


## PERIODONTAL CONDITION OF NEUROCRITICAL PATIENTS ADMITTED TO AN INTENSIVE CARE UNIT IN THE CITY OF RECIFE, PERNAMBUCO STATE, BRAZIL

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### ABSTRACT

Adult neurological patients represent a complex challenge for health care, especially when in critical situations. These are generally more debilitated and dependent, under adverse effects of continued medications and with essential functions related to cognition, communication and identity compromised; a fact that increases the difficulties for personal hygiene, for food and for collaboration in the use of medications, among others. This leads to an increase in debilitating conditions for the body, with negative impacts on the quality of life of them and their network of caregivers. The general objective of this study was to evaluate the periodontal condition of neurocritical adult patients. A cross-sectional, retrospective study was carried out, with the descriptive analysis of secondary data obtained from the medical records of patients admitted to the Neurological ICU of a Reference Hospital, in the city of Recife, during the years 2022 and 2023. Considering 87 patients over 18 years of age who were hospitalized in the ICU in question, most were male (66.7%), with a mean age of  $40 \pm 3.7$  years, with a length of stay in the ICU of up to three days (56.3%). Some variables proposed in this investigation could not be surveyed, due to the lack of information in the dental history record adopted by the health establishment in question. Patients admitted to the neurological ICU receive oral hygiene with brushes and toothpaste, using 2.0% chlorhexidine gel, twice a day, when intubated. Regarding periodontal conditions, all had some type of periodontal disease. These, in descending order: periodontitis, with the presence of calculus or gingival tartar (49.4%), dental abscess, with suppuration (40.2%) and gingival bleeding (40.2%), tooth mobility (36.8) and biofilm (26.4%). Local dental procedures were related to scaling, drainage of abscesses and tooth extractions, when recommended, due to a risk situation.

**Keywords:** Adult health, Neurological disorder, Periodontal diseases, Intensive care units.

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## INTRODUCTION

It is estimated that neurological diseases affect one billion people in the world and are the cause of one in ten deaths. In Brazil, they are responsible for approximately 14% of clinical admissions to intensive care units, 9% of elective neurosurgeries, and 14% of emergency surgeries. Many of these conditions are incurable, imply reduced life expectancy and quality of life and greater dependence, in addition to being associated with symptoms that predispose to suffering; which justifies the integration of palliative care into the usual ones. In addition, factors peculiar to acute neurological injuries, such as catastrophic clinical presentation, complex and uncertain prognosis, communication difficulties, and issues related to quality of life, require a specific approach, recently called "neuropalliative care"<sup>1,2</sup>.

In the case of a Neurological or Neurology Intensive Care Unit (ICU), there is a need for vigilant assistance to rigorously assess vital signs, as the clientele affected by brain disorders is vulnerable to acquiring sequelae that can negatively change their entire lives. The ICU for neurologically critical patients should be equipped and directed to the special demands of these individuals, such as carrying out specific complementary exams such as Electroencephalogram (EEG) and cerebrospinal fluid (CSF) collection. In this service, the most common pathologies are: Cerebrovascular Accident (CVA), seizure disorders, and Transient Ischemic Attack<sup>3</sup>.

As a consequence of hospitalization and maneuvers performed in the ICU, hospitalized patients may present alterations in the immune system, respiratory compromise, difficulty sleeping, inability to ingest and hydrate, and are more vulnerable to developing oral and nosocomial infections<sup>4,5,6,7,8,9</sup>.

The oral microbiota is influenced by external factors (smoking, alcoholism, antibiotic therapy or corticosteroid therapy, stay in hospital environments, nutritional status and oral hygiene) and intrinsic factors of the patient (age), due to the possibility of altering local and systemic immunity and the selection of bacterial species. Periodontal disease is considered to be the result of an interactive process between biofilm and periodontal tissues through cellular and vascular responses. Its onset and progression involve a set of immunopathological and inflammatory events, with the participation of local, systemic, environmental, and genetic modifying factors. Despite the long way that research has to go, this new understanding of periodontics allows the integration of periodontal disease into the list of causes related to diseases capable of leading to the patient's death <sup>10,11,12</sup>.

The development of this research is justified by the scarcity of evidence on the participation of hospital dentistry in the care of hospitalized patients, especially those with

greater vulnerability. This research aims to evaluate the periodontal condition of neurocritical adult patients, as well as to identify whether they have received adequate care in this context.

## METHODOLOGY

This was a retrospective study with data collected from the medical records (secondary data) of critically ill neurological adult patients admitted to the Neurological ICU of a philanthropic reference hospital in the city of Recife, Pernambuco State, Brazil.

All medical records for the years 2022 and 2023 (census sampling) were considered and the following variables related to the established objectives were recorded. From 2022 onwards, Dentistry was included in the multidisciplinary care team in the neurological ICU of the aforementioned Hospital (one of the researchers linked to this project).

Inclusion criteria: neurological patient records from 18 to 59 years of age, for the period considered in the research and with records of hospitalization for more than 24 hours.

Exclusion criteria: patients who were transferred from another ICU. The information was recorded after the submission and approval of the research project by the Research Ethics Committee of the Federal University of Pernambuco, under CAAE number 82616924.5.0000.5208.

The study was conducted in accordance with the principles that govern Resolution 466/2012 of the National Health Council of Brazil. The Confidentiality Agreement and the Declaration of Consent were signed with authorization for the use of data. These will be stored on the personal computer of the researcher in charge, for a period of five years.

Initially, the possibility of analytical statistical treatment of the data was considered, adopting a margin of error of 5.0% for the statistical tests, with the aid of the Statistical Package for the Social Sciences (SPSS) software, in its version 23. However, the following results represent the descriptive part, because, due to gaps and a wide variety in the diagnosis and comorbidities presented, there was no possibility of applying a test that could represent a significant association.

## RESULTS AND DISCUSSION

Between 2022 and 2023 and considering the inclusion and exclusion criteria adopted, the sample comprised 87 patients over 18 years of age who were hospitalized in the ICU in question for a period of up to three days (56.3%). the majority were male (Graph 1), with a mean age of  $40 \pm 3.7$  years. Some variables proposed in this investigation could

not be surveyed, due to the lack of information in the dental history record adopted by the health establishment in question. Graph 2 shows the length of stay in the ICU, according to the records obtained.

Comparing the above data with the study by Perão et al 13, some findings were similar, such as the most frequent gender among the patients and the length of stay in the ICU. Regarding the age group, these authors mentioned a higher age group among hospitalized neurological patients, particularly between 50 and 59 years old.

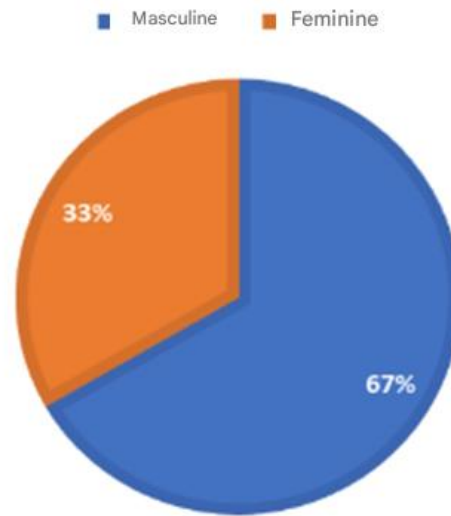
Natalin et al.14 described the most common injuries, the length of stay in the ICU, and the necessary treatments for neurological adults. Regarding the classification of the injury, 57.58% were severe traumas and 66.67% received surgical treatment. The mean length of stay in the ICU was more than 7 days (42.4%). Regarding the clinical evolution, 42.42% required a catheter to monitor intracranial pressure, 63.64% underwent invasive mechanical ventilation and 78.79% used vasoactive drugs, the most used being Norepinephrine in 67.65% of the cases, followed by Sodium Nitroprusside (Nipride®) in 17.65% and Vasopressin in 14.70%, associated with Norepinephrine. Complications occurred in 54.5% of the patients, with pneumonia being the most frequent with 47.83%.

Patients admitted to the neurological ICU receive oral hygiene with brushes and toothpaste, using chlorhexidine at 2.0% gel, twice a day, when intubated. Regarding periodontal conditions, all had some type of periodontal disease (Table), especially periodontitis with the presence of calculus or supragingival tartar (49.4%), dental abscess, with suppuration (40.2%) and gingival bleeding (40.2%), tooth mobility (36.8) and biofilm (26.4%). Local dental procedures were related to scaling, drainage of abscesses and tooth extractions, when recommended, due to a risk situation.

The results obtained are similar to those of Oliveira et al 15 where dental calculus was the most frequent oral alteration in the patients evaluated, observed in a higher number in patients with neurological and respiratory diseases. The authors in question, however, commented on other BS problems, which were not raised in the present study, but which may be related to the items included in the dental evolution form, in which the following are not scored: dental fracture, injury or infection, and lip or oral dryness.

For the Reference Hospital in question, the rights to comprehensive adult care, particularly in groups with greater vulnerability, have a positive signal, especially regarding the diagnosis and treatment of periodontal alterations.

Graph 1. Distribution of records collected, according to the gender of neurological patients admitted to the ICU



Graph 2. Length of stay in the ICU of critical neurological patients, according to the records obtained

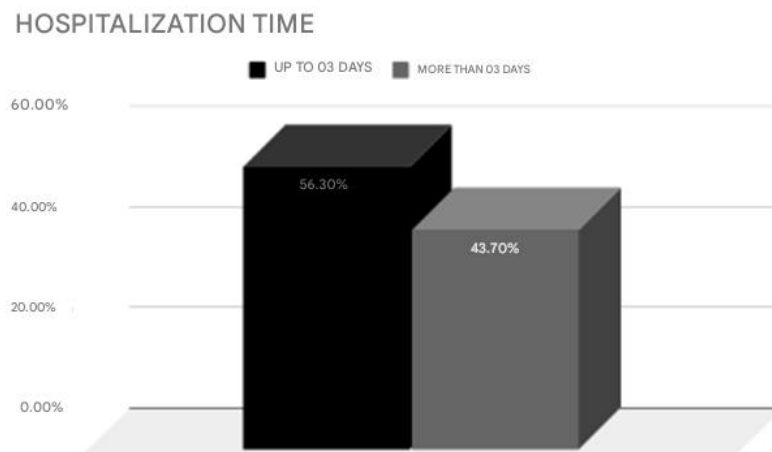


Table - Distribution of periodontal changes, according to the records of hospitalized neurological patients. Recife, 2024

Periodontal changes	n	% <sup>*</sup>
<b>TOTAL*</b>	<b>87</b>	100.0
With DP	<b>87</b>	100.0
Type of DP		
Periodontitis	<b>43</b>	49.4
Dental abscess with suppuration	<b>35</b>	40.2
Gum bleeding	<b>35</b>	40.2
Tooth mobility	<b>32</b>	36.8
Dental biofilm	<b>23</b>	26.4

\* There could be more than one type of Periodontal Disease in the same patient.

Source: Prepared by the author

## CONCLUSIONS

According to the records obtained, all adult patients admitted to the neurological ICU for the period in question had periodontal diseases, the main problems being periodontitis with the presence of supragingival calculus or tartar, dental abscess with suppuration and bleeding, tooth mobility and the presence of biofilm. Thus, risk factors for infections, especially in intubated patients.

Local dental procedures were related to scaling, drainage of abscesses and tooth extractions, when recommended, due to a risk situation.

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