



Practice points

Preventing *Escherichia coli* bacteraemia through optimized hospital hydration: an inpatient survey on drinks consumption on care of elderly wards

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ARTICLE INFO

Article history:

Received 19 March 2019

Accepted 21 March 2019

Available online 27 March 2019



Dehydration may be associated with urinary tract infection and the development of *Escherichia coli* bacteraemia [1,2]. The elderly are vulnerable to dehydration due to age-related changes in physiology, and physical and cognitive impairment; they are also at greatest risk of developing *E. coli* bacteraemia [3,4]. Quality improvement work at East Berkshire Clinical Commissioning Group in south-east England has reduced the incidence of urinary tract infection in care homes by 33% through improving hydration [5]. Dehydration may persist throughout hospital admission; a prospective, cohort study found that 62% of dehydrated elderly patients at admission remained dehydrated 48 h later [3]. Moreover, local prospective analysis of hospital-onset *E. coli* bacteraemia at University College London Hospital (UCLH) identified an association between clinical presentations of dehydration and *E. coli* sepsis (E. Wiley, personal communication).

In light of these observations, a multi-disciplinary *E. coli* hydration working group was convened at UCLH comprising infection specialists, dietitians, speech and language therapy, estates and facilities, the Clinical Commissioning Group Quality and Safety lead, and medical students.

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A cross-sectional patient survey was designed and conducted at two care-of-the-elderly wards ($N = 27$) to quantify inpatient drinks consumption, understand barriers to drinking, and gauge hydration health literacy. The latter was an in-person, patient self-completion questionnaire with verbal prompting by two medical students. Survey design was informed by the multi-disciplinary team, elderly care ward nurses, and the patient experience team. All inpatients on a long-stay care of the elderly ward were included. Exclusion criteria were patients with cognitive impairment (as assessed by nurse responsible for their care) and those not allowed oral intake or on fluid restriction. The survey was developed iteratively following a five-patient pilot. Data were collected on a single day, sampling bay-by-bay following approvals from the nurse-in-charge. Ethical approval was not required as this formed part of a service evaluation.

Based upon European Food Safety Authority guidelines, which recommend a minimum daily fluid intake of 2 L for women and 2.5 L for men (20% of which may be derived from food), a minimum of 1.5 L/day was set as a quality improvement goal [6].

A total of 27 patients were sampled (16 male, 11 female; three aged 40–59 years, six aged 60–74 years, 13 aged >75 years). Twenty-five were in an open bay and two in a single room. Seventy percent (19/27) of patients rated hydration as 'very important' for health, yet only 11% (3/27) met the minimum recommended fluid intake of 1500 mL/day (about eight small cups). Sixty-seven percent (18/27) of patients drank half the recommended fluid intake or less (see Figure 1). Patients were happy with the selection of drinks offered by the hospital (mainly tea, coffee, and fruit juice). Fifty-nine percent (16/27) of patients reported that water jugs were changed once a day or less. Barriers to adequate patient hydration included lack of thirst (18.5%), inability to reach their jug or drink at all times due to physical impairment (22.5%), and polystyrene cups which patients described as hard to grasp and liable to spill. The two patients in single rooms reported jug changes of once and less than once a day, and they had the lowest total fluid consumption of one to three cups/day (0.3–0.6 L).

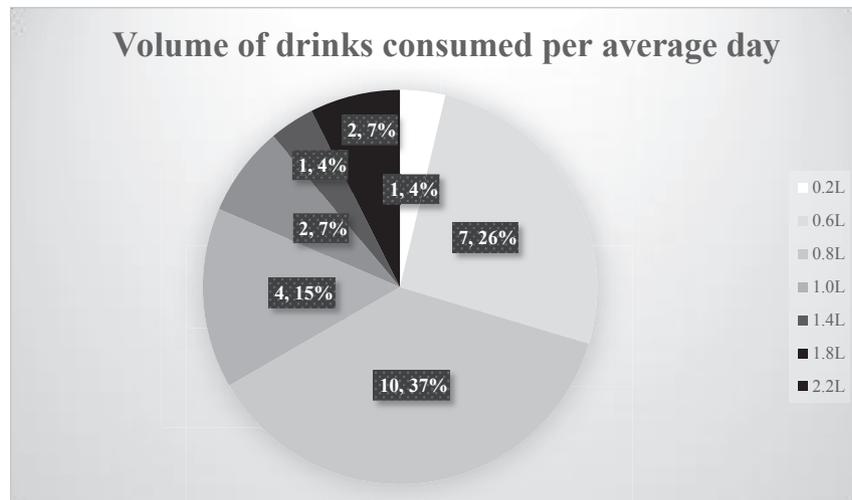


Figure 1. Reported number of drinks consumed throughout one day in litres ($N = 27$). Numbers displayed in the pie chart correspond to absolute numbers and percentages of patients for each volume category.

Limitations of the study included a limited sample size, recall bias and the exclusion of patients with cognitive impairment. Whilst capacity limited their involvement, this may be an important population of patients to explore in future studies as they may face additional barriers to adequate hydration.

Hydration of elderly inpatients remains a significant challenge and this presents opportunities for the prevention of Gram-negative sepsis in a high-risk group. Ensuring prompting and support is available to patients that need it and ensuring that the positioning of drinks and tables is appropriate to physical needs may improve hydration status, especially for less visible patients in single rooms. The hospital catering contract includes provision for twice-daily jug changes, yet this survey suggests that this may not be occurring. Best practice recommendations are thrice-daily jug changes for fresh, palatable, chilled water that will enhance patients' drinking experience [7].

In response to these results, a hospital-wide hydration education campaign was launched as part of National Hydration and Nutrition awareness week including promotional stands, events, posters, and staff bulletins. Following presentation to the hospital Hydration and Nutrition Steering Group, there was a restoration of twice-daily jug changes on every ward as per contract. Funding was secured for a project lead on a hospital food and drink strategy to include improved hydration for patients and staff. A business case was made to halt planned efficiency savings targeting drinks provision. Other recommendations included greater promotion of the hospital's volunteer drinks purchasing service and the procurement of sturdy cups.

Further research on the relationship between hydration and Gram-negative bacteraemia is warranted. Hospital-onset *E. coli* bacteraemia in the elderly should be seen as preventable.

Conflict of interest statement

None declared.

Funding sources

None.

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