Lassa Fever and Communicable Disease Surveillance and Control in Sierra Leone

Report and Recommendations of WHO/UNHCR mission to Sierra Leone

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1. Overview

Lassa fever is a viral haemorrhagic fever due to an Arenavirus, endemic in several tropical West African countries including Sierra Leone, Liberia, Guinea and Nigeria. It periodically reaches epidemic proportions, the last outbreak occurring in Sierra Leone in 1996. The reservoir of Lassa virus is the rodent, species Mastomys. Transmission occurs through direct contact of abraded skin and mucous membranes with rodent exceta deposited on surfaces such as floors or beds, or ingestion of food and water contaminated with rodent excreta, or via inhalation of aerosol containing virus particles. Person to person transmission occurs when a person is exposed to blood, tissue, secretions or exceta of an infected individual. Nosocomial spread in health facilities and laboratories through contact with secretions or blood or through contaminated equipment.

Lassa fever has been endemic in eastern Sierra Leone since first diagnosed in 1971 as part of an epidemic originating in Panguma. The area of endemicity is defined by a triangle between Kailahun, Tongo and Kenema, also known as the Lassa belt. In October, 2002, 3 suspected cases were reported in a refugee camp in Bo district in southern Sierra Leone, outside the known Lassa belt.

During the period from 1st January 2003 to 30th April 134 cases of Lassa Fever were reported in 3 camps holding Liberian refugees in Sierra Leone, Jimmi Bagbo, Gerihun and Largo camps, including 11 deaths. Diagnosis for all cases was on the basis of clinical suspicion. Two of these camps, Jimmi Bagbo and Gerihun are located in Bo district, a region previously thought to be outside of the endemic area of Lassa fever infection. These cases seem to indicate that Lassa fever has spread west in Sierra Leone. See figures 1-3 below for trend in number of suspected Lassa cases.

Fig 1: Number of suspected Lassa Fever cases referred to Kenema Government Hospital (KGH)1999 – June 2003:

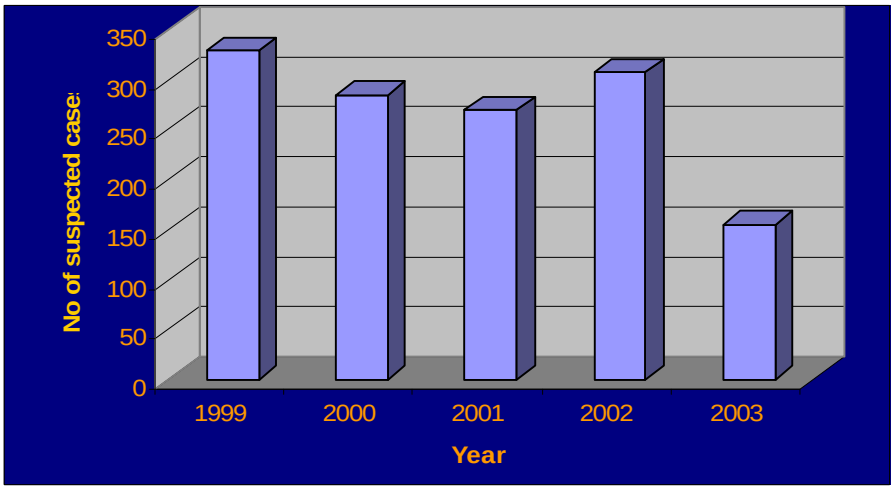


Fig 2: Number of suspected Lassa Fever cases referred to KGH Jan-Jun 2003 by community and refugee camp.

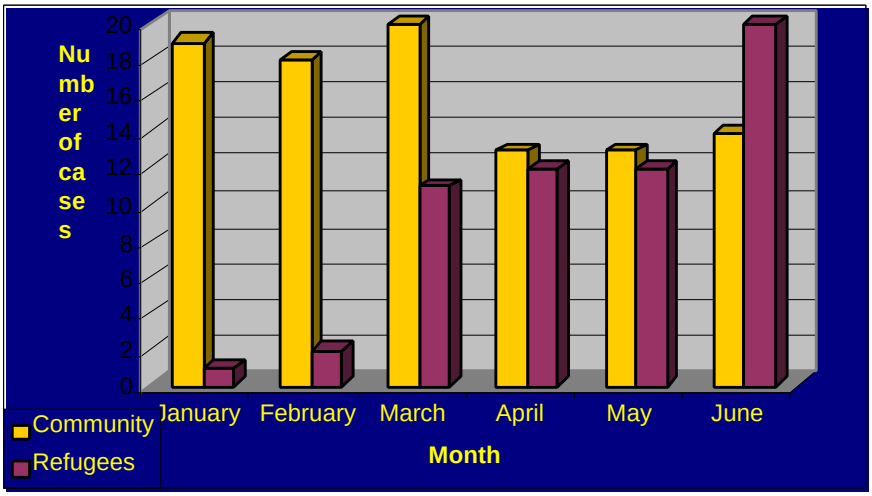
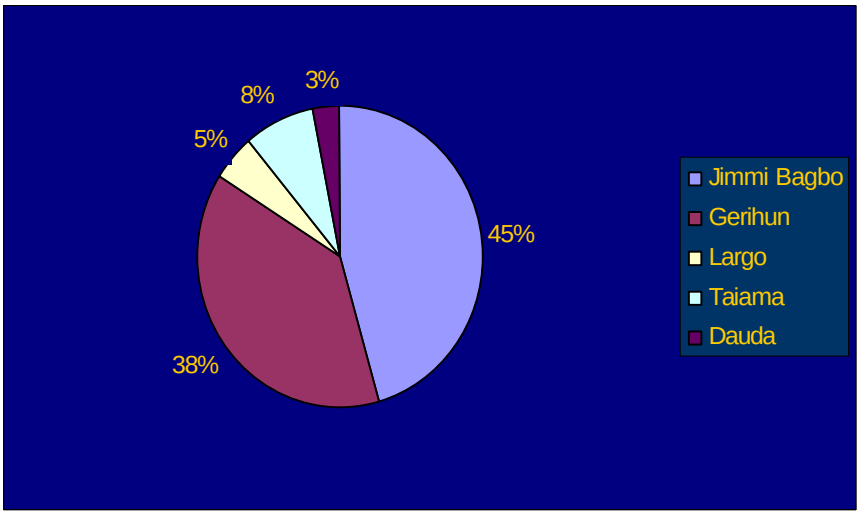


Fig 3: Proportion of suspected Lassa Fever cases by camp, Jan-Jun 2003:



Hypotheses to explain the potential spread of Lassa fever infection

- Environmental changes during the last 10 years have changed the distribution of Lassa virus infected *Mastomys natelensis*, the natural host of Lassa virus, within Sierra Leone.
- Migration and displacement of populations of infected individuals from the previously endemic region has resulted in cases of Lassa fever in new areas.

2. Objectives of mission

- To assess the overall system of communicable disease surveillance and control as a means to improving control of Lassa Fever in Sierra Leone.
- To review the clinical management of suspected Lassa patients
- To conduct a training on Lassa Fever surveillance, clinical management and infection control, laboratory diagnosis and methods of obtaining seroprevalence data.
- To obtain preliminary sero-prevalence data and compare this with historical data mapping the regions and prevalence of Lassa infection.
- To obtain samples to evaluate the possible use of saliva as a sample for Lassa serological diagnosis
- To obtain an informed assessment of the applicability of methodologies to allow an ongoing serosurveillance program to be established.

4. Conclusions

SURVEILLANCE

Surveillance systems are operating in all health facilities visited with morbidity data generated on priority and other diseases on a monthly basis. A large proportion of health facilities is assisted by NGOs implementing a variety of surveillance systems with different reporting forms in addition to the MOHS reporting forms.

Written case definitions are only available in a few health facilities, however differences in definitions were seen within the same organization. Data was analysed by respective organizations at the field level and by the MOHS centrally, although there was little feedback on outbreaks or disease trends being sent back to peripheral health units.

Epidemic preparedness and response is incipient with an Early Warning System for epidemic disease being established in several sites. However, due to many years of war, and owing to the remoteness of many health structures, the poor state of roads and infrastructure, lack of communications, and lack of resources, information flow and therefore, response, is delayed. These factors not only undermine the Early Warning System, but also ultimately impact on overall communicable disease control.

The current surveillance system operating in Sierra Leone has a basic structure but is not standardized and requires more resources to perform effectively. The MOHS intends to perform a national assessment of the surveillance system and to implement an integrated disease surveillance system through consultation and collaboration with all partner agencies.

CLINICAL MANAGEMENT

- The knowledge and understanding of Lassa fever is highly variable amongst health facility staff.
- A universal Lassa fever specific case definition is not in place.
- The guidelines for fever management with respect to Lassa Fever are currently based on best practice.
- Access to the referral centre (Lassa Ward at Kenema Government Hospital supported by MERLIN) is location specific. Communities are unaware of referral mechanisms.
- The Lassa Ward at Kenema Government Hospital is the only referral centre for Lassa Fever in Sierra Leone.
- The Lassa Ward has only one clinician, Dr Conteh, capable of managing patients.

SEROPREVALENCE AND LABORATORY

To date, the main outcome of the mission have been that:

- Samples have been collected from several sites to undertake a seroprevalence for Lassa fever antibodies in the refugee camps and community. This will initiate ongoing sample collection by Sierra Leonian health authorities to establish ongoing sero-prevalence studies to map the regions and prevalence of Lassa infection.

- Local health officials and workers were fully involved in this initial study and should be positioned to continue this project in the future.,

Future, laboratory testing to support this project will need collaboration of a number of centers outside of this region. These would be centers equipped and experienced in the handling of Lassa fever virus, diagnostic testing and in generating the reagents that can be supplied for testing in other laboratories.

As an outcome of this mission, *an agreement was reached between the Viral Zoonosis Unit, Health Protection Agency, London and Laboratorie Centre.Hospitalier.Universitaire Donka Virologie, Conakry Guninea* to support the development of diagnostics for Lassa.

It is intended that this working relationship between an established Lassa Fever laboratory in London and a regional reference centre in Conakry will be able to evaluate new diagnostic methodologies that be more appropriate in lower technology laboratories

This is particularly pertinent since the assessment of laboratory facilities currently available in Sierra Leone provide no prospect of local implementation of current Lassa diagnostics in the immediate future.

From the laboratory perspective, further outcomes from this mission will result over the next two to three months as a full analysis of samples obtained is completed.

5. Recommendations

SURVEILLANCE

1. WHO should provide technical support to the Ministry of Health and Sanitation (MOHS) and partners to ensure a systematic and strengthened approach to communicable disease surveillance and control.

    - Standard disease reporting forms should be implemented in all health care facilities in consultation with all health partners (WHO *Communicable Disease Toolkit for Sierra Leone* being developed - see attached sample surveillance forms and guidelines for Sierra Leone in annexes 7 & 8)
    - Standard case definitions for priority and epidemic-prone diseases must be distributed in an appropriate, usable format to health co-ordinators and all health facility staff.
    - Tiered analysis at district and central levels with appropriate feedback on outbreaks and disease trends.

2. WHO should provide technical support to the MOHS and partners in establishing epidemic preparedness and response mechanisms in communities and in refugee camps by assuring:

    - Outbreak preparedness plans for districts.
    - Minimum stockpiles (drugs, ORS, IV fluids).
    - An early warning system incorporated as part of the surveillance system (*WHO Communicable Disease Toolkit for Sierra Leone*)
    - Outbreak investigation kits (sampling, transport) available at the district level
    - Guidelines to laboratory specimen sampling (WHO *Communicable Disease Toolkit for Sierra Leone*)
    - Appropriate and timely control measures to be implemented in event of an outbreak.
    - Development of guidelines on case management of epidemic-prone diseases and distribution to all health facilities (*WHO Communicable Disease Toolkit for Sierra Leone*)

3. A review of logistic support to the surveillance and epidemic preparedness and response system (communications – particularly radios, transport, computer facilities) needs to be undertaken.

CLINICAL

4. Standard clinical guidelines and treatment protocols must be available to all health co-ordinators and clinical workers in all health facilities. Updated national MOH or WHO guidelines should be used where available.

5. Clinical services must be strengthened with particular view to providing additional clinical staffing support for Dr Conteh at Kenema Government Hospital, for example an additional medical doctor, nurses and laboratory assistant.

6. Enhance infection control procedures in health facilities with ongoing training and provision of appropriate protection materials such as masks, gloves, gowns, eye-shields, boots, and disinfection and cleaning materials.

7. Improve awareness of referral mechanisms by health care workers, for example the 24 hour Lassa ambulance service available for camp and community referrals to the Kenema Government Hospital Lassa Ward.

LABORATORY

8. Enhance local diagnostic support for the clinical Lassa reference facilities in Kenema government hospital

9. New laboratory for sample processing in Kenema (to reflect the pathogenic nature of Lassa fever virus)

10. Improve general diagnostic facilities to support the differential diagnostic options at Kenema Government Hospital

11. Clinical staff to continue sampling suspected Lassa fever cases to refine clinical diagnostic algorithms and tools

SEROPREVALENCE

12. Continued sampling to undersand seroprevalence using revised protocols based on preliminary sampling results

13. Sampling should be proceeded by a significant period of sensitisation of the population

ENVIRONMENT

14. Ensure proper storage of food and water particularly in refugee camps, e.g. distribution of rat-proof storage containers with sealed lids to families, rat-proof containers in warehouses that store food prior to distribution.

15. Continue efforts on rodent control – adequate site planning, sanitation facilities, safe refuse disposal and environmental sanitation, development of local traps for rat catching.

IEC

16. Continue sensitisation on Lassa Fever with increased focus on village communities, particularly with regards to:

- preventative measures (safe food and water storage, avoid rat-eating practices, appropriate sanitation and waste disposal, environmental sanitation to decrease rat population, personal hygiene and hand-washing)
- importance of seeking treatment early if fever
- referral mechanisms

6. Acknowledgements

Many thanks go to UNHCR who jointly funded this mission with WHO.

We gratefully acknowledge the field support provided by WHO, the MOHS, UNHCR and Merlin.

We would also like to thank the Paramount, Section and Town Chiefs of communities visited, the Management of all refugee camps and way stations, and the staff of health facilities visited and their supporting NGOs (MSFF, MSFB, Merlin, IMC, IRC), and in particular, the staff at Kenema Government Hospital Lassa Ward.