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Carriage of extended-spectrum beta-lactamases and carbapenem-resistant Gram-negative bacilli in children under five suffering from complicated severe acute malnutrition hospitalised in a district hospital in Niger.

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Background:

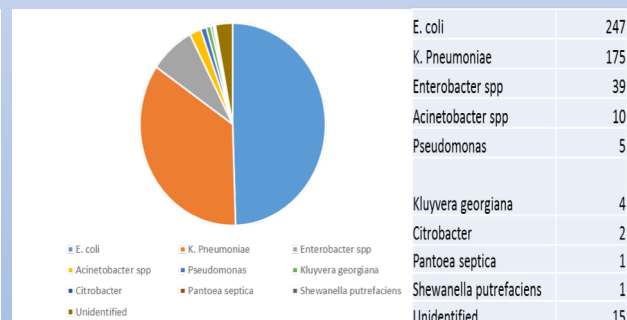
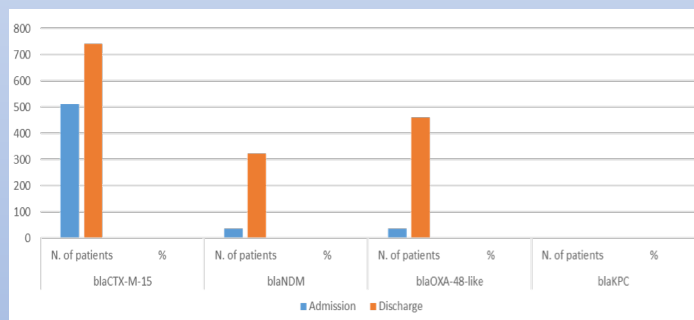
Carriage of multi-drug resistance bacteria is of major concern as they have spread worldwide and are frequently associated with nosocomial infections. This sub-study is part of a larger study on nosocomial bacteraemia among hospitalized children with severe acute malnutrition (SAM) and evaluation of infection and prevention control (IPC) practices. We aimed to assess the spread of extended-spectrum β -lactamases (ESBLs) and carbapenem resistance (CR) gram-negative bacilli in children's rectal flora during hospitalisation.

Materials/methods:

Between September 2016 and December 2017, 2738 rectal swabs were collected from 1369 children (aged 6- 59 months) suffering from complicated SAM and hospitalized in therapeutic Sans Frontières in Maradi region, Niger. The swabs were collected on both patient's admission and discharge. Swabs were collected on Cary Blair + charcoal, then store at room temperature until shipment. They were plated on chromogenic agar plates (Liofilchem, Italy) supplemented with vancomycin+ertapenem (10mg/L+1mg/L) and vancomycin+cefotaxime (10mg/L+1mg/L). We screened the presence of resistance genes by multiplex (*bla*NDM, *bla*KPC *bla*OXA48-like) and simplex (*bla*CTX-M-15) PCR. PCR samples positive for resistance genes were isolated and the species were identified by MALDI-TOF. The study has been approved by the National Consultative Ethics Committee from the Ministry of Public Health in Niger.

Results:

Among 1369 patients, 2.6%(n=36) carried *bla*NDM, 2.7% (n=37) carried *bla*OXA-48-like and 37% (n=510) of patients were PCR-positive for *bla*CTX-M-15 upon admission. No *bla*KPC was detected in any patient. At discharge, the percentage of patients PCR positive for the resistance genes was 23.5% (n=322), 33.5% (n=459) and 54% (n=741) for *bla*NDM, *bla*OXA-48-like and *bla*CTX-M-15, respectively. Further analysis will be done to estimate the acquisition rate and relatedness between the strains. MALDI-TOF results on 317 PCR positive isolates for resistance identified six species, the most prevalent ones were namely, *E. coli* (n=174), *Klebsiella pneumoniae* (n=95) and *Enterobacter* (n=31).



	<i>bla</i> CTX-M-15		<i>bla</i> NDM		<i>bla</i> OXA-48-like		<i>bla</i> KPC	
	N. of patients	%	N. of patients	%	N. of patients	%	N. of patients	%
Admission	510	37,00%	36	2.6%	37	2.7%	0	0%
Discharge	741	54%	322	23.5%	459	33.5%	0	0%

Conclusions:

The increase of ESBL and CR carriage, during the hospital stay is of concern, especially in this vulnerable population of SAM children. Reinforcement of infection prevention and control measures will allow to control the spread of multi-drug resistant bacteria in the health care facility.