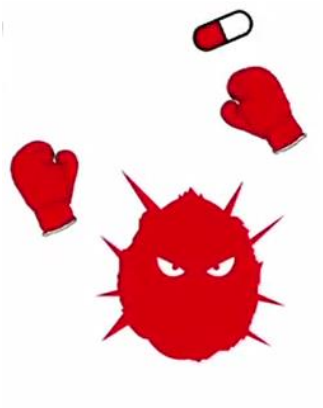
Outbreak of multi-resistant *ESBL Klebsiella pneumoniae* in a neonatology unit, Bangui, Central African Republic March-June 2017



Dr Julita Gil
On behalf of the Klebsiella team

MEDECINS SANS FRONTIERES | LuxOR Luxembourg Operational Research

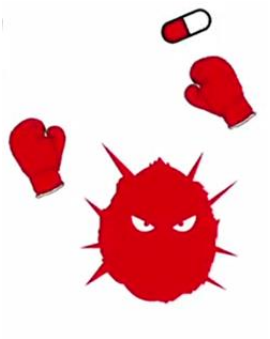
MSF-OCB maternity in Bangui, CAR

- OCB supported maternity since 2014
- Most visited maternity in the capital
- Comprehensive Emergency Obstetric and

Neonatal Care

- 141 newborn admissions per month

ESBL Klebsiella outbreaks



- Extended-spectrum beta lactamase (ESBL)
  - Multi-resistant to antibiotics
- Leading cause for outbreaks in neonatal units
  - Average duration 6 months - 15 months in MSF Haiti
- Mortality: 31% - 76% in MSF Haiti
- Factors predisposing: suboptimal hygiene standards
  - Understaffing and overcrowding

Outbreak alert and study objective

- On 9 March 2017, 2 neonatal sepsis cases of ESBL *Klebsiella pneumoniae*
  - No haemoculture results in the previous year
  - Number of sepsis above the expected (as per the neonatal database)

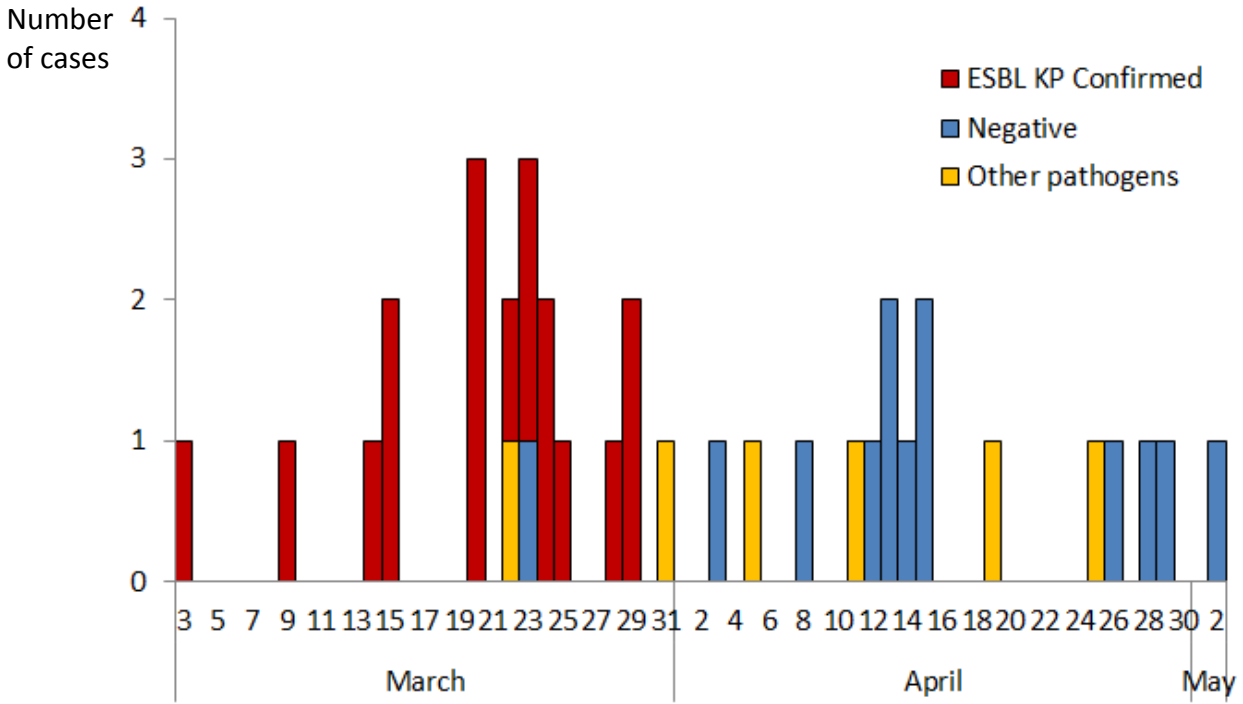
- To describe the outbreak, the risk factors and to provide operational recommendations to avoid future outbreaks

Case definition of ESBL *Klebsiella pneumoniae* (KP)

- **Suspected case**: a newborn admitted in the neonatal unit with sepsis signs and symptoms from 9 March 2017
  - Haemocultures requested from each suspected case

- **Confirmed case**: ESBL *KP* isolated in haemoculture by Institut Pasteur, Bangui

Distribution of suspected ESBL KP cases by date of hemoculture

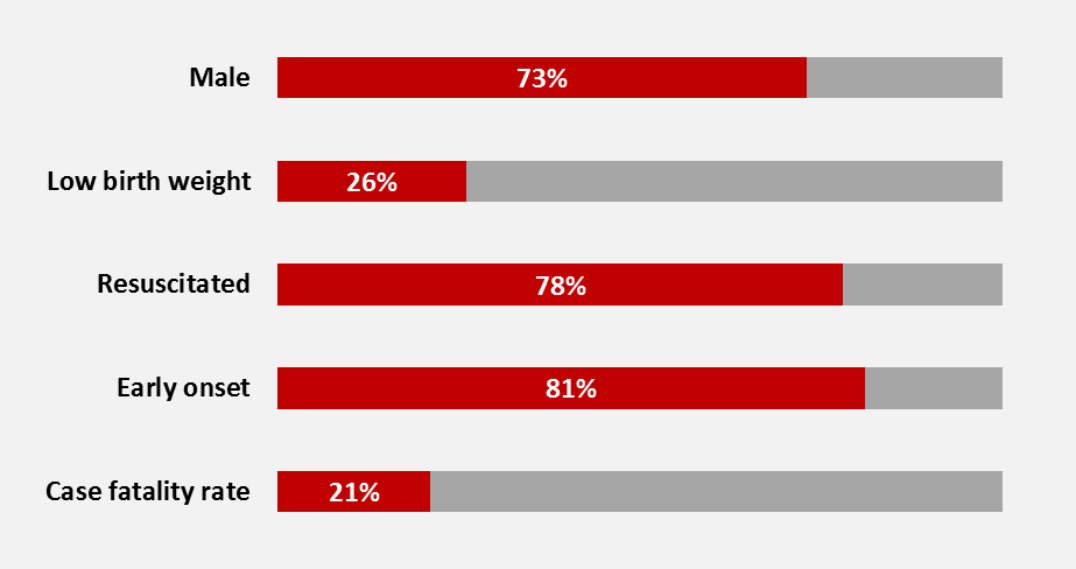


Pathogens isolated:

Klebsiella ornitiolytica
Klebsiella oxitoca
Staphylococcus xylosus
Enterobacter aerogenes
Pseudomonas aeruginosa
Pseudomonas cepacia

Characteristics

19 confirmed ESBL *Klebsiella pneumoniae,* 2-29 March



- Mean hospitalization: 16 days (0-26)

Antibiograms of ESBL KP

- 100% resistant to Ampicilline
- 100% resistant to Gentamicine

- 100% resistant or intermediate to Cefotaxime /Ceftriaxone
- 47% resistant to Chloramphenicol
- 100% sensitive to Imipenem and Amikacin

Clinical management – antimicrobial therapy

Prophylaxis	Ampicilline + Gentamicine			
1st line	Ampicilline + Gentamicine			
2nd line	Ampicilline + Cefotaxime*	Chloramphenicol + Amoxi-Clav ***(mid March)****	Amikacine + Imipenem/Meropenem ***(end March)***	Ampicilline + Cefotaxime* ***(third week May)***
3rd line	None			

*MSF neonatology guidelines
** No availability of Imipenem

Risk factors for ESBL KP cases

Risk factor	Adjusted Odds Ratio		
	OR	95% CI	p - value
Male	1.8	0.5-6.9	0.337
Low birth weight	3.3	0.9-11.4	0.052
Prematurity	4.3	0.8-23	0.084
Resuscitated *	4.9	1.2-19.5	0.022
Mother's Infectious risk	1.1	0.3-3.9	0.852

Logistic regression used to compare ESBL KP neonates (n=19) with rest of admitted neonates (n=141) over this period

* Resuscitation immediately after birth included use of Ambu and/or Oxygen cannula

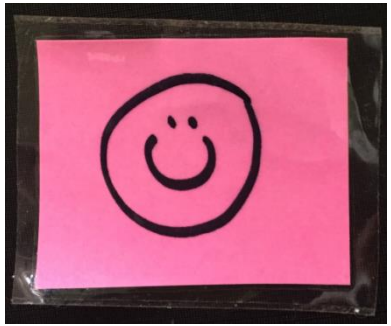
Infection prevention and control (IPC)

Standard precautions

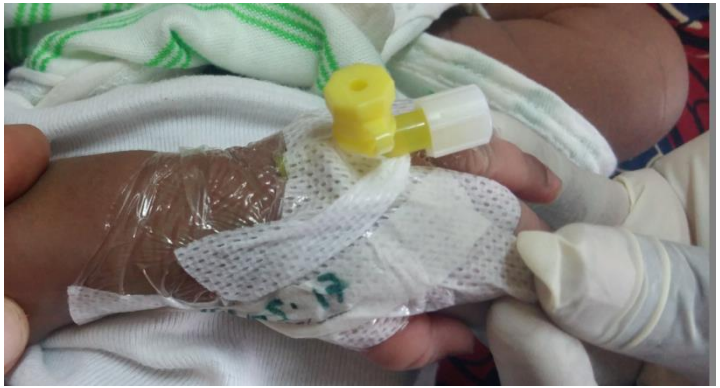
- Hand hygiene
- Cleaning and disinfection of the environment
- Reprocessing of reusable medical equipment
  - Ambu, Oxygen concentrator, suction device

Infection prevention and control (IPC)

- “Isolation”/ reorganization of care



- Infection prevention in the care
  - IV access
  - Nursing care procedures



Challenges

- Reinforce the IPC standards and sustain them
- Nosocomial outbreak response
  - Laboratory capacity for haemocultures
  - Communication

Conclusions

- Nosocomial transmission of ESBL Klebsiella
  - Vigilant paediatrician needed to alert and manage
  - Association with resuscitation and inadequate IPC

- Peak of the outbreak controlled due to multidisciplinary response
  1. IPC
  2. systematic haemocultures
  3. access to antibiotics

- Detection of other pathogens: complexity to respond

Operational questions

- To what extent **nosocomial outbreaks** and **antimicrobial resistance** affect MSF maternal and neonatal units?

- Are we ready to tackle it?

1. **IPC**
2. Microbiology in the field
3. Antibiotic stewardship

“We only see what we look at”

John Berger

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