (%)
Toxoplasmosis indicative of HIV infection (N = 87)		
Yes	38	43.7
No	49	56.3
CD4 count at initiation of ART (N = 87)		
<200	66	75.9
≥200	21	24.1
Primary prophylaxis with cotrimoxazole (N = 87)		
Yes	17	19.5
No	70	80.5
hemiparesis	18	20.7
Hemiplegia	19	21.8
Seizures	25	28.7
headaches	60	69,0
vomiting	19	21.8
Visual disorders	18	20.7
Infectious syndrome (N = 87)	87	100
Discrete stiffness of the neck (N = 87)	36	41.4
Confusion	40	46.0
Coma	19	21.8

Continued

Opportunistic infections		
Digestive candidiasis	18	20.7
Genital herpes	6	6.9
Pulmonary tuberculosis	9	10.3
Kaposi Disease	2	2.3
Toxoplasmic serology (N = 20)		
IgG	8	40
IgM	12	60
Cerebral computed tomography (N = 87)	45	51.72

Table 3. Distribution according to the therapeutic and pronostic characteristics of patients with cerebral toxoplasmosis in the field of HIV infection at the service of infectious and tropical diseases of Donka National Hospital.

Caractéristiques	Effectif	Pourcentage
Hospital etiological treatment (N = 87)		
Cotrimoxazole	84	96.6
Pyrimethamine and Sulfadiazine	3	3.4
Prognosis (N = 87)		
death	33	37.9
Healed/Enhanced	46	52.87
Average length of hospital stay	8	9.19
Average length of hospital stay	16.78 ± 16.30	

Table 4. Factors Associated with the Death of Patients with Cerebral Toxoplasmosis in the Field of HIV Infection at the Service of Infectious Diseases at Donka National Hospital.

	Univariate		Multivariate	
	OR (95% IC)	P-value	Adjusted OR (95% CI)	P-value
Age (continued)	1.01 [0.98 - 1.05]	0.39		
Sex				
Male	1.78 [0.74 - 4.30]	0.19	1.64 [0.46 - 5.86]	0.44
Female	Reference		Reference	
Marital status				
in a relationship with	6.73 [2.08 - 21.77]	0.001	9.93 [1.89 - 52.03]	0.007
No In a relationship	Reference		Reference	
Residence				
Urban	0.70 [0.25 - 1.95]	0.49		
Rural environment	Reference			
Toxoplasmosis indicative of HIV infection				

Continued

Yes	0.61 [0.25 - 1.49]	0.28		
No	Reference			
CD4 count at initiation of ART (N = 87)				
< 200	18.82 [2.38 - 148.51]	0.005	19.04 [2.11 - 171.32]	0.009
≥ 200	Reference		Reference	
Primary prophylaxis with cotrimoxazole				
Yes	0.43 [0.12 - 1.47]	0.18	1.02 [0.20 - 5.21]	0.97
No	Reference		Reference	
Hemiplegia				
Yes	0.51 [0.16 - 1.57]	0.24		
No	Reference			
Hemiparesis				
Yes	0.77 [0.26 - 2.32]	0.65		
No	Reference			
Crises convulsives				
Yes	0.53 [0.19 - 1.47]	0.22		
No	Reference			
Headaches				
Yes	1.05 [0.41 - 2.70]	0.90		
No	Reference			
Vomiting				
Yes	1.25 [0.44 - 3.52]	0.67		
No	Reference			
Visual disorders				
Yes	0.39 [0.11 - 1.32]	0.13	0.66 [0.13 - 3.29]	0.61
No	Reference		Reference	
Discreet Stiff neck				
Yes	1.31 [0.54 - 3.14]	0.54		
No	Reference			
Confusion				
Oui	1.74 [0.72 - 4.18]	0.21		
Non	Reference			
Coma				
Yes	3.83 [1.32 - 11.12]	0.01	5.18 [1.25 - 21.42]	0.02
No	Reference		Reference	
Anemia (hemoglobin)				
<8	1.03 [0.40 - 2.65]	0.94		
≥8	Référence			

a CD4 count on the initiation of antiretroviral treatment < 200 cells/mm^3 and on the history of risk during hospitalization. Multivariate analysis, of couple living, CD4 counts at inclusion < 200 cells/mm^3 and coma were independently associated with death. The risk of death was nearly 10 times higher for living than for those living alone (OR = 9.93 [1.89 - 52.03], p = 0.007). Patients with a CD4 count at initiation of antiretroviral therapy < 200 cells/mm^3 were 19 times more at risk than those with a rate ≥ 200 cells/mm^3 (OR = 19.04 [2.11 - 171.32] p = 0.009). Comatose were 5 times more likely to die than non-comatose (OR = 5.18 [1.25 - 21.42], p = 0.02).

The proportion of deaths is significantly different between patients with a CD4 count < 200 and those with a CD4 count ≥ 200 (p = 0.009) (**Table 4**) at the time of HIV testing.

4. Discussion

Aim of this study was to identify the predictive factors for poor prognosis during cerebral toxoplasmosis in the service of infectious diseases at the Donka National Hospital. During six months, we found 87 cases of cerebral toxoplasmosis out of a total of 495 cases, with 17.58% of hospital frequency.

It is reported in the literature that relates to the state of the nervous system. It is 10% to 20% of cases, and more than 50% of AIDS patients [5]. Other authors found in Côte d'Ivoire in 2007 16% of cases of cerebral toxoplasmosis [6].

This result denoted delayed diagnosis of HIV in the part and adherence to primary prophylaxis with cotrimozaxole of another party.

Thirty-three cases (33) of deaths were observed with 37.9% as hospital lethality. Studies in Morocco and Cameroon have revealed respective proportions of lethality of 28.57% and 29.9% [7] [8]. These proportions though we will be maintained until our highly active antiretroviral therapy.

This high proportion of mortality was explained after a late diagnosis of the infection, once detected in patients to believe in the disease; this situation associated with the side effects of ARVs causes some patients to consult traditional healers.

Several previous studies of HIV patients on antiretroviral therapy use traditional medicine [9]-[14]. This stay with the healers results in the degradation of the immunity, the appearance of resistance to the treatments leading these patients to the AIDS stage. Finally, it is difficult for parents to honor the prescriptions seen by patients in transit, often with traditional healers or in the labor market. Sanitary facilities not adapted to the management of the base of the financial exhaustion before their admissions to the service of reference.

Multivariate analysis, of couple living, CD4 counts at initiation < 200 cells/mm^3 and coma were dependently associated with death.

The authors of a study conducted in Senegal in 2013 found that anemia (p = 0.003), high CD8 + T cell count (p = 0.009) and coma (p = 0.02) were associated factors at death of PHAs with toxoplasmos [15].

The risk of death was 19 times higher in people with a CD4 count < 200 cells/mm^3 at initiation of ART. At this stage, the patient is in a state of advanced immune suppression (AIDS) exposed to serious opportunistic infections, moreover, we often see the appearance of several opportunistic infections and this state would lead to death.

The results also showed that comatose were 5 times more likely to die during the stay than non-comatose. The coma denotes a serious encephalic attack we attend an impossibility for the patient to eat. In the absence of adequate resuscitation, we witness the installation of a vicious circle. Lack of adequate nutrition in a previously undernourished patient further weakens the immune system, making this group of patients more likely to die.

Despite the interesting results of this study, it has limitations. Its retrospective nature did not make it possible to know the future of the referred patients, it also did not make it possible to find certain information notably the demonstration of the nonobservance to the TAR, the delay in the diagnosis and the recourse to the triple therapy of the patients.

5. Conclusion

This study showed that cerebral toxoplasmosis is associated with very high morbidity and mortality in the Infectious Diseases Department of Donka National Hospital. Living in a relationship, CD4 counts at baseline < 200 cells/mm^3 and coma were independently associated with death. Special attention to these factors associated with infectious resuscitation and primary prevention in patients with a CD4 T lymphocyte count below 200 cells/mm may improve the prognosis of this pathology.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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