

Predisposing Factors for the Occurrence of Urinary Tract Infection Associated with the Use of Vesical Delay Catheter

ORIGINAL

Cecilia Danielle Bezerra Oliveira¹, Austriberta de Araújo Alves²,
Maria do Socorro Alves Silva Lúcio³,
Jessika Lopes Figueiredo Pereira⁴,
Gláucia de Souza Abreu Alencar⁴, Silmara Pereira Lima⁴,
Cicero Roniere Alves⁵, Inacia Satiro Xavier França⁶

- 1 Nurse, Master Professor in Nursing, Technical School of Health of Cajazeiras, Federal University of Campina Grande. Cajazeiras, Paraíba, Brazil.
- 2 Nurse, Federal University of Campina Grande. Campina Grande, Paraíba, Brazil.
- 3 Nurse, Master Professor in Nursing, Federal University of Campina Grande. Campina Grande, Paraíba, Brazil.
- 4 Nurse, Master in Public Health, State University of Paraíba. Campina Grande, Paraíba, Brazil.
- 5 Nurse, Federal University of Campina Grande. Campina Grande, Paraíba, Brazil.
- 6 Nurse, Doctor Professor in Nursing, State University of Paraíba. Campina Grande, Paraíba, Brazil.

Abstract

Objective: To evaluate the predisposing factors for occurrence of Urinary Tract Infection associated with the maintenance of indwelling catheters in patients in an Intensive Care Unit.

Methods: Exploratory, descriptive study with a quantitative approach carried out in the Adult Intensive Care Unit of a University Hospital of the Federal University of Campina Grande, Paraíba. The sample consisted of 21 patients who used the Vesical Delay Catheter (CVD). The results were analyzed using statistical methods, performed tabulation and organization of data for analysis and discussion.

Results: Of the patients (87.5%) who were using CVD, of which (57.15%) were women and (43.85%) men. Among the main medical diagnosis was the prevalence of lung (18.75%). Among the internal participants, 67.7% were discharged with CVD. Upon the evaluation of CVD, the item that was not adequate corresponds to the fixing of the catheter.

Conclusion: On the study realized, it was found the need for staff to be attentive to the proper handling of the CVD, attention for proper insertion technique, control the length of stay, participation in training programs, aimed at preventing the urinary site and dissemination of microorganisms.

Contact information:

Cecilia Danielle Bezerra Oliveira.

 cecilia.dbo@gmail.com

Keywords

Urinary Catheterization;
Intensive Care Units; Hospital
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Introduction

Hospital infection is a negative indicator of clinical outcome in patients and is associated with increased morbidity and mortality in intensive care patients [1-2]. It is characterized as something that contributes to the considerable increase in the cost of treatment, creating a huge challenge to be faced by the government, which entails major social consequences [3].

It is in the Intensive Care Unit (ICU) that hospitalized patients are more susceptible to infections, and this happens generally because of the severity of the clinical picture of the same, as well as the exposure to invasive procedures, such as the Bladder Delay Catheterization [4].

It is noteworthy that the use of indwelling catheters (CVD) for ICU patients is common, it is estimated that 13% of these patients are indicated for bladder catheterization, either due to their clinical condition, or even for adequate water measurement, since in this environment the customer remains under constant surveillance and monitoring of vital functions [5]. Thus, because they are often exposed to this procedure, become increasingly vulnerable to urinary tract infection development (ITU) [6].

Thus the ITU are responsible for about 45% of nosocomial infections, of which 80% are related to the use of CVD. In ICU patients, it is known that the risk for complications from CVD could reach 26.9%, when it reaches six or more days of use. Another problem relates to the large number of multidrug-resistant bacteria strains for the treatment of UTI, in inpatients in this sector, which makes the treatment costly as it should be done the use of the latest generation of antibiotics [6-7].

It is worth noting that the main factors capable of triggering the ITU are: the failure in the technique execution in the passage of the probe, inappropriate gauge of the catheter, lack of asepsis in the circuit handling, use of unsuitable collectors, among others [6-7]. Thus, nursing plays an important role in the prevention of UTI, both as regards the use

of aseptic technique for performing the CVD, as in the care of maintenance and length of the catheter, providing greater patient comfort and preventing possible complications.

Thus, the identification of factors that lead the patient hospitalized in ICUs to develop ITU related to the use of CVD may contribute to the development of the occurrence of prevention mechanisms of this infection in these patients. So, know the care practices of the nursing care team against this procedure becomes essential in building a holistic care, and favors the reduction of infection rates and other events that may jeopardize the safety and well being of the patient.

Therefore, this study aimed to evaluate the predisposing factors for Urinary Tract Infection occurrence associated with the maintenance of indwelling catheters in patients in an Intensive Care Unit.

Methods

This is an exploratory, descriptive study with a quantitative approach carried out in the Adult Intensive Care Unit of a University Hospital of the Federal University of Campina Grande, Paraíba (HU-UFCG).

The population consisted of all patients admitted to the adult intensive care unit of the HU-UFCG in the months of April and May of 2014. The sample consisted of 21 patients who used the Vesical Delay Catheter (CVD), during the hospitalization in the period of data collection.

The research was done through the development of a plug, in which data were collected from the patient's record, regarding age, sex, diagnosis, as well as data related to the use of CVD.

This study also used systematic observation regarding the indicator of evaluation of CVD conditions of use, which was used a tool that is available in the Hospital Infection Control Practices Evaluation Indicators Manual, which is considered a process indicator constituted of five components: a closed system, adequate fixation, urine volume below two

thirds of the level of the collection bag, collection bag below the bladder and clear urinary flow [8].

The results were analyzed using statistical methods, with the help of Microsoft Excel Software 2010 version, allowing the tabulation and organization of data for analysis and discussion based on studies relevant to the topic.

The research project was analyzed and approved by Ethics and Research Committee Involving Human Beings, State University of Paraíba - CEP/UEPB with Opinion No. 30606714.8.0000.5187.

Results

During the period of data collection, 24 patients were admitted to the ICU; 21 of these (87.5%) were using the Vesical Delay Catheter, among them, 12 (57.15%) were women and 9 (43.85%) were men, aged between 20 and 90 years. It was predominant in patients over 61 years old (46.61%).

The investigated ICU is reference in infectious diseases, therefore, often receive patients who remain hospitalized for long periods. In order to analyze the relationship between ITU and use of CVD, we tried to observe what would be the most common medical diagnoses among the users of the service in question.

It can be seen in **Table 1**, the frequencies of major medical diagnostic presented by the patients included in this study.

It is verified, between the main medical diagnostics, the predominance of Lung Diseases and Others with 18.75% each, followed by sepsis and acute respiratory failure with 15.6% and 12.5% respectively.

Table 2 shows the investigation of the use and non-use of CVD in the admission and discharge of patients in the ICU.

It is observed that 23.8% were using CVD before being admitted to the ICU and 76.2% underwent CVD during the hospital stay in the sector. It is evident that of the 21 internal participants, 67.7% were discharged with CVD.

Table 1. Major medical diagnosis of internal ICU patients.

| Diagnoses | N | % |
|--------------------------------|---|-------|
| Lung Diseases | 6 | 18.75 |
| SEPSIS | 5 | 15.6 |
| Accute breathing insufficiency | 4 | 12.5 |
| AIDS | 3 | 9.4 |
| gastroenterecolitis | 2 | 6.25 |
| Water-Electrolyte disorder | 2 | 6.25 |
| Acute Renal Failure | 2 | 6.25 |
| Immediate postoperative | 2 | 6.25 |
| Others | 6 | 18.75 |

Source: Patients, ICU. Campina Grande in 2014.

Table 2. Use and non-use of CVD in the Admission and Discharge at ICU.

| Patients | Admission | | Discharge | |
|---------------|-----------|------|-----------|------|
| | N | % | N | % |
| Using DSC | 5 | 23.8 | 6 | 67.7 |
| No use of CVD | 16 | 76.2 | 3 | 33.3 |

Source: Patients, ICU. Campina Grande in 2014.

Table 3. Components of the Assessment Indicator of the Conditions of CVD.

| Component observed | Appropriate | | Inappropriate | |
|---|-------------|-----|---------------|-------|
| | N | % | N | % |
| Closed system | 488 | 100 | 0 | 0 |
| Adequate fixing | 0 | 0 | 488 | 100 |
| Catch bag below the bladder | 488 | 100 | 0 | 0 |
| Urine volume below 2/3 of the stock level | 69.88 | 341 | 147 | 30.12 |
| Clear urine flow | 488 | 100 | 0 | 6.25 |

Source: Patients, ICU. Campina Grande in 2014.

In **Table 3**, there is the analysis of the adequacy of the maintenance conditions of the CVD and five pre-established criteria in the data collection instrument were observed: closed system, adequate fixation, collection bag below the level of the bladder, urinary volume down two-thirds of the maximum level of the collection bag and clear urine flow.

In the observations of the closed drainage system criterion was detected that all collection bags had

closed system, and do not present leaks, resulted in 100% fit.

In probe fixing criterion, it was observed that no catheter was properly set, that is, on the inner side of the thigh in women and in the hypogastric region, in men, leading to inadequacy in 100% of patients.

During the observations, 100% of the collection bags were properly positioned below the level of the bladder. As the clear urinary flow criterion, was observed 100% of fitness during the collection period.

It was evident as the criterion urine volume below two thirds of the bag level, failure in this component, since it is frequent the occurrence of observations where the level was above the recommended to the patient safety, in prevention of UTI, and 30.12% observations considered inadequate and 69.86% adequate.

Discussion

The ICU, due to the high number of invasive procedures to which patients are submitted, must be a priority unit regarding the systematization and evaluation of care processes. Thus, the prevention and control of infections related to the use of CVD is included as essential elements in reducing hospital infection levels, which shows the importance of studies that demonstrate the CVD maintenance conditions, as well as the factors that can lead to the occurrence of urinary tract infection [9].

It is noteworthy that some conditions related to the patient may favor the installation of an infection. In this study, there was a predominance of patients aged over 61 years, which may contribute to the occurrence of infectious processes due to decreased immunity, common in the elderly, and many of them present basic diseases that, associated with long-term in a hospital environment and the use of antimicrobial therapy, favor the microbial resistant emergence [10].

Another important factor that should be taken into account is with regard to the sex of the patient. Considering that 70% of cases of urinary tract infection, in women, are related to colonization of the perineal region by bacteria that reach the bladder by periurethral mucus surrounding the catheter. In the case of male patients, only 30% of urinary tract infections related to Bladder Delay catheter are related to the urethral previous colonization by the same infectious agent [11].

It highlights the epidemiological characteristics of ICU patients present in the study, because they present diagnosis of infectious diseases, capable of making the individual susceptible to occurrence of other infections, such as the ITU, which confirms a survey conducted in the ICU of a University hospital, where the major reason that lead most patients on admission were also infectious diseases, which in this case because they are in intensive care, require clinical and invasive specific monitoring, and such these procedures as loitering in the sector are factors that influence the occurrence of infection [12].

Regarding the care of the catheter, from the perspective of prevention of infection, most of the criteria evaluated in this study were suitable for determination of the proposed clinical protocol. However, it was observed that the criterion that showed the greatest inadequacy index was the fixing of the probe, which despite being a simple practice, was disregarded by professionals during the study. It is shown that the correct technique has not been incorporated into the daily practice of the staff. The failure in this component is relevant to the quality of care in maintaining the CVD, since the urethral injury may be related to the lack of fixing the probe, and their consequent traction during the movement of the patient, can be characterized as a major component [9].

Another criterion that was analyzed and demonstrated inadequacy was the maintenance of urine volume below 2/3 of the stock level, because they were not in accordance with the rules, in which

case it is necessary that it be obeyed because they are configured as a useful tool for the prevention of infection control, as it allows systematic evaluations of interventions and thus, educational strategies propositions targeted and in ways that are more structured [13].

Regarding the other criteria, that were: closed system, collection bag below the bladder and clear urinary flow, they were adequate for the recommending by the clinical protocol in 100% of the evaluations, demonstrating that these care are incorporated into daily routine of nursing team on the service concerned, showing that these practices are helping to reduce the risk of the urinary tract infection

However, it is important to note that separate indicators analysis are not sufficient to identify the factors that lead to UTI, because this complication, but these indicators are more accurate when related to evaluation of aspects of the procedures that can lead to infection. Thus, it is necessary a more thorough assessment of the patient's situation, coupled with the use of the device and appropriate technology in the perspective of preventing risks to the health of the patient [14].

In this sense, it is important to note that CVD is a procedure that involves the management of materials, equipment, people and processes, and actions aimed at respect and patient safety, procedure and documentation. Therefore, this procedure still requires attention from professionals, because despite the existence of updated protocols about the install and maintain the bladder catheterization, also it is observed the oversights as the execution of it, thus contributing to the emergence of infection [15].

Conclusion

Nursing professionals in their daily practices are responsible for procedures able to bring relief and to meet the needs of patients, but can also trigger some risk. For both the nursing make use of pro-

ocols that guide the practices and to ensure the patient safety.

Therefore, before the study realized, it was found the need for staff to be attentive to the proper handling of indwelling catheters in continuous attention for proper insertion technique, control the length of stay, as well as participate in training programs, aimed at prevention of urinary site and spread of microorganisms.

A limitation found in the study was made because the observation was carried out partially in a short period of time, so it was not possible to assess whether professionals kept closed the system to erect the collection bag during patient care.

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