

Knowledge of Health Personnel on Human Anti-Rabies Treatment Before and After Exposure in the City of Ouagadougou, Burkina Faso

Savadogo Mamoudou^{1*}, Ouédraogo Parfait¹, Diallo Ismaël², Sondo K Apoline¹ and Kouéta Fla³

¹Department of Infectious Diseases of the YalgadoOuédraogo University Hospital Center, and UFR / SDS of Joseph Ki Zerbo University, Burkina Faso

²Internal Medicine Department of YalgadoOuédraogo University Hospital, Burkina Faso

³UFR / SDS of Joseph Ki Zerbo University, Burkina Faso

Abstract

Prophylaxis before and after exposure to rabies risk is a major strategy in the fight against human rabies.

Objective: Analyze the knowledge of first-level health personnel on human anti-rabies treatment before and after exposure in the city of Ouagadougou.

Patients and Methods: We conducted a descriptive and analytical cross-sectional study that took place in public and private care facilities in the city of Ouagadougou.

Results: One hundred and sixty-nine first-level care workers from the city of Ouagadougou were involved. Overall, 44.22% of workers' responses were consistent with the WHO recommendations for antirabies treatment. More specifically, only 27.8% of all-category workers knew that anyone at risk of rabies needed rabies vaccination before exposure. For post-exposure prophylaxis, 78.1% of the agents, regardless of their qualification, practiced washing / rinsing with soap and immediately disinfected the suspicious wounds. The proportion of non-WHO response was higher among staff with less than 15 years of length of service ($p < 0.001$). The proportion of non-compliant responses to WHO recommendations was 56.2% for category III exposure, 84% for Category II exposures and 55.6% for Category I exposures. Non-conformity was higher among staff with a length of service less than 15 years for Category II and III exposures. For Category I exposures, the responses did not vary according to the length of service of the agents. These bad answers reflect a lack of knowledge about rabies. Indeed, 66.3% of the agents knew that rabies is of viral origin, 30.8% knew the mode of transmission of rabies, 1.8% knew the duration of the incubation period of rabies while 37.3% thought that we could cure human rabies. It is urgent to retrain health workers on anti-rabies prophylaxis.

Keywords: Rabies; Prophylaxis; Knowledge; Practice; Health worker

Introduction

Rabies is a viral zoonosis caused by a Lyssavirus that causes an ever-fatal encephalitis [1]. Globally, it ranks 10th among deadly infectious diseases [2]. It affects more than 150 countries worldwide and kills 55,000 people a year [3]. These deaths, reported as being due to rabies, are probably far below the reality in several enzootic countries, because of the difficulty of confirming the diagnosis of the disease. About 98% of human rabies cases occur in areas with a high dog population where many stray dogs are found [4]. If all age groups are concerned, rabies affects mostly children under 15 years old [5]. Rabies remains a public health problem in Burkina Faso. The bites of animals, in this case those of the dog, are relatively frequent, and are very often the preserve of stray dogs exposing the victims to rabies. In countries such as Thailand, mass vaccination of dogs and widespread post-exposure prophylaxis have contributed to a significant reduction in deaths from human rabies. Post-exposure prophylaxis is estimated to prevent 330,304 deaths annually in Asia and Africa [4].

The fight against this disease is confronted with the ignorance of the populations on the one hand, and on the other hand the poor accessibility, both geographical and financial, of vaccines and immune globulin anti-rabies. In view of the seriousness of rabies, special measures must be taken to prevent this disease in humans as well as in animals. In front of a suspicious bite, any failure of care can put you at risk for rabies. That is why we conducted this study with the objective of analyzing the knowledge of the health staff on human anti-rabies treatment before and after exposure in the city of Ouagadougou.

Patients and Methods

Our study took place in the city of Ouagadougou, capital of

Burkina Faso. It is divided administratively into 12 districts and 55 sectors. On the sanitary level, it is divided into 5 health districts: Baskuy, Bogodogo, Boulmiougou, NongrMassom and Sig Noghin. 73 public and private health facilities were involved. We conducted a cross-sectional descriptive and analytical study that took place from April 7 to May 28, 2014 in public and private health care facilities in the city of Ouagadougou. Heads of health stations were included as well as health workers on duty for consultation on the day of our visit, representing at least two workers per first-level health facility. The staff of the anti-rabies treatment center of the city of Ouagadougou (health service) of the Municipality and any health worker who was not consenting after explanation of the reason for study were not included. The data collection was done by a survey using individual collection cards, including the variables studied. Exposure categories and WHO standards for anti-rabies are presented in the following (Table 1). The data entry and analysis were done using a microcomputer using IBM SPSS Statistics 20 software. The χ^2 -test was used for statistical analysis. A value of p less than 0.05 was considered significant.

***Corresponding author:** Savadogo Mamoudou, Department of Infectious Diseases of the YalgadoOuédraogo University Hospital Center, and UFR / SDS of Joseph Ki Zerbo University, Toma, Burkina Faso, Tel: 0022670259154, E-mail: savadoma@hotmail.com

Received October 05, 2020; **Accepted** October 19, 2020; **Published** October 26, 2020

Citation: Mamoudou S, Parfait O, Ismaël D, Apoline SK, Fla K (2020) Knowledge of Health Personnel on Human Anti-Rabies Treatment Before and After Exposure in the City of Ouagadougou, Burkina Faso. J Neuroinfect Dis 11: 303.

Copyright: © 2020 Mamoudou S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Categories	Nature of contact with a wild or domestic animal believed to be rabid, or of which rabies has been confirmed, or an animal that can not be placed under observation	Recommended treatment
I	Contact or feeding of the animal, licking on intact skin	- No reliable anamnesis can be obtained
II	- Bitten exposed skin - Benign scratching or excoriations without bleeding - licking on eroded skin	- Administer the vaccine immediately- Stop the treatment if the animal is healthy after 10 days of observation or if after euthanasia, the rabies research by the appropriate laboratory techniques is negative
III	- Bites or scratches through the skin - Mucosal contamination by saliva (licking)	- Immediate administration of immunoglobulins and rabies vaccine - Stop the treatment if the animal is healthy after 10 days of observation or if after euthanasia the search for rabies by the appropriate laboratory techniques is negative

Table 1: Exposure categories and WHO standards for anti-rabies.

Results

Sociodemographic characteristics of health workers surveyed

A total of 169 first-level health workers had been involved. The female sex was in the majority with a sex ratio equal to 0.67. Nurses and midwives accounted for 63% of all staff. These workers were working in 39 private structures and in 34 public structures. Moreover, 41% of them had a length of service less than 10 years.

Knowledge of workers on anti-rabies prophylaxis

Out of the health workers surveyed, regardless of their length of service, 16% were unaware that a rabies vaccine was available. Regardless of their category, 27.80% of the surveyed workers were familiar with the anti-rabies vaccine regimen. Most of the workers surveyed (96.4%), regardless of their category and length of service, did not know the place of injection of the rabies vaccine. The majority (88.80%) of the interviewees were unaware that there were no contraindications to anti-rabies treatment if modern vaccines were used regardless of their socio-professional category and length of service. Almost all the health workers interviewed (98.80%) did not know the method of administration of anti-rabies serum regardless of their category and length of service. Tables 1 and 2 present the percentage of correct response, all agents combined. Regardless of the qualification of the agents, only 27.8% knew that anyone practicing a profession at risk of rabies should benefit from vaccination against rabies. Most agents (78.10%), regardless of their qualification, practiced washing / rinsing with soap and immediate disinfection in the face of a suspicious injury. More than half of health workers (78.10%), regardless of work experience, knew how to treat a suspicious injury. Most health workers, regardless of qualification, were unaware that after Category III exposure, SAR (Anti-Rabies Serum) + VAR (Anti-Rabies Vaccine) was required, with 56.2% of non-compliant responses. 84% of health workers surveyed, regardless of qualification, were unaware that VAR alone should be used for Category II exposure. More than half of the surveyed workers, or 55.6%, were unaware that in the case of Category I exposure, no treatment should be undertaken if the story is credible (Tables 2 and 3). Tables 4-8 present the percentages of correct answers according to the professional categories of agents.

Comments

Rabies is endemic in more than 150 countries, including Burkina Faso [4]. Traditional rabies control strategies include vaccination of domestic dogs, removal of wild reservoirs by oral vaccination, and vaccination of humans before and after exposure to rabies risk. Human health workers play an important role in this fight by tracking, taking care of exposure cases and monitoring the disease. With the aim of contributing to the fight against rabies in Burkina Faso, we conducted this study, which aimed to analyze the knowledge of first-level health care workers on anti-rabies treatment before and after exposure in the

Items	Level of Knowledge (Percentage of consistent response %)
What information should be collected on a biting animal if it is found	86.4
Rabies is due to what microorganism?	66.3
What is the duration of the incubation period of Rabies?	1.8
How is rabies transmitted?	30.8
When should antirabies serum (S.A.R) be administered to a subject?	35.5
Knowledge of the "Essen" protocol	0.6
Knowledge of "Zagreb" protocol	27.8
Where do we administer rabies vaccine (injection site)	3.6
Do you think we can prevent human rabies?	84
According to you who should benefit from treatment before exposure (prevention) to rabies risk:	27.8
Can we mention the diagnosis of rabies in the absence of a trace of bite or scratch	42
Can we cure rabies	37.3
Contraindications to antirabies	11.2

Table 2: Level of knowledge of health workers in the management of rabies (N=169).

Items	Level of knowledge (consistent response %)
What do you do with the biting animal if it is shot?	47,3
What do you do if it is a stray animal?	59,2
Treatment of the injury	78,1
Treatment after suspicious, deep bite, scratch or mucous membrane contamination with saliva	43,8
In case of minor scratches, abrasion without bleeding or licking on injured or eroded skin	16
After touching or feeding animals or after licking on intact skin	44,4
How is anti-rabies serum administered?	1,2
Where should rabies vaccine be administered (injection site)	3,6
What do you do with the biting animal?	83,4

Table 3: Level of knowledge of health workers in the management of rabies (N=169).

Categories of Health Workers	Percentage of Correct Answer
AM	12.9%
IHW	19.4%
LN	32.3%
SCN	25.8%
SCM	9.7%

*AM = Assistant Midwife; IHW = Itinerant Health Worker; LN = Licensed Nurse; SCN = State-Certified Nurse; SCM = State-Certified Midwife.

Table 4: Distribution of agents by category and their correct answer to the question "What information about the biting animal?"

city of Ouagadougou. Despite the small size of our sample, our results raise some comments.

Categories of healthworkers	Percentage of correct Answer
AM	9.7%
IHW	19.4%
LN	22.6%
SCN	16.1%
SCM	6.5%

*AM = Assistant Midwife; IHW = Itinerant Health Worker; LN = Licensed Nurse; SCN = State-Certified Nurse; SCM = State-Certified Midwife.

Table 5: Distribution of agents by category and their correct answer to the question "What to do if the animal is stray or killed?"

Categories of healthworkers	Percentage of correct answer
AM	12.9%
IHW	19.4%
LN	32.3%
SCN	25.8%
SCM	9.7%

*AM = Assistant Midwife; IHW = Itinerant Health Worker; LN = Licensed Nurse; SCN = State-Certified Nurse; SCM = State-Certified Midwife.

Table 6: Distribution of agents by category and their correct answer to the question "When to administer anti-rabies serum to a subject?"

Categories of healthworkers	Percentage of correct answer
AM	0%
IHW	0%
LN	3.2%
SCN	0%
SCM	0%

*AM = Assistant Midwife; IHW = Itinerant Health Worker; LN = Licensed Nurse; SCN = State-Certified Nurse; SCM = State-Certified Midwife.

Table 7: Distribution of agents by category and their correct answer to the question "Do you know the Essen protocol?"

Categories of healthworkers	Percentage of correct answer
AM	9.7%
IHW	12.9%
LN	32.3%
SCN	22.6%
SCM	6.5%

*AM = Assistant Midwife; IHW = Itinerant Health Worker; LN = Licensed Nurse; SCN = State-Certified Nurse; SCM = State-Certified Midwife.

Table 8: Distribution of agents by category and their correct answer to the question "Can we prevent human rabies?"

Anti-rabies prophylaxis before exposure

Our study found that about a quarter of the officers knew that anyone at risk of rabies had to receive anti-rabies prophylaxis before exposure, regardless of their qualification. The lack of knowledge of pre-exposure prophylaxis was comparable from one health district to another and from one health facility to another. The knowledge of pre-exposure chemoprophylaxis had not changed with the length of time of the health workers, although good responses appeared high after 20 years of service. Pre-exposure rabies vaccination includes three vaccine injections on days 0, 7, and 21 or 28, with a booster one year later, and then every five years. It is formally indicated in laboratory personnel working on Lyssaviruses or on animals that may transmit them. This prophylaxis is indicated also in the veterinarians, the game guards, the animal-keepers, the personnel of the Society for the protection of animals, the slaughterhouse personnel [5]. The scientific literature details where several groups for which vaccination in pre-exposure is indicated. Thus, in Quebec, it also concerns students in veterinary medicine, the staff of the Faculty of Veterinary Medicine

exposed to the rabies virus, people handling potentially rabid bats, and travelers whose risk of exposure to diseases is high, children who are too young to understand that they must avoid contact with unknown or wild animals or to report that they have been bitten. Indeed, the highest rabies risk is found in children living in rabies enzootic areas in developing countries where 30 to 50% of rabies deaths occur among children, particularly those aged five to ten years who are particularly exposed because they are less closely supervised and like to play with dogs. In addition, because of their size, they are often bitten on the head and arms with a higher risk [6]. The use of pre-exposure prophylaxis is interesting in that it simplifies post-exposure prophylaxis (PEP) by eliminating the administration of anti-rabies immunoglobulin (RIg) and reducing the number of doses of the vaccine from 4 to 2 in case of exposure [5]. It is therefore essential to strengthen the skills of first-level health workers on pre-exposure prophylaxis, which is important for at-risk staff. Similarly, the parents of children and those at risk should be made aware of this anti-rabies prophylaxis before exposure. A subsidy for rabies vaccines is needed to support this strategy.

Anti-rabies prophylaxis after exposure

Nonspecific first-line treatment following exposure to rabies risk consists in thorough cleaning of the wound with soap and water, thorough rinsing, antiseptic application, and tetanus immunity testing, and antibiotic therapy depending on the type of lesion [4,7]. This practice was well known by the majority of agents surveyed (78.1%), but was less well known to those with length of service under 15 years. Post-exposure anti-rabies treatment was poorly known by the majority of agents, with more than 56.2% of the responses being poor. The rate of non-compliant responses was higher for Category II exposure, with 84% of incorrect responses. These poor responses also included Category I exposures with 55.6% who were unaware that no treatment should be undertaken in the case of Category I exposure. However, responses improved after 15 years of service. The knowledge of the agents after exposure to rabies risk were largely non-compliant with WHO recommendations. The majority of the agents knew of the existence of the rabies vaccine but paradoxically, very few knew the modalities of its administration. While 35.5% of staff reported knowing when to administer anti-rabies serum (SAR), only 1.2% of them knew the details of their administration. While the incubation period is used for the implementation of PEP, very few agents (1.8%) knew the duration of this incubation period, which varies from a few days to more than a year. Timbre et al in Ivory Coast had found a deficiency in post-exposure rabies risk management by complaining that 56% of the victims who had consulted at the rabies center had received no local treatment, and that nearly all of them had not benefited from any prophylaxis post exposure to rabies risk [8]. He suggested improving the affordability of the vaccine associated with the development of laws requiring animal owners to take PEP to improve PEP in case of exposure [8,9]. The results of our study illustrate this lack of interest of health workers who have never received continuous training in rabies, regardless of their length in service and their professional categories. Madhusudana et al in India also found that PEP was often neglected by medical staff [10].

Conclusion

Anti-rabies prophylaxis is an essential strategy for rabies control, alongside vaccination of animals. Our study took place in the city of Ouagadougou where animal bites, in this case those of the dog are very frequent. It found that the first-level health staff had knowledge and practices that were inconsistent with WHO's recommendations for anti-rabies prophylaxis. Since declared rabies is a life-threatening

disease, post-exposure prophylaxis is always a medical emergency. Also, first level health care workers must be trained accordingly to deal with the different risks of exposure to rabies. Taking into account the shortcomings noted should enable the development of an action plan aimed at improving the management of rabies risk exposure cases.

References

1. Dacheux L, Bourhy H (2011) Le diagnostic de la rage. *Rev Franco Lab* 430: 33-40.
2. Laetitia C (2010) Les zoonoses en France Evaluation des connaissances des médecins et vétérinaires. Thèse Vet Université Paul-Sabatier Toulouse, 4061: 185.
3. Ribadeau-Dumas F, Dacheux L, Bourhy H (2013) La rage. *Médecine Sci* 29: 47-55.
4. Organisation Mondiale de la Santé (2007) Relevé épidémiologique hebdomadaire, 82: 425-36.
5. Haut conseil de santé publique (2013) Vaccinations contre la rage et prophylaxie post-exposition Recommandations. Avis et rapports, 29: 1161-66.
6. Dodet B, Adjogoua EV, Aguemon AR, Baba BA, Bara Adda S, et al. (2010) Lutte contre la rage en Afrique : du constat à l' action. *Bull Soc Pathol Exot* 103: 51-59.
7. Khawplod P, Wilde H, Benjavongkulchai M (2007) Immunogenicity study of abbreviated rabies pre exposure vaccination schedules Vaccination. *J Travel Med* 14: 173-76.
8. Tiembré I, Dagnan I, Douba A, Adjogoua EV, Bourhy H, et al. (2010) Surveillance épidémiologique de la rage humaine dans un contexte d'endémie de rage canine en Côte d'Ivoire. *Med Mal Infect* 40: 398-403.
9. Tiembre I, Benie J, Attoh-Touré H, Zengbe-Acray P, Tetchi SM, et al. (2013) Abandons de prophylaxie post-exposition au Centre antirabique d'Abidjan, Côte d'Ivoire. *Bull Soc Pathol Exot* 106: 272-77.
10. Madhusudana SN, Sukumaran SM (2008) Antemortem diagnosis and prevention of human rabies. *Ann Indian Acad Neurol* 11: 3-12.

