

Poor sensitivity of perineal vs. rectal swabs for detecting ESBL Enterobacteriaceae

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1. Introduction

- Extended-spectrum beta-lactamase Enterobacteriaceae (ESBL-E) and other resistant Enterobacteriaceae such as carbapenem-resistant Enterobacteriaceae (CRE) colonise the gut, so screening requires a sample from the rectal / perineal region or stool specimen.
- Perineal swabs are less invasive than rectal swabs, so preferable in terms of staff and patient acceptability.
- Therefore, we compared the sensitivity of rectal and perineal swabs for detecting ESBL-E.

2. Methods

- 4392 patients were approached within the first 72 hours of their admission and provided a rectal and perineal swab.
- Swabs were cultured on chromogenic media for ESBL-E.
- Each patients was asked a series of questions relating to risk factors.
- ESBL-E detection rates and risk factors were analysed using Fisher's exact tests.
- The study was approved by the NHS Research Ethics Committee.

Fig 1: Rate of ESBL carriage from rectal vs. perineal swabs

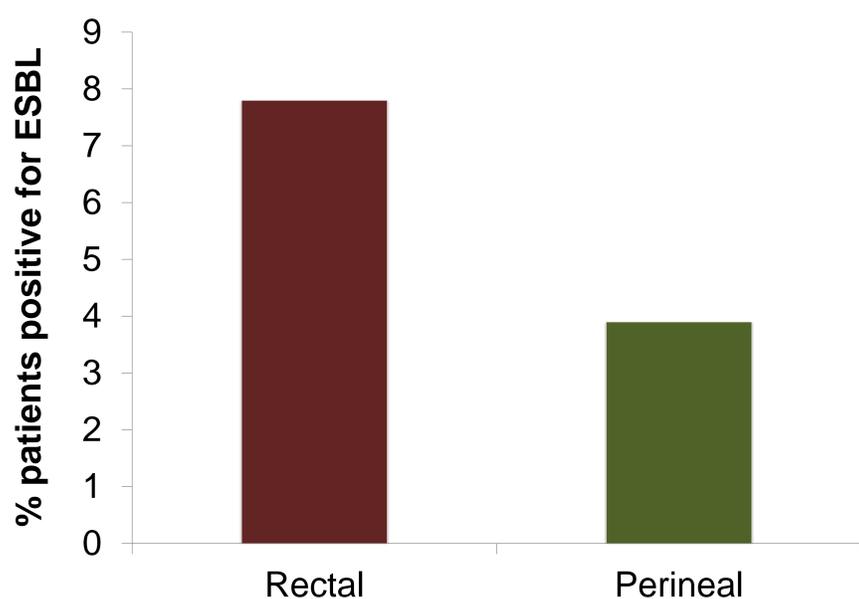


Table 1: Risk factors for ESBL

Risk factor	N pts with risk factor	% ESBL (risk factor)	% ESBL (without risk factor)	p value
Non-UK residents	47	10.6%	8.4%	0.6171
Overseas travel in the past 12 months	1358	9.1%	8.1%	0.3489
Overnight hospital stay in the past 12 months - GSTT	1459	9.9%	7.7%	0.0242
Overnight hospital stay in the past 12 months - within M25	1703	10.0%	7.4%	0.0059
Overnight hospital stay in the past 12 months - any UK	1895	9.3%	7.7%	0.0936
Overnight hospital stay in the past 12 months – overseas	42	23.8%	8.3%	0.0019
Antibiotics in the past 6 months - one course	1269	7.6%	8.8%	0.2697
Antibiotics in the past 6 months - >1 course	1103	11.8%	7.2%	0.00002

3. Results

- ESBL-E was cultured from 354 (8.1% of patients overall); 81% were *E. coli*, 8% were *K. pneumoniae*.
- Rectal swabs were significantly more sensitive for detecting ESBL-E than perineal swabs: 331 (7.5%) vs. 165 (3.8%), $p < 0.001$ (Fisher's exact test) (Fig 1).
- Risk factors for ESBL-E were common in the group screened, with 3439 (78%) of patients having one or more risk factors.
- Risk factors significantly associated with ESBL-E carriage included: overnight hospital stay in the past 12 months at GSTT, within the M25, or overseas; and more than one course of antibiotics in the past 6 months (Table 1).
- Almost a quarter (24%) of patients with overseas hospitalisation in the past 12 months carried ESBL-E.

4. Discussion

- Although perineal swabs would be preferable to rectal swabs in terms of patient acceptability, our data suggest that they are significantly less sensitive for detecting ESBL-E – detecting only around half of carriers.
- This has clear implications for the detection of other resistant Enterobacteriaceae, most notably CRE.
- We did not evaluate the performance of an anal or perianal swab (without sampling the rectum), which could be the subject of further studies.
- We recommend rectal swabs for detecting carriage of resistant Enterobacteriaceae.
- Risk factors for ESBL-E carriage related to overnight hospitalisation both in the UK but especially abroad.
- Admission screening for ESBL-E may be useful to prevent cross-transmission, but would place a considerable burden on limited isolation facilities.