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RESEARCH ARTICLE

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INCIDENCE AND FACTORS ASSOCIATED WITH CONSTIPATION IN INTENSIVE CARE

Ericka VilarBôto Targino¹, Elismar Pedroza Bezerra², Ingrid Bergmamdo Nascimento Silva³, Tatiana Rodrigues da Silva Dantas⁴, Helga de Souza Soares⁵, Lúcia Medeiros Di Lorenzo Carvalho⁶, Carlos Cesar Silva Alves⁷, Suzanna valeria Oliveira de Souza⁸, Danielle Silva de Meireles⁹ and Sergio Vital da Silva Junior^{*10}

¹Nurse, University Hospital Lauro Wanderley-HULW/Federal University of Paraíba-UFPB, Specialist in Nutritional, Parenteral and Enteral Therapy; ²Nurse, Master's Student in Geriatrics and Gerontology-UFPB.HULW/UFPB, Specialist in Occupational Nursing and Family Health; ³Nurse, Master in Decision and Health Models, UFPB; ⁴Nurse, Master in Nursing; ⁵Specialist in Public and Private Health System Audit; Specialist in Hospital Infection Control and Specialist in Higher Education Teaching; ⁶Military nurse. Hospital de Guarnição de João Pessoa; ⁷Nurse, Master in Health Sciences, HULW/UFPB; ⁸Nurse, Specialist in Surgical Center and Sterilized Material Center; ⁹ Nurse, Specialization in Nephrology and Public Health; ¹⁰Master in Nursing from UFPB, Doctoral student in nursing at the Federal University of Paraná, Nurse in the Hospital Metropolitan Dom José Maria Pires, Santa Rita, PB, Brasil

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***Corresponding author:**
Agyemang Kwasi Sampene

ABSTRACT

Despite being a complication that is commonly identified in severe patients, constipation is not a frequent topic in intensive care journals. In Brazil, little is known about constipation in critically-ill adults. The objective of this study is to assess the incidence and factors associated with constipation in critically-ill patients by means of an integrative review conducted from 2016 to 2020 in the following databases: BVS, LILACS, SciELO and PUBMED. The following descriptors were adopted to find the articles: *Constipação intestinal* (Constipation; *Estreñimiento*); *Cuidados críticos* (Critical Care; *Cuidados Críticos*); *Terapia Intensiva* (Intensive Care; *Cuidados Intensivos*). A total of six papers were selected in which the main findings correlated with constipation were as follows: increased mortality in the ICU, increased length of stay, and increased need for mechanical ventilation in critically-ill patients. The study also revealed that late enteral nutrition, use of sedatives and surgery were independent risk factors for late bowel evacuation, and that the number of days of use of medications acting on the gastrointestinal tract is an independent protective factor for constipation. New studies are necessary to elucidate the effects of intestinal constipation in the prognosis of critically-ill patients. Given these findings, it becomes necessary to devise protocols and action plans to prevent and treat this disorder in intensive care units.

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INTRODUCTION

The Intensive Care Unit is defined as an area equipped with advanced technology and a trained multi-professional team to provide care for potentially recoverable patients with single or multiple organ support needs and who benefit from detailed monitoring and invasive treatments (NATES et al., 2016). According to the European Society for Clinical Nutrition and Metabolism (ESPEN, 2009) guidelines, a critically-ill patient is the one who develops a systemic inflammatory response associated with organ failure, and who is expected to require support for organ function for at least 3 days. Constipation reaches incidence values from 15% to 83% in patients hospitalized in Intensive Care Units. This variation is due to the lack of a universally accepted definition (GARCIA et al., 2016).

According to the available studies, constipation was defined as absence of stool passage between three and six days after ICU admission (PRAT et al., 2016). Critically-ill patients are at risk for constipation and diarrhea due to several factors, such as: dehydration, administration of sedatives or analgesics, reduced mobility, mechanical ventilation, or the disease process itself (DIONÍZIO; CRUZ, 2019). The consequences of constipation can lead to complications which vary from irritation to intestinal perforation. Constipation is related to longer permanence under mechanical ventilation and to longer hospitalizations. The risks for bronchoaspiration, ventilator-associated pneumonia and intolerance to enteral nutrition are greater (FEITOSA; COELHO, 2018). Despite being a complication that is commonly identified in severe patients, constipation is not a frequent topic in intensive care journals. In this sense, in order to provide better understanding and redirection of the

care practices, this study aims at evaluating the incidence and factors associated with constipation in critically-ill patients.

MATERIALS AND METHOD

This study is an integrative literature review, intended to summarize the results of a clinical study on the occurrence, definitions, associated factors and complications of constipation in critically-ill patients. The search was conducted in the following databases *Biblioteca Virtual de Saúde* (BVS): LILACS (*Literatura Latino Americana e do Caribe em Ciências da Saúde*), SciELO (Scientific Electronic Library Online) and in the PUBMED (Medical Published – service of the U.S. National Library of Medicine) international database. The selection criteria were as follows: articles in Portuguese, English and Spanish with their abstracts available in the aforementioned databases. The following descriptors were adopted to find the articles: *Constipação intestinal* (Constipation; *Estreñimiento*); *Cuidados críticos* (Critical Care; *Cuidados Críticos*); *Terapia Intensiva* (Intensive Care; *Cuidados Intensivos*). The initial result of the integrative review was the identification of 108 potentially eligible articles, with 46 remaining after screening. Of these, 19 were repeated, leaving a total of 27 articles. After reading the entire articles and rechecking their affinity with the study objective, seven publications were included in the integrative review. The articles were published between 2016 and 2020.

RESULTS AND DISCUSSION

After careful reading of the articles in the databases indexed in the aforementioned data banks between 2016 and 2020, observing the period of publication, the articles were selected by verifying their adequacy to the inclusion criteria, with catalog listing of the bibliographic material being carried out. Six studies were included in this review and, after the literature selection process, they were evaluated according to the objective of the paper and study design, with exclusion of the articles that did not have constipation in intensive care units as their main focus. The results associated with the related articles in the literature contribute to a reflection on the prevalence of constipation in intensive care unit patients and its impact on the progression of critical illness. Of these six articles, one describes the risk factors for constipation and their association with the outcomes in critically-ill patients, one deals with the importance of defining the time and duration of constipation in critically-ill patients, three are about the incidence, associated factors and the importance of the definition criteria, one is about the influence of daily laxative therapy in preventing organ dysfunction in mechanically ventilated patients, and one compares the efficacy of two medications: bisacodyl and senalin. Table 1 summarizes these papers. In a prospective cohort of critically-ill adults conducted in 2018 in an Intensive Care Unit of a high-complexity hospital, Batassini and Beghetto identified that, of the 157 patients in the study, 75.8% had constipation. With these same characteristics, Martín et al. (2014) showed an 84.06% incidence of constipation in the study participants. Fukuda et al. (2016), investigating the risk factors for constipation and their association with the outcomes of ICU patients in 2011, selected the patients into two groups: early defecation group (less than 6 days) and late defecation group (greater than or equal to 6 days). Changes in the clinical variables between admission and day 7 in the ICU were evaluated to investigate the effects of late defecation. The clinical outcomes were mortality in the ICU, permanence time in the ICU and ventilation time. The mortality rate did not present a significant difference between both groups. The length of ICU stay was significantly longer in the late defecation group than in the early defecation group, which corroborates with the studies by Gacouin et al. (2010), where constipation was associated with longer hospitalization time ($p < 0.01$) and with the study by Mostafa et al. (2003), where the mean permanence time in the ICU was higher in constipated patients (10 versus 6.5 days). Mechanical ventilation time was not significantly different between the two groups, although it tended to be longer in the late defecation group. Studies by Costa, Vulcano, Polla et al. (2013) showed that the patients had an MV time twice as long as those without constipation.

In the linear regression analysis for MV time prediction, constipation was predictive of longer MV time, even after adjusting for gender and severity ($p = 0.043$). Also according to Fukuda et al. (2016), sedatives and fentanyl were administered in more patients in the late defecation group than in the early defecation group. Among the patients on mechanical ventilation, sedatives were given to 83% of the patients in the early defecation group, while in the late defecation group, sedatives were administered to 95% of the patients. Surgical procedures were performed on more patients in the late defecation group than in the early defecation group. The proportion of patients who initiated late enteral nutrition (greater than or equal to two days) was significantly lower in the early defecation group than in the late defecation group. Thus, the study revealed that late enteral nutrition, use of sedatives and surgery were independent risk factors for late defecation. Prat et al. (2016), in order to define the incidence and impact of constipation in critically-ill patients, divided the constipated patients into two subgroups: no stool passage for more than 3 days but less than 6 days (3-day subgroup) and no stool passage for 6 days or more (6-day subgroup). It was noticed that 51.9% of the 189 patients who entered the study presented constipation: 53 in the 3-day group and 45 in the 6-day group. In this study, it was also deduced that constipated patients were more likely to use mechanical ventilation, enteral nutrition, vasopressors and sedation. Both subgroups of constipated patients presented the same probability when compared to those not constipated. The patients in the 6-day subgroup were more likely to receive vasopressor when compared to those not constipated. The patients in the 6-day group were more likely to have at least one episode of ventilator-associated pneumonia (VAP). A higher number of patients who presented constipation evolved to death. There was no difference in relation to survival between the 3-day subgroup and the patients who were not constipated. The patients in the 6-day subgroup obtained worse results when compared to the patients who were not constipated. Thus, in that study from 2016, Prat et al. concluded that at least 6 days at the first stool passage after ICU admission was mandatory to define constipation.

Due to the lack of a specific definition for constipation in critically-ill patients, the *American Gastroenterological Association*, in its guidelines, defines constipation as frequency of stool elimination below 3 times per week, a sensation of incomplete rectal emptying, hardened stool, straining to eliminate stool, and need of touch for rectal emptying. These criteria, known as the Rome criteria, are impractical and, consequently, not very applicable to critically-ill patients (Locke; Pemberton, 2000). Prat et al. developed a new study in 2018, corroborating that the constipation time and duration are important criteria for the critically-ill patient. The patients were again divided into three subgroups: not constipated, constipated at 3 to 5 days (early), and constipated at least 6 days (late). In the study, no significant demographic differences were found between late and early constipation patients, although there is a tendency towards older age in the late subgroup. The study suggests that assessment of stool absence occurs throughout the ICU stay, not only in the first few days. Batassini (2017) developed a dissertation to assess incidence and factors associated with constipation through a prospective cohort of critically-ill adult patients. Incidence of constipation was observed, especially in the surgical patients. An important finding was that the number of days using two types of laxatives is a protective factor for constipation in critically-ill patients. He used docusate sodium, which is a fecal emollient associated with bisacodyl, a stimulant laxative that causes increased contraction of the intestinal smooth muscles. The number of days on lactulose was also noted as a protective factor against constipation. The study concludes that the number of days on medications with action on the gastrointestinal tract: docusate, bisacodyl, lactulose, and omeprazole and/or ranitidine, adjusted for the number of days to evacuate, is an independent protective factor for constipation. Also in this context, Alikiaii et al. (2019), to compare the efficacy of two medications (senalin and bisacodyl) in the treatment of constipation in intensive care unit patients, through a randomized, double-blind study with 70 ICU patients, divided the patients into two groups: those who received senalin and those who received bisacodyl for a period of three days.

Table 1. Types of studies found with the research topic

Reference	Title	Type of study
Fukuda et al., 2016	Risk factors for late defecation and its association with the outcomes of critically-ill patients: a retrospective observational study	Retrospective and observational study
Prat et al., 2018	Constipation in critical care patients: both timing and duration matter	Prospective and observational study
Prat et al., 2016	Constipation: incidence and impact in medical critical care patients: importance of the definition criterion	Prospective and observational study
Batassini, 2017	<i>Incidência e fatores associados à constipação: Coorteprospectiva de pacientes adultos críticos</i>	Cohort study, contemporaneous
Batassini, Beghetto, 2018	Constipation in a cohort prospective in adult critically-ill patients: How much occurs and why?	Prospective cohort study
Alikiaii et al., 2019	Comparing the Efficacy of Two Drugs Senalin and Bisacodyl in Treatment of Constipation in Intensive Care Units' Patients	Double-blind randomized study

Source: Direct research, 2021.

Bisacodyl has been used as a first-line laxative for many years around the world, while Senalin is a household product, and there have been no studies conducted with it to evaluate its efficacy. No significant difference was observed in the effect of the two medications on stool consistency. On the other hand, the mean excretion frequency during the 2nd day of treatment was significantly higher with bisacodyl than with senalin. However, the mean excretion frequency on the other days of the study was higher in the senalin group. Regarding the complications assessed in this study, except on day 3, they were significantly lower in the senalin group when compared to bisacodyl, although no significant differences were found between the two groups regarding constipation complications on the other days. In this regard, broader and more extensive studies are needed to confirm that senalin is an appropriate alternative for the treatment of constipation in these patients (ALIKIAII et al., 2019). In this study, it was possible to observe the importance of monitoring the intestinal function of hospitalized patients with a multidisciplinary approach to record the frequency of patients' evacuation and the need to use laxative agents, according to a standardized protocol. Studies dealing with constipation in critically-ill patients and effects on prognosis are still scarce. The published data present different definitions for constipation, which can considerably affect its incidence. Therefore, further studies are needed to elucidate the effects of intestinal constipation on the prognosis of critically-ill patients.

CONCLUSION

When associated with hospitalization or bedridden patients, constipation is commonly related to the critically-ill patient who is bedridden, suffers inflammatory processes, dehydration and electrolyte disturbance, shock, and is in use of anxiolytic and opioid medications. Although it is a common complication, constipation is a scarcely treated problem. The prevalence of constipation in critically-ill patients is quite variable. This disparity in the data is the consequence of the lack of a consensual definition and of the absence of a protocol for its prevention and treatment. By understanding the incidence, pathophysiology and consequences of constipation among critically-ill patients, it is possible to plan strategies to prevent and treat this complication. In this sense, unfortunately, the studies that assist us in understanding constipation in the ICU setting are still scarce. Therefore, it becomes necessary to devise protocols and action plans to prevent and treat this disorder in intensive care units.

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