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Research Article

Epidemiology of Rift Valley Fever (RVF) in the Sub-prefecture of Ngaoundaye in the Central African Republic in 2025

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Abstract

Rift Valley fever (RVF) is one of the five priority zoonotic diseases in the Central African Republic monitored by human, animal, and environmental health services, but epidemiological data on this disease is currently limited or even non-existent in the country. This study was therefore conducted in the country to assess the prevalence of the disease in ruminants (cattle, goats, and sheep) in the sub-prefecture of Ngaoundaye, a town located in the prefecture of Lim-pendé, which borders the Republic of Cameroon (2 km) and Chad (10 km). To this end, 239 serum samples were collected from cattle (n = 28), sheep (n = 46), and goats (n = 165). An analysis was carried out at the central veterinary laboratory in Bangui using a competitive ELISA test to detect the presence of antibodies against the FVR virus. The results obtained from the laboratory indicated an overall prevalence of 0.83%. By species, the prevalence was 7.14% in cattle, while all samples from sheep and goats were negative for Rift Valley fever. These data show that Rift Valley fever virus is circulating silently among ruminants in the Ngaoundaye region and call for urgent measures for active surveillance of Rift Valley fever in animals by the country's veterinary services.

Keywords

Rift Valley Fever, Ruminants, Prevalence, Central African Republic

1. Introduction

Rift Valley Fever (RVF) is one of the five priority zoonoses under surveillance in the Central African Republic. It is caused by a phlebovirus, transmitted mainly by Aedes and Culex mosquitoes, but also by direct contact with infected animals or their body fluids. It affects domestic animals, particularly cattle, sheep and goats, as well as wildlife and humans [2, 10-15]. In animals, the main symptoms are abortions in females and high mortality in young animals (Gerdes, 2004). The economic impact is therefore considerable, with massive losses in flocks, particularly in young sheep and goats, where mortality can reach 90 [5]. These losses disrupt livestock farmers' livelihoods, food security and local econ-

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omies [11-13].

Since it was first isolated in Kenya in 1931, the RVF virus has gradually spread throughout Africa and the Middle East, where it has caused numerous epizootics. Epizootics are generally triggered by intense rainfall and the resulting outbreaks of mosquitoes. In West Africa, the first known outbreak took place in Mauritania in 1987, when 250 human cases, including 28 fatalities, were recorded, following an epizootic in small ruminants; then a second emergence, ten years later, again in Mauritania, caused epizootics and human contamination [4, 7].

In the Central African Republic (CAR), RVF is endemic. From 2019 to 2024, 04 cases were noted in Boali (Ombella M'Poko), Chimbolo (Ouaka) and Safa (Lobaye).

A new outbreak of Rift Valley Fever (RVF) was declared in Ngaoundaye, in the Lim-Pende prefecture. Between December 23, 2024 and January 8, 2025, five human cases were confirmed by the Institut Pasteur in Bangui, including one death. On January 10, 2025, the Ministry of Health and Population declared the epidemic, drawing attention to its seriousness for public health and its economic impact, particularly for livestock farmers. Ngaoundaye is particularly exposed to RVF due to its geographical position (2 km from Chad and 10 km from Cameroon). There is also a high level of cross-border mobility of livestock, people and wildlife in the area.

Recurrent outbreaks of RVF highlight the structural shortcomings of the CAR's animal health system, notably inadequate infrastructure, impassable roads, shortage of qualified personnel, lack of financial resources and, above all, the lack of a functional nationwide animal disease epidemio-surveillance network. The current epidemic in Ngaoundaye is a good illustration of this vulnerability. Ngaoundaye's proximity to neighboring countries and areas accentuates the risk of cross-border spread, making regional coordination essential. Climate change, particularly heavy rainfall, will exacerbate the risk of future epidemics.

In response to the RVF epidemic, a mission consisting of a central and decentralized multi-sectoral team supported by the FAO was carried out in the sub-prefecture of Ngaoundaye to conduct in-depth investigations in ruminants and humans. The aim of this study was to analyze the circulation of the rift valley fever virus in ruminants in the Ngaoundaye sub-prefecture.

2. Materiel Et Methodes

2.1. Study Area

The study was carried out in the town of Ngaoundaye and surrounding villages. The study area is located in north-western CAR (2 km from Chad and 10 km from Cameroon). The town of Ngaoundaye has reported one confirmed case of RVF in humans. The study area has a Sahelian climate, with a rainy season from March to June and from October to mid-December. Livestock production is characterized by a predominance of extensive farming systems, with significant herd movements. The area is also a host to transhumance animals from Cameroon and Chad.

2.2. Translated with Echantillon

Sera samples for the present study were collected during the rapid investigation and response mission to cases of Rift Valley Fever in CAR. A total of 239 animals sera were collected and recorded in the table below.

Table 1. *number of samples taken.*

Species	Females collected	Mâles collected	Total number of samples collected
Bovine	10	18	28
Goat	139	26	165
sheep	35	11	46
Total	184	55	239

2.3. Serological Tests

Ovine, caprine and bovine sera were tested using the competition ELISA method. The ID-VetScreen Rift Valley Fever Competition Multi-Species ELISA kit was used at the central veterinary laboratory in Bangui.

2.4. Analyse Statistique

Overall prevalence was estimated by dividing the number of positive sera by the number of sera tested. Species-specific prevalence was estimated by dividing the number of positives (n) by the group size (N). All data were entered into Microsoft Office Excel 2013.

3. Results

3.1. RVF Prevalence

The results of this study were obtained from the sera of three domestic animal species (bovine, caprine and ovine). Thus, out of 239 sera, 28 came from cattle and 211 from small ruminants, including 46 from sheep and 165 from goats.

Of all the sera tested, two were positive for RVF, giving an overall prevalence of 0.83%. By species, the two positive samples were found in cattle (females), for a seroprevalence of 7.14%. No positive samples were found in sheep or goats.

Table 2. RVF prevalence by species in CAR in 2025.

Species	Number of sera tested	No. of positive sera	Prevalence (%)
Bovine	28	2	7,14
Goat	165	0	0
sheep	46	0	0

3.2. Risk Factors

The risk factors for rift valley fever recorded in this study were:

1. Environmental conditions

Recent heavy rainfall in the town of Ngaoundaye favors the proliferation of mosquito vectors, hence a major risk factor. Existence of waterholes throughout the zone.

2. Lack of vaccination

The absence of Rift Valley Fever vaccination programs in the country increases the risk of outbreaks in animals. To date, no vaccination campaign has been carried out, despite the existence of a vaccine against this disease.

3. Transhumance

The town of Ngaoundaye is a transit area for transhumant herders, as it borders Cameroon and Chad. Transhumance favors the circulation of the virus and contamination of animals.

4. Consumption of Diseased Animal Products

The local population consumes milk, dairy products, meat or blood from animals regularly in the town, which was a major risk factor for exposure to Rift Valley Fever.

4. Discussion

The overall prevalence obtained (0.83%) is well below that reported by ADAMOU [6], which was 20.18%, and that of AKAKPO [1], which concerned only small ruminants (2.8%) in Niger. In addition, a prevalence of 5.53% was reported by Thiongane [14] in Niger. This difference can be explained by the fact that these studies were carried out in a context where there was no clinical case of RVF, the aim being to verify the presence and circulation or otherwise of the virus within the animal population in the town following the declaration made by the Ministry of Health and Population. In the present study, the outbreak occurred in an area bordering two countries (Cameroon and Chad), where there is no further movement of animals during cross-border transhumance. The difference in seroprevalence between large ruminants (7.14% in cattle) and small ruminants (0% in goats and 0% in sheep) has been reported in other studies [9, 8]. The high prevalence in cattle can be explained by the fact that the bovine breed (adults over 5 years old) is sometimes subject to transhumance in search of pastures and watering holes, where they could be contaminated by mosquito bites, especially as we are in a pastoral zone par excellence. The virus can be transmitted to humans mainly through direct contact with infected animals (sheep, cattle, goats, camels), consumption of raw milk, handling of animal tissue during slaughtering or butchering, assistance with animal births, veterinary procedures or disposal of carcasses or fetuses [3]. Certain occupational groups such as breeders, farmers, slaughterhouse workers and veterinarians are therefore at greater risk of infection through the handling of meat and body fluids, and the consumption of raw milk [2]. It can also be transmitted to animals through the bites of infected mosquitoes, at livestock markets and during transhumance.

5. Conclusion

The present study shows a higher prevalence of RVF in cattle (7.14%). The results of this study confirm the existence and circulation of the virus within the country, particularly in border and pastoral areas. This is why further work needs to be undertaken, in order to carry out an entomological study. In addition, a control plan based on the “One Heath” approach is needed to anticipate the rapid management of any new epizootic outbreak, and to revitalize the epidemiological surveillance network.

Abbreviations

RVF Rift Valley Fever

Authors' Contributions

All authors contributed to this work. KOLEGA participated in data collection, serological analysis and statistical analysis. NDONIDE drafted (or prepared) the manuscript and made corrections after submission to the Journal. DAHOUROU contributed to the reading and correction of the article. KOLEGA and NDONIDE performed and supervised the serological analyses of the results. DAHOUROU supervised the activities of this work, contributed to the elaboration of the protocol and the correction of the manuscript.

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Data collection for this study was carried out with the financial support of the food and agriculture organization of the united nations.

Data Availability Statement

The data for this study were collected in the field and are available in the study area and accessible through.

Conflict of Interest

The authors declare no conflicts of interest.

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