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INTRODUCTION

Nosocomial infections, particularly ESBL-producing Enterobacteriaceae (ESBL-PE) and carbapenem resistant Enterobacteriaceae infections, cause lengthening of hospitalisation's duration and increase mortality. Literature reported the impact of environmental dissemination of resistant Enterobacterales during epidemics. Few studies described the environmental dissemination of multidrug resistant bacteria from hospitalised patients compared to their cultivable gut microbiota.

AIM

Study association of resistant Enterobacterales carriage and hospital patient's environment contamination.

METHOD

Study : Prospective study, between february to october 2020

Samples : Fresh stool samples were prospectively collected and compared with 5 high-touch surfaces in the direct environment :

- swab moistened with distilled water : footboard bar, call bell, inner handle,
- contact-agar : mobile table and char armrest

Valid stool samples : must be less than 24 hours old, and from a patient hospitalised in the laboratory's hospital for at least 24 hours

Microbiological analyses :

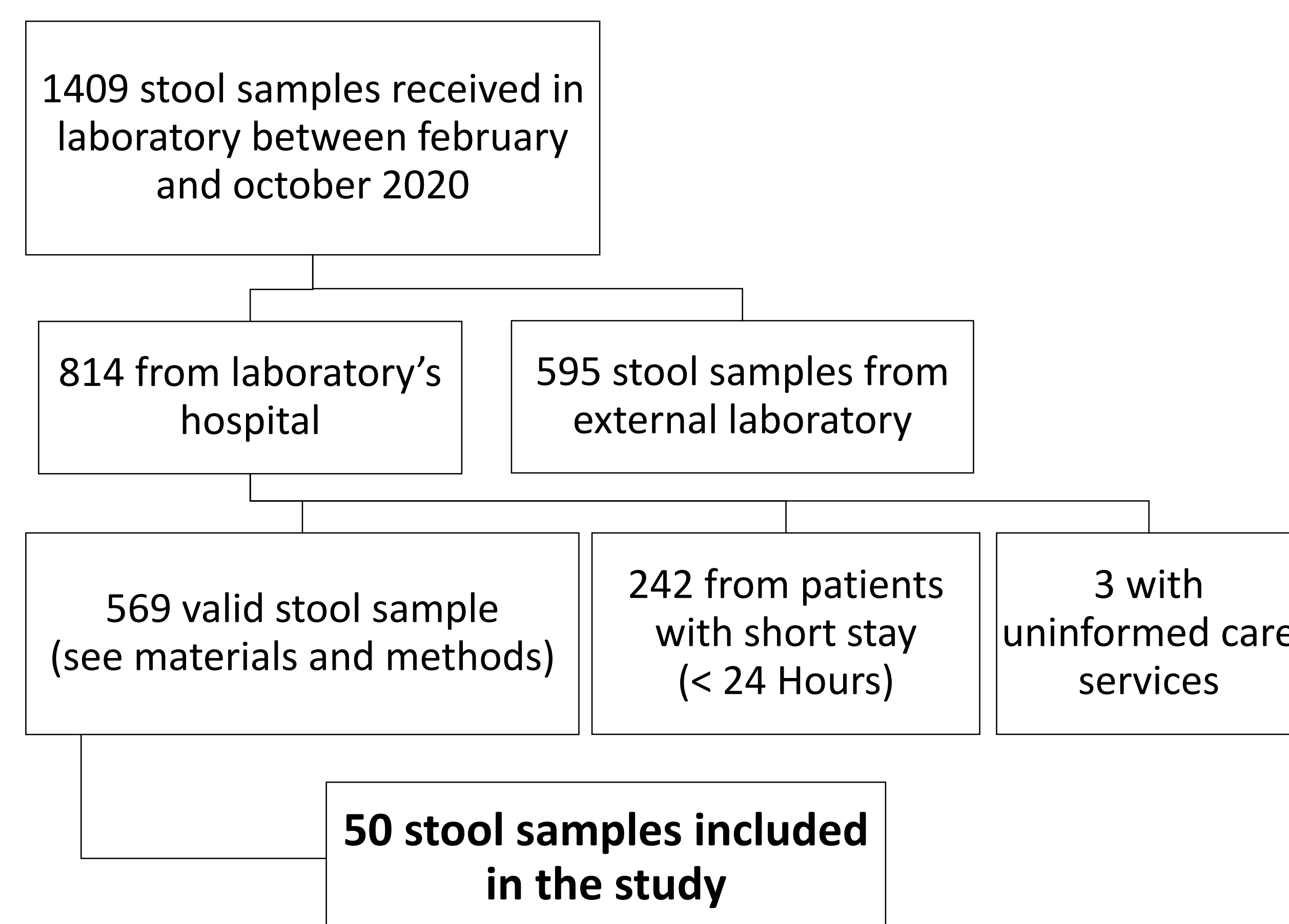
- Enterobacterales species and yeasts were searched and identified on all samples.
- Identification by MALDI-TOF®
- Antibiotic susceptibility testing, according to EUCAST/CASFM 2020 performed on Enterobacterales.

Clinical data :

- Population : age, sex
- Clinical data : length of stay, diarrhea, chronic wounds, faecal and urinary incontinence, permanent urinary catheter, antibiotics intake
- multidrug resistant bacteria carriage

RESULTS

Stool samples



Randomly selected stool samples (necessary selection due to the human resources dedicated to the study)

3 major services :
- Vascular medicine
- Internal medicine
- Hepato-gastro-entérology

Forty two patients (83%) were treated by antibiotics

Population

Population :

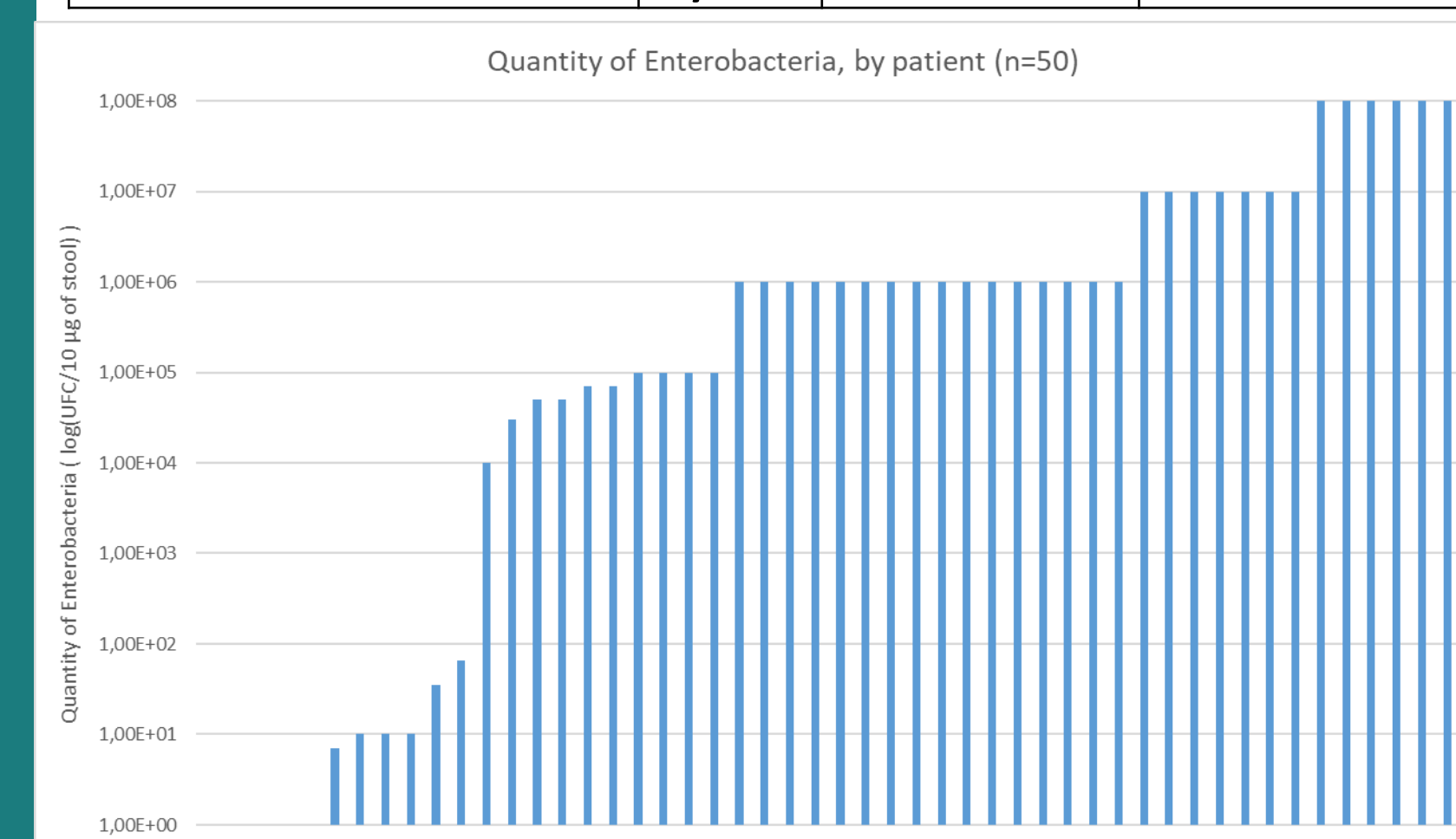
N = 50 patients
average age : 71 years old (min-max : 23-99)
42 patients (83%) treated with antibiotics

Median length of stay :
4 days (min-max : 1-35 days)

Sex ratio : 1,1 men / 1 women

Microbiological results

	Stool samples		Environmental sample	
		Presence of yeasts		
Presence of enterobacteria	no	1	4	Only 16 (11%) moistened swab reported bacteria, against 100 (100%) contact-agar.
	yes	16	29	



11 (22%) patients were found to have ESBL-PE, of which 5 were previously known.

Swab :
1 UFC of yeast

Contact-agar :
8 (16%) Enterobacterales resistant to 3rd generation cephalosporins and 1 (2%) yeast were found in culture.

Statistical associated risks factors

analysis : multiple linear regression

Mobile table

Overall flora

Identified risks factors are :
Men (reference: women) *
Permanent urinary catheter **
ESBL-carriage *

Identified protective factors are :
Rich digestive flora found *

Enterobacteria

Identified risks factors are :
Permanent urinary catheter *

Chair armrest

Overall flora

no statistically significant risk factors found

Enterobacteria

Identified protective factors are :
Rich digestive flora found **

P-value :

* : p < 0.05

** : p < 0.01

CONCLUSIONS

Outside of this study, the search of rectal ESBL-carriage is performed by swabbing. In this study, we use a resuspension of stool sample, more sensitive than swabbing. This method finds twice as many carriers as the traditional method. **A reflection on the routine screening technique would seem to be in order, in terms of cost-effectiveness for this technique in clinical management of ESBL-PE.**

Identified **risks factors** are **different from each point in the environment. About mobile table, risks factors are : Men, permanent urinary catheter and ESBL-carriage for overall flora, and permanent urinary catheter for Enterobacteria.** These risk factors could require a more manipulative number in the genital area, which could explain a greater dissemination. Further studies are needed to confirm the presence of protective factors.

The **major limit** of this study is the **number of patients**. This smaller number of patients make results from the regression not very robust. It will be interesting to duplicate this study with a higher number of patients, to verifying results and potentially highlight new risk factors.

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