MONKEYPOX
Central African Republic

Epidemiology, surveillance and laboratory capacities: what else is needed?

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Monkeypox in the CAR 2001-2021

April 30th 2012
2 cases one bited by Squirrel
Sample: 1/2 (+)

March 2017
1 case, a 40-year-old pygmy
Sample: 1/1 (+)
After investigation:
23/26 (+ IgG)

1984
6 cases Clinically

4 June 2010
2 young pygmy Rodent killing and consumption
Sample: 2/2 (+)

Juillet 2018
6 cases, Sample: 3/12(+)

August 14th 2001
8 members same family Consumption of death monkey 2 deaths
Sample: 5/5 (+)

January 6th 2018
6 cases including 4 members of the same family
Sample: 6/8 (+)

January 30th 2015
3 members same family 1 death (8 years)

Dece 2015 & Sept 2016
22 people/5 deaths
Sample: 7/7 (+)

April 13th, 20th 2018
7 cases, 2 from same family
Sample: 3/12(+)

January 2017
6 people from same family 5 without symptoms
Sample: 1/6 (+)

April 30th 2012
2 cases one bited by Squirrel
Sample: 1/2 (+)

August 14th 2001
8 members same family Consumption of death monkey 2 deaths
Sample: 5/5 (+)
Monkeypox: the national surveillance
Monkeypox: Outbreak investigation

Pattern of monkeypox virus transmission hypothesized to have occurred during these outbreaks.
Monkeypox outbreaks in the CAR 2001-2021

Outbreak size:
from 1 to 13 confirmed cases
25 suspected and confirmed cases maximum

Monkeypox national surveillance database
2001 – 2021

95 suspected outbreaks
32 chickenpox outbreaks
n=59 participants
chickenpox confirmed cases: 48
suspected cases: 8
contacts: 3

23 monkeypox suspected outbreaks
n=82 participants
suspected cases: 40
contacts: 42

40 monkeypox outbreaks
n= 327 participants

Monkeypox confirmed cases: 99
Two co-infection chickenpox-monkeypox

Monkeypox suspected cases: 61

Contacts of monkeypox cases: 167

Median = 1 - Range: 1 to 13 by outbreak

Median = 0 - Range: 0 to 15 by outbreak

Median = 0 - Range: 0 to 32 by outbreak
Zoonotic or inter-human transmission?

**Zoonotic transmission**
16/40 outbreaks with suspected zoonotic sources without animal reservoir determination

Probable underestimation of wildlife/human contacts

**Interhuman transmission**
65.7% described a contact with a human cases
95.2% of interhuman contacts are intra-household
Mean age : 15.5 years
Female : 53.1 %
Clinical characteristics

**Incubation= 7 days** (IQR : 1-13, range : 0 - 17)

**Genital lesions : 91,3%** (n=42/46 with available information)

*Figure 4: Frequency of signs and symptoms in people with confirmed monkeypox virus infection in the CAR, 2001-2021 (n=99)*
Disease outcomes and Case Fatality Ratio

Case Fatality Ratio : 7,5 % (12/160)
Children Case Fatality Ratio : 9,6 % (8/83)

Role of co-infection with HIV?
With chickenpox?

8 co infection with malaria

-One or several complications (n=11 patients)
Broncho pneumonia (4)
Septicemia (3)
Deshydratation (6)
Superimposed bacterial cutaneous infection (1)
Fistulization of an adenopathy (1)
Corneal ulceration (1)
Cutaneous sequelae (4)
### Monkeypox diagnostic tools

<table>
<thead>
<tr>
<th>Diagnostic method</th>
<th>Reagents and equipment</th>
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<tr>
<td>Real Time PCR</td>
<td>- qPCR generic primers</td>
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<tr>
<td>Monkeypox typing and sub-typing primers</td>
<td>- qPCR Congo Basin strains primers</td>
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<td>- qPCR West African strains primers</td>
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<td>- qPCR cowpox strain</td>
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<td>- Equipment: ABI 7500 Fast</td>
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<tr>
<td>Virus isolation</td>
<td>- Intracerebral inoculation (very sensitive)</td>
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<td>New born mice inoculation</td>
<td>- Equipment: BSL-3+ lab with a BSC level-III</td>
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<td>ELISA</td>
<td>- IgM and IgG detection (but high cross-reactivity, false positives and false negatives)</td>
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<td>- Equipment: ELISA chain</td>
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<td>- No multiplexing capability</td>
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Viral Isolation

• Preparation of crushed crusts, serum dilution, pus

• Intracerebral inoculation of the suspension to a litter of 9 newborn mice

• Mice visited every day and mortality noted (death between 2 and 4 days)

• Presence of verified on at least one mouse by qPCR
Increase of the monkeypox outbreaks since 2018

- Improved detection and response to disease?
- Population movements due to civil and military unrest or migration?
- Environmental and ecological disturbance?
- Animal dynamics?
What else is needed?

- Improvement of local health system capacity and training

- Health care worker protection: delivery of vaccine and Personal Protective Equipment (PPE)

- Protection of local communities: Infection Prevention and Control, medical waste management

- Evaluation of the general population exposition

- Need for transboundary collaboration in the sub region around the understanding of the Congo Basin strain: ecological understanding of the disease

- Improvement of wildlife health surveillance
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