Planning to halve GNBSI: getting to grips with healthcare-associated *E. coli* BSI sources

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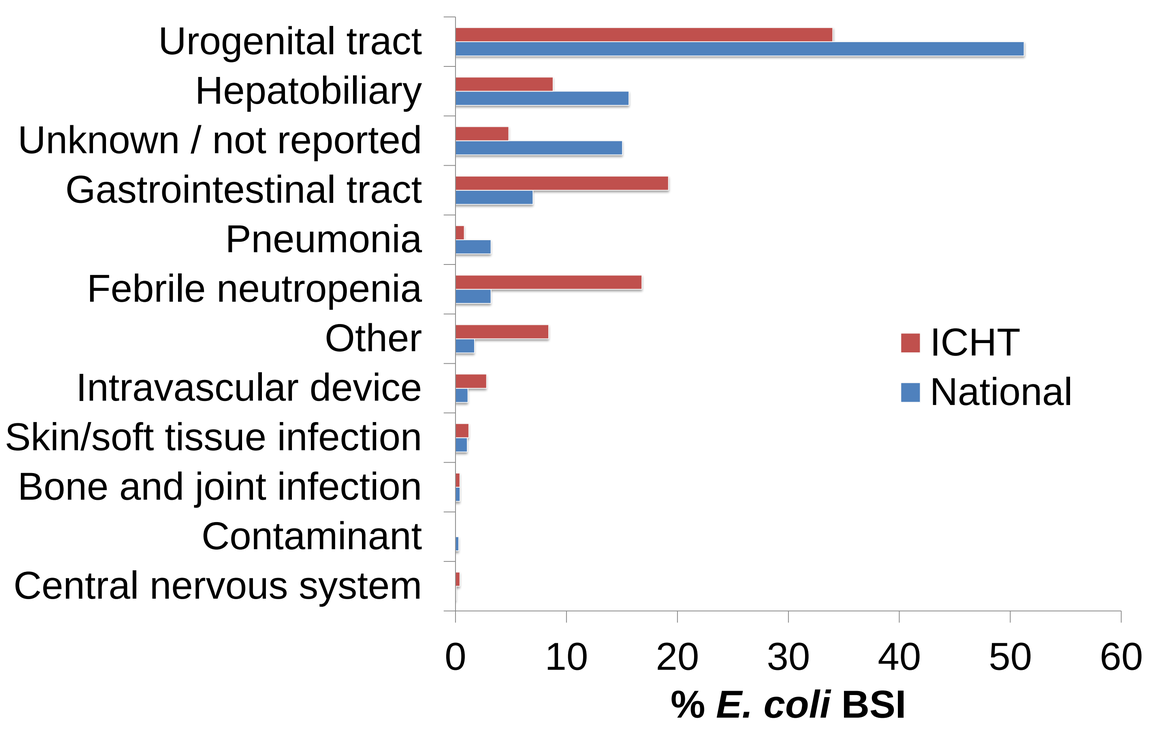
1. Introduction

- Our hospital group has experienced an increase in *E. coli* bloodstream infections in recent years, in line with national trends.[1-3]
- The government has announced an ambition to halve Gram-negative BSIs (GNBSIs) by 2021.
- A recent national study suggested that more than 50% of the combined hospital and community-onset *E. coli* BSIs had a urinary source.[1]
- In order to focus prevention initiatives, a thorough local understanding of the sources of *E. coli* is required.

2. Methods

- A deduplicated database of all *E. coli* BSI identified in patients on or after their second day of admission from April 2014 to March 2017 was analysed.
- The source attributions were assigned by a multidisciplinary approach involving the IPC service and clinical microbiology.
- Epidemiological associations with a urinary source of BSI were analysed using univariable and multivariable binary logistic regression models in SPSS.

Figure: *E. coli* BSI sources nationally[1] vs. locally



Note: the national dataset includes community-associated and hospital-associated cases, whereas the local dataset includes only hospital-associated cases.

Table: Risk factors for a urinary source

Variable	Not urinary source (n=153)		Urinary source (n=85)		p	OR (95% CI)
	n	%	n	%		
Median age (range)	62 (0-95)		69 (0-96)		0.024	**1.02 (1.00-1.05)**
Female gender	39	50.0%	39	50.0%	0.040	**2.0 (1.0-4.0)**
Speciality					0.481	
Medicine	42	53.8%	36	46.2%	Ref	
Private patients	1	20.0%	4	80.0%	0.177	-
Surgery	87	73.1%	32	26.9%	0.199	0.6 (0.3-1.3)
Women & Children	23	63.9%	13	36.1%	0.82 5	1.2 (0.3-4.5)

Duration of hospitalisation was not significant in univariable analysis so was excluded from the multivariable model. OR = odds ratio. CI = 95% confidence interval.

3. Results

- 250 cases were identified.
- The most common source was urinary (84 cases (34%), 29 (12%) being urinary catheter-associated UTIs), followed by the gastrointestinal tract (48 cases, 19%), BSIs associated with febrile neutropenia (42 cases, 17%) were the third most common group, then hepatobiliary sources (22 cases, 8.8%).
- This differed considerably from the national picture (Figure).
- An indwelling vascular device was the source in 7 cases (3%) and SSI the source in only 3 cases (1%).
- Female gender (odds ratio 2.0, 95% confidence interval 1.0-4.0) and older age were significantly associated with a urinary source (Table).

4. Discussion

- Although the urinary tract was the most common source of *E. coli* BSIs identified in hospital inpatients (approximately a third of which were urinary catheter-associated) it was not as common as that seen in a national study of *E. coli* BSI sources, which included community infections.[1]
- Older, female patients were significantly associated with a urinary BSI source, in line with other studies.[3,4]
- This suggests that improved management of hospital-onset urinary tract infection may reduce the rate of *E. coli* BSI.
- However, almost 40% of cases were from the gastrointestinal tract or associated with febrile neutropenia, which may offer less potential for interventions aimed at reduction.

References

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3. Bou-Antoun *et al. Euro Surveil* 2016;21.
4. Fortin *et al. Infect Control Hosp Epi* 2012;33:436-462.

Disclosures: JO is a consultant to Gama.

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