Heart & Lung 43 (2014) 13–18

Contents lists available at ScienceDirect

Heart & Lung

journal homepage: www.heartandlung.org

Implementing selective digestive tract decontamination in the intensive care unit: A qualitative analysis of nurse-identified considerations

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ARTICLE INFO

Article history:
Received 21 February 2013
Received in revised form
5 September 2013
Accepted 5 September 2013
Available online 14 November 2013

Keywords:
Antibiotic prophylaxis
Critical illness
Implementation
Selective decontamination of the digestive tract
Ventilator-associated pneumonia

ABSTRACT

Objective: To describe factors senior critical care nurses identify as being important to address when introducing selective digestive tract decontamination (SDD) in the clinical setting.
Background: Critically ill patients are at risk of developing ventilator-associated pneumonia (VAP). SDD is one strategy shown to prevent VAP and possibly improve survival in the critically ill.
Methods: We performed a secondary analysis of qualitative data obtained from 20 interviews. An inductive thematic analysis approach was applied to data obtained from senior critical care nurses during phase two of a multi-methods study.
Results: There were four primary considerations identified that should be addressed or considered prior to implementation of SDD. These considerations included education of health care professionals, patient comfort, compatibility of SDD with existing practices, and cost.
Conclusions: Despite a lack of experience with, or knowledge of SDD, nurses were able to articulate factors that may influence its implementation and delivery. Organizations or researchers considering implementation of SDD should include nurses as key members of the implementation team.

Introduction

Critically ill patients are at risk of developing infectious complications[1] because of increased severity of illness, poor nutritional status[2] and the need for invasive devices. More than half of patients admitted to an intensive care unit (ICU) will develop an infection, the majority (80%) of which are endogenous infections caused by oropharyngeal or digestive tract microflora present on admission.[3] The most common infection acquired in the ICU is ventilator-associated pneumonia (VAP) with at least a quarter of all ICU patients affected.[4] The impact of VAP on patient outcomes is substantial. VAP is associated with prolonged length of ventilation, increased ICU and hospital stay, greater costs, and higher mortality.[5]

Selective digestive tract decontamination (SDD) is a prophylactic strategy which aims to reduce infections and improve mortality in critically ill patients by eradicating potentially pathogenic microorganisms in the oropharynx and digestive tract.[6] SDD is a

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0147-9563/$ – see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.hrtlng.2013.09.002

four stage process which includes: 1) a four day course of parenteral antibiotics to control potentially pathogenic microorganisms present on admission; 2) administration of non-absorbable antimicrobials (normally polymyxin E, tobramycin and amphotericin B) to the oral cavity and gastrointestinal tract; 3) continuation of standard hygiene measures to control exogenous infections; and 4) cultures of the throat and rectum on admission and then twice weekly to assess the efficacy of SDD and identify emergence of resistant bacteria.[7,8]

SDD, when fully implemented, has been shown to prevent VAP and, in some studies, improve survival.[9,10] The effectiveness of SDD has been demonstrated in numerous randomized controlled trials with results showing that SDD significantly reduces gram-negative microorganisms in the oropharyngeal cavity[11] and reduces lower airway infections by 72%.[12] Although a 2006 meta-analysis of 36 randomized controlled trials did not find evidence of antimicrobial resistance,[13] the use of SDD in clinical practice remains low because of the perception that this strategy will increase the development of resistant bacteria. Much of the SDD research has been conducted in Europe and in clinical environments with already low rates of resistant bacteria such as methicillin-resistant *Staphylococcus aureus*.[14] Consequently clinicians who work in environments where resistant bacteria are present question the applicability of these data to their clinical context.

While there are divergent views on the use of SDD as a strategy to prevent the development of VAP, there is strong evidence that SDD significantly reduces the number of lower respiratory tract infections and mortality.[6] Recommendations to consider using SDD for patients ventilated for more than 48 h has been included in the VAP prevention guidelines produced by The British Society for Antimicrobial Chemotherapy[15] and more recently in the Surviving Sepsis Campaign Guidelines.[16] It is likely with the growing body of evidence for SDD, and its inclusion within well-respected and implemented clinical guidelines, that nurses will soon be required to deliver SDD medications to critically ill patients. However, most critical care nurses are unfamiliar with SDD as a strategy to prevent infections in the critically ill. With a large international clinical trial planned and the inclusion of SDD as a recommendation within the most recent Surviving Sepsis Campaign Guidelines,[16] it is likely that SDD as a strategy to prevent infection may be introduced more widely into practice.

To explore why SDD has not been widely adopted in clinical practice we undertook a program of research to describe barriers to SDD implementation and identify what further evidence is required before full scale clinical implementation would be considered appropriate and feasible has been completed.[17] The, multimethod study was undertaken in Canada, the United Kingdom (UK) and Australia/New Zealand (ANZ) from 2010 to 2012 to develop an understanding of issues related to current lack of adoption of SDD and considerations for its implementation into clinical practice. The full study protocol has been published elsewhere.[17,18] Stage 2 of this research program was a Delphi study to identify the range of stakeholders' beliefs, views and perceived barriers relating to the use of SDD. The aim of this paper is to describe factors senior critical care nurses identified during round one of the Delphi study as being important to address when introducing SDD in the clinical setting.

Methods

The Delphi technique was used to identify participant's self-reported knowledge of SDD as well as their beliefs, views and perceived barriers to adoption and implementation of SDD. The Delphi technique uses a structured, iterative process including anonymized feedback, in a series of sequential questionnaires or 'rounds.' We used the Delphi technique to assess levels of agreement on SDD within an expert group.[19,20] The first Delphi round comprised semi-structured qualitative interviews with the interview topic guide based on the Theoretical Domains Framework[21] of clinical behavior change. The interview topic guide incorporated questions to elicit participants' views on the conduct and design of SDD research (Table 1).

One hundred and forty one participants completed the first Delphi round. Ethical approval was obtained from relevant institutional review boards and each participant gave informed consent prior to the conduct of the interviews.

The substudy of senior nurse participants

We conducted a secondary analysis of qualitative data collected from nurse participants during the first Delphi round.[17] This secondary analysis allowed us to explore in more detail factors senior critical care nurses identified as being important to address when introducing SDD in the clinical setting, which was not a specific focus of the first Delphi round. We included data from all nurse participants ($n = 20$), a sample size that is similar to that reported for other secondary analyses of qualitative data.[22] The majority of participants were female (85%; $n = 17$) and worked in a tertiary level ICU (80%; $n = 16$). The mean length of ICU experience was 22.1 years (Table 2). All nurse participants were employed in management or educational leadership roles and were responsible for implementing practice change within the ICU.

We specifically analyzed a subset of interviews from nurse participants in order to focus on an aspect of the data which was not specifically addressed in the primary study and to specifically analyze data from one participant group who had shared characteristics that distinguished them from the larger sample.[22] This secondary analysis of the data allowed us to explore issues nurse participants identified as important for the implementation of SDD.

Data collection

During the first Delphi round research teams in each geographical region conducted interviews by telephone. Interviews lasted 20–60 min and were recorded and transcribed verbatim. All identifying information was removed to maintain privacy and confidentiality.

Data analysis

In conducting this secondary analysis we employed an inductive approach[23] where detailed readings of the raw data allowed for open coding, categorization and abstraction of specific concepts and themes.[24] Although the interview guide was informed by the Theoretical Domains Framework,[21] we did not use this framework in our analytic approach and instead allowed the themes to emerge from the interview data. Interviews were read multiple times by three authors (AM, LW, LR) who each independently open coded the data. Through discussion a consensus approach to abstraction allowed for identification of themes. Data were coded into themes using NVivo 9 software (QSR International, Doncaster, Australia).

Results

Nurse participants identified a number of factors they believed might impact the implementation of SDD in the clinical setting. Lack of knowledge about SDD was identified as an important barrier that would need to be addressed prior to implementing SDD in practice. Additional factors identified and thematically grouped were risk to the patient, the impact of SDD on nursing practice and the impact of SDD on the organization.