Original Research Article

Rabiesrisk in people bitten by warm-bloodedanimals:epidemiological and prophylactic aspects at the epidemictreatment center of the Kindia regionalhospital (CT-Epi /HRK), Guinea

ABSTRACT:

Introduction : The objective of thisworkwas to describe the epidemiologicalcharacteristics and prophylactic management of patients afterexposure to the risk of rabies infection at the CT-EPI of the Kindia regionalhospital.

Material and methods: The data werecollectedretrospectively over 5 years 10 months (fromJanuary 1, 2014 to October 2019) and covering all usable files of people whoconsulted for bites, scratches or licks on mucous membranes or skin eroded by an animal. warmblood, domestic or wild, showingobvious or non-obvioussigns of rabies.

The study variables wereepidemiological, clinicalthenprophylactic and concerned the biting animal, the bittenperson and the therapeuticregimenused for the prevention of rabies infection.

Results:FromJanuary 2014 to October 2019, 415 patients exposed to rabiesriskwerereceived at the epidemictreatment center of the Kindia regionalhospital. The averageage of the patients was 25 yearswith the extremes of 1 and 90 years and the sex ratio (M/F) was 1.18. The dog wasresponsible for most cases of risk of rabies infection (91.81%), the bite was the main reason for consultation (91.81%). The foot was the site of the bite in 84.34% of cases. A large proportion of exposedsubjects (42.89%) weretreatedwithin 24 hoursfollowingtheirexposure. Almost all patients benefitedfrom the Zagreb protocolwith a post-exposureprophylaxis (PEP) dropout rate of 39%.

Conclusion : Straydogs are responsible for the majority of bites. The Zagreb protocolwasusedmuch more often for the treatment of exposed people in order to eliminate the risk of rabies.

Key words*: Rabiesrisk, treatment, CT-Epi of Kindia, Guinea.*

1- INTRODUCTION:

The risk of rabies is the mode of contamination which is most often caused by biting, but also by scratching or licking on damaged skin [1].

Despite therapeutic research, declared rabies is an always fatal encephalomyelitis, against which the only weapon remains either preventive vaccination of exposed people, or curative vaccination associated or not with serotherapy from the supposed accidental inoculation of the virus [2].

Rabies is one of the neglected tropical diseases mainly affecting already marginalized, poor and vulnerable populations. Although there are effective vaccines and immunoglobulins for humans, these products are often not readily available or accessible to those who need them [3].

Management after exposure follows stereotypical attitudes and requires emergency medical and surgical treatment alone, likely to stop an abscess [4]. It must always begin without delay with local wound care in order to eliminate or prevent the virus from entering the body. After very careful washing with soap and water for at least 15 minutes, an antiseptic must be applied followed by vaccination and +/- administration of anti-rabies immunoglobulins [5].

Worldwide, between 6.5 and 12 million post-exposure prophylaxis (PEP) are administered each year [6].

In Conakry (Guinea) in 2013, Youla A.S et al reported 11 cases of human rabies among 7994 people exposed to the risk of rabies over a period of 11 years [7].

However, data on the epidemiological and prophylactic aspects of exposure to the risks of rabies infections are rare in the regions for the simple reason that there are not enough studies initiated in this area. Added to this is the lack of clear political will on the part of the authorities to make care of people exposed to risks free.

It is with this in mind that we initiated this study in order to take stock of the epidemiology and the type of care provided to people exposed to the risk of rabies infection with the aim of:

Describe the epidemiological characteristics and methods of preventive care of patients after exposure to the risk of rabies infection at the CT-EPI of the Kindia regional hospital.

2- METHODOLOGY

We conducted a retrospective, descriptive study over a period of 5 years 10 months (January 1, 2014 to October 31, 2019) at the epidemiological treatment center (CT-Epi) of Kindia in collaboration with the private veterinary practice of the place which should receive all animals suspected of having rabies or not, responsible for lesions suspecting a risk of rabies infection in the population. This CT-Epi, in addition to its role dedicated to the management of various epidemics in the region, also represents the region's infectious diseases unit and therefore a reference center for the therapeutic and preventive management of certain infectious diseases. including human rage. Kindia is one of the administrative regions of Guinea located 113 kilometers from Conakry, with an area of 28,875 km2 with a density of 54 inhabitants per km2. The Kindia region brings together five prefectures (Coyah, Dubréka, Forécariah, Kindia and Télimélé).

Usable files were included in this study (including the name of the animal, the care administered to the patient, degree of severity of the injury, vaccination protocol used, number of vaccines administered and fate of the animal responsible for the exposure) of patients of all ages, genders and origins admitted for risk of rabies infection during the study period.

We have called rabies risk any person admitted to a consultation for a bite, but also for scratching or licking on skin damaged or not by a warm-blooded animal.

For data collection, we carried out an exhaustive recruitment of all cases of exposure to the risk of rabies infection notified in the department during the period considered.

The study variables were:

Epidemiological: total number of cases over the study period and the annual number of cases;

Clinic:

♣ Animal involved: Vaccination status, lifestyle (domestic or stray), type of animal (dog, cat, etc.);

♣ Bitten subject: type of contact, degree of injury, site of injury.

Therapeutic: type of care, anti-rabies vaccination protocol used, number of doses administered.

Data entry and analysis were carried out using EPI data software in version 3.1 and SPSS software in version 21, then processed by Microsoft Word and Excel 2013 software.

3- RESULTS

From January 1, 2014 to October 31, 2019, we collected 415 patients exposed to the risk of rabies and who consulted the CT-Epi of Kindia and the year 2014 (1st year of investigation) recorded the highest number of cases with 116 (27 .96%) (Fig1).

The average age of the patients was 25 (± 15.80) years with a male predominance, i.e. a sex ratio of 1.18. Singles were the most affected in 260 cases (62.65%) with a low number of cases. Almost all of the patients (349 cases) lived in urban areas and the Kindia area was home to 343 cases (Table I).

The dog was the main animal involved in 381 cases (91.81%), followed by the monkey in 29 cases (6.99%). Less than half of the dogs (44.10%) were domestic and only 16/415 dogs (i.e. 3.85%) were regularly vaccinated according to the owners (Table II).

The bite was found in 381 patients, or 91.81%, and it was category III in nearly a third of cases, or 35.18%. The site of the bite was on the lower limbs in 350 cases (84.34%) (Table III).

Nearly half (42.49%) of the patients were treated within 24 hours and the majority of patients (60.99%) took the full four (4) doses recommended by the Zagreb vaccination protocol with a 39.01% dropout rate from rabies post-exposure prophylaxis. Almost all of the patients, i.e. 405 (97.60%), were put on antibiotics including amoxicillin-clavulanic acid in 250 patients (60.24%) followed by amoxicillin in 155 patients (37.35%). (Table IV).

3- DISCUSSION:

We conducted a retrospective study lasting 5 years 10 months from January 2014 to October 2019 focusing on the epidemiology and therapeutic management of the risk of rabies infection in people bitten by warm-blooded animals in epidemic treatment center of the Kindia regional hospital (CT-Epi /HRK), Guinea.

Despite the retrospective nature, the absence of monitoring of the evolutionary outcome of people exposed to the risk of rabies infection in the long term, this study allowed us to understand the extent of the phenomenon and the type of care administered to these people exposed due to injury to warm-blooded animals.

We collected 415 people exposed to the risk of rabies infection at the CT-Epi of the Kindia regional hospital during the study period. It should also be noted a significant reduction in cases over the years, going from 116 cases in 2014 to 46 cases in 2019, a reduction of more than half of cases.

This could be explained by under-reporting linked to non-free healthcare, the high cost of the rabies vaccine which is not within the reach of middle- or low-income citizens, but also the absence of a good policy. information, education and communication on the risk of rabies for these people living outside Conakry, the Guinean capital.

The average age of our patients was 25 years with extremes of 1 and 90 years and the age groups most affected are those from 0 to 10 years (62.65%) followed by 11 to 20 years (26 .99%).

These results are superimposable to those of Dao S. et al. in Mali and Sylla K et al in Senegal who found a clear predominance of cases in these two age groups [8, 9].

This clear predominance of cases (80%) among children under 15 years old could be explained by their immaturity, lack of awareness of the danger linked to dogs in general and stray dogs in particular and also the decline in parental control over children. after classrooms therefore making them more vulnerable to the risk of injury by these warm-blooded stray animals.

Men were the most affected with 54%, or a sex ratio of 1.18.

This result is superimposable to those of Youla in Guinea and Sylla K in Senegal [7,9] and different from those of Marta D M et al who noted a female predominance of 53% [10].

The male predominance could be explained by the fact that boys are the most mobile, turbulent and can move away from the family home for their leisure activities and therefore more exposed to contact with stray animals including dogs which are the potential culprits of these rabies risks by biting, scratching or licking mucous membranes or damaged skin

In our study, pupils and students were more affected with 59.76%. Other authors have reported similar results [8, 11,9].

The majority of patients (82.65%) came from the urban area of Kindia.

Similar results were reported in Bamako and Dakar by Dao S and Sylla K [8,9].

This observation could be explained by the fact that populations in urban centers are more informed about the risk of rabies than those in rural areas and consult a health facility for appropriate rabies prevention care as soon as there is exposure to the risk. Also, the urban area

constitutes the ideal place for the proliferation of stray animals in hot weather, including dogs with a much greater risk of rabies, especially since there is no policy of health control or slaughter of stray dogs.

In almost all cases (91.81%), the biting animal involved was the dog.

This result is superimposable to those found in Bamako (97.7%), Abidjan (90.8%), Dakar (89%) and Conakry (99.4%) [7, 8, 9,11].

This state of affairs is consistent with the literature which states that the dog is the animal most implicated in the occurrence of human rabies [12].

No biting animal involved was observed for veterinary follow-up.

This result is similar to that of Sylla K [9] and different from that of Youla et al in Guinea where 36.5% of biting dogs were observed [7].

This could be explained by the fact that not only more than half of the biting animals were stray and therefore inaccessible, but also by the fact that domestic biting animals are more or less followed according to the owners' statements because they are not documented and also the reluctance of owners of these animals for sending to veterinarians. However, the only way to know if a biting animal could be excreting the rabies virus in its saliva, at the time of the bite, is to put it under observation and check if it remains healthy in the following days.

However, collaboration with veterinary medicine is essential to achieve the objectives of the WHO and it has been proven that the vaccination of more than 70% of the dog population would eliminate rabies in both dogs and humans [13].

The bite represented the most frequent lesion (91.81%) and in almost 2/3 of cases (62.41%) the bite was category II.

These results corroborate with those found by other authors [7, 14,15].

The site of the bites was mainly located on the lower limbs in 84.34% of cases.

Similar results were reported by Sylla K [9] Abdillahi AM (90.67%)[16], Diallo MK (88.7%)[17] and Dangba BC (86%)[18],

This state of affairs could be explained by the fact that the lower limbs are the most accessible parts of the body for the biting animal.

More

Than 42.89% of exposed subjects were treated within 24 hours following their exposure.

This result is higher than that of Dao S in Bamako who reported that only 18.8% of bitten subjects went to a health facility in the first 24 to 48 hours [8].

Nearly two-thirds of patients (66.27%) benefited from washing the wound with soap and water.

This measure is strongly recommended to reduce the risk of progression of the virus [5].

The most prescribed antibiotic was amoxicillin-clavulanic acid in 60.24%.

Almost all of the patients (98%) had started the Zagreb protocol and almost half (42.74%) had abandoned and 247 patients received the full dose of four injections, i.e. a completeness of 55.26% of cases.

Nearly 1/3 (35.18%) of the cases had a grade III injury, but none of these cases benefited from the administration of anti-rabies immunoglobulins.

This result is lower than that of Sylla K et al [9] who found 59% completeness and higher than those of Rysava K et al [15] who reported that 32.5% and Marta D M et al [10] that only 10% of patients in category II received anti-rabies vaccines and immunoglobulins simultaneously.

The almost systematic use (98%) of this protocol in our patients would be linked to its simplicity and the fact that it is less expensive compared to other protocols used in Guinea, but despite everything, the dropout rate (42.74 %) which remains very high would be linked to the inaccessible cost of the vaccine for average-income citizens on the one hand, but also to a lack of conviction of the risk incurred by these people. The non-use of immunoglobulins in people with grade III injuries would be linked to its unavailability in this region at this date.

Nearly 40% (158/415) of patients were lost to follow-up.

This state of affairs did not allow us to understand the medium or even long term evolution of these patients, especially for the majority of them incompletely or not vaccinated.

Competing interests: The authors have declared that no competing interests exist

Links of interest: The authors declare that they have no links of interest

Consent: This is not applicable

Ethical Approval: The study protocol was approved by the ethics committee of the Faculty of Health Sciences and Technology of the Gamal Abdel Nasser University of Conakry.

The anonymity and confidentiality of patients were respected.

Disclaimer (Artificial Intelligence): No generative AI technologies such as large language models (ChatGPT, COPILOT, etc.) and text-to-image generators were used in the writing or editing. edition of this manuscript.

Author contribution: all authors contributed to the development of this manuscript

TABLES and FIGURES

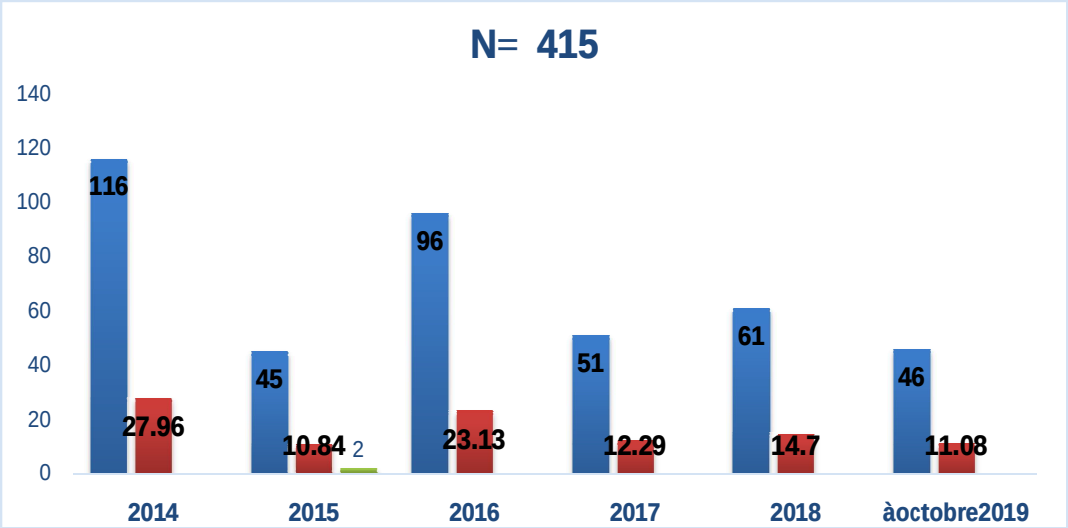

Figure 1 : Annual incidence of 415 subjects exposed to rabies risk and treated at the Kindia CT-Epi from 2014 to 2019

Table I: Distribution according to sociodemographic characteristics of the 415 people exposed to rabies risk during the study period at CT-Epi in Kindia, Guinea

Characteristics	Number(N=415)	Proportion(%)
AverageAge	25 (± 15,80) ans	
Sex		
Male	224	54
Sex ratio M/F	**1,18**	
Marital status		
Bachelor	260	62,65
Married	99	23,86
Others	56	13,49
Level of study		
Low level	332	80
Secondary	54	13,01
Academic	29	6,99
Occupation		
Pupil/Student	248	59,76
Liberal	99	23,86
Employee	15	3,61
Housewife	53	12,77
Residence		
Kindia	343	82,65
Othersprefectures	72	17,35
Type of residence		
Urban	349	84
Rural	66	16

Table II: Distribution according to the profile of the biting animal of the 415 people exposed to the risk of rabies during the study period at the CT-Epi of Kindia, Guinea

Profile	Number (N=415)	Proportion(%)
Animal in volved		
Dog381	91,81	
Cat29	6,99	
Monkey 5	1,20	
Behavior of the animal in question		
Restless 287	69,16	
Slow motion 51	12,29	
Normal	77	18,55
Animal rabies vaccination status involved		
Vaccinated 16	3,85	
Unvaccinated 399	96,15	
Situation of the biting animal		
Domestic183	44,10	
Wandering232	55,90	

Table III: Distribution according to the characteristics of the lesion among the 415 people exposed to the risk of rabies during the study period at the CT-Epi in Kindia, Guinea

Lesion characteristics	Number	Percentage %
Contact type		
Bite 381	91,81	
Scratch 25	6,02	
Licking9	2,17	
Seat		
Lowerlimb 350	84,34	
Upperlimb 52	12,53	
Trunk11	2,65	
Head 2	0,48	
Category		
Category II	259	62,41
Category III	146	35,18
Category I	10	2,41

Table IV: Distribution according to type of care of the 415 people exposed to rabies risk during the study period at CT-Epi in Kindia, Guinea

Type of care	Number (N=415)	Proportion(%)
Locale care		
Washingabundantlywith soap and water	275	66,70
Application of 70° alcohol	140	33,73
Delivery time		
The first24 hours	178	42,89
24 to 48hours	142	34,21
From 48 to 72 hours	41	9,88
>72 hours	54	13,01
Rabies vaccine doses		
Vaccination not offered	10	0,00
1 dose	17	4,20
2 doses	52	12,84
3 doses	89	21,97
4 doses	247	60,99
Antibiotictherapy		
Amoxicillin- clavulanic Acide	250	60,24
Amoxicillin	155	37,35
Withoutantibiotic	10	2,41
Evolution		
Improved	257	61,93
Lost to follow-up	158	38,7

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