

CLINICAL AND EPIDEMIOLOGICAL PROFILE OF INTUBATED PATIENTS UNDER MECHANICAL VENTILATION IN A MEDIUM COMPLEXITY HOSPITAL IN SOUTH MARANHÃO**PERFIL CLÍNICO-EPIDEMIOLÓGICO DE PACIENTES INTUBADOS E TÉCNICAS DE INTUBAÇÃO EM UM HOSPITAL DE MÉDIA COMPLEXIDADE****PERFIL CLÍNICO Y EPIDEMIOLÓGICO DE PACIENTES INTUBADOS BAJO VENTILACIÓN MECÁNICA EN UN HOSPITAL DE MEDIA COMPLEJIDAD DEL SUR DE MARANHÃO**¹Gabriel Macedo de Moraes²Guilherme Allef Matos de Moraes³Solon Alves da Silva Filho⁴Rafael Aires Oliveira Campos⁵Marcos Vinícius Novais Alves⁶Karla Vanessa Moraes Lima⁷Bruna Pereira Carvalho Siqueira⁸Francisco Alves Lima Junior¹Universidade Ceuma, Imperatriz, Brazil. Orcid: 0009-0007-3942-7086²Universidade Ceuma, Imperatriz, Brazil. Orcid: 0000-0001-9844-6227³Universidade Ceuma, Imperatriz, Brazil. Orcid: 0009-0008-1463-5599⁴Universidade Ceuma, Imperatriz, Brazil. Orcid: 0009-0000-9415-7217⁵Unisulma, Imperatriz, Brasil. Orcid: 0009-0009-5182-8995⁶Faculdade de Medicina de Açailândia, Açailândia, Brazil. Orcid: 0000-0002-3018-2621⁷Universidade Federal do Maranhão, Imperatriz, Brazil. Orcid: 0000-0002-6434-8546⁸Universidade Ceuma, Imperatriz, Brazil. Orcid: 0000-0002-3117-4949**Corresponding Author****Francisco Alves Lima Júnior**Avenida Pedro Neiva de Santana,
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francisco.alj@ufma.br**Submission:** 05-08-2026**Approval:** 07-11-2025**ABSTRACT**

Objective: To identify the clinical-epidemiological profile of patients admitted to an intensive care unit undergoing orotracheal intubation. **Methods:** Documentary, descriptive, retrospective, and quantitative study. Data collected from the medical records of intubated patients in the ICU from January to July 2023. Frequency tests were conducted for descriptive analysis. Population: 111. Approved by the Research Ethics Committee (CEP) under number: 42251020.0.0000.5084. **Results:** The most affected population consisted of men, aged 40 to 59 years, and individuals of mixed race. In the clinical and epidemiological profile, the main cause was a decreased level of consciousness (25.6%), and the rapid sequence technique was used in 80.7% of cases, with hypertension (43.1%) being the prevalent comorbidity. Patients were intubated for 0-5 days (51.4%). Medications used included hypnotics, neuromuscular blockers, and analgesics. 79.8% of patients progressed to death. **Conclusion:** There is a need for adequate control of comorbidities and professional training to reduce mortality rates and ensure proper medical record documentation.

Keywords: Rapid Sequence Induction and Intubation; Intensive Care Units; Critical Care Outcomes.

RESUMO

Objetivo: Identificar o perfil clínico-epidemiológico de pacientes internados em unidade de terapia intensiva submetidos à intubação orotraqueal. **Métodos:** Documental, descritivo, retrospectivo e quantitativo. Dados coletados nos prontuários dos pacientes intubados e sob ventilação mecânica na UTI de janeiro a julho de 2023. Realizados testes de frequência para análise descritiva. A população foi composta por 111 pacientes. Aprovado no CEP nº: 42251020.0.0000.5084. **Resultados:** A população mais acometida foi do sexo masculino, faixa etária de 40 a 59 anos e pardos. No perfil clínico e epidemiológico, a principal causa foi rebaixamento de nível de consciência (25,6%), sendo a técnica de sequência rápida de intubação (80,7%) mais utilizada, comorbidade prevalente Hipertensão arterial sistêmica (HAS) (43,1%). Os pacientes permaneceram intubados de 0-5 dias (51,4%). Medicamentos utilizados: hipnóticos, Bloqueadores neuromusculares (BNM) e analgésicos. 79,8% evoluíram para óbito. **Conclusão:** Há necessidade de realizar um controle adequado das comorbidades e capacitação dos profissionais para redução de mortalidade e adequado registro dos prontuários.

Palavras-chave: Indução e Intubação de Sequência; Unidades de Terapia Intensiva; Resultados de Cuidados Críticos.

RESUMÉN

Objetivo: Identificar el perfil clínico-epidemiológico de los pacientes ingresados en una unidad de cuidados intensivos sometidos a intubación orotraqueal. **Métodos:** Estudio documental, descriptivo, retrospectivo y cuantitativo. Datos recopilados de las historias clínicas de los pacientes intubados en la UCI desde enero hasta julio de 2023. Se realizaron pruebas de frecuencia para el análisis descriptivo. **Población:** 111. Aprobado por el Comité de Ética en Investigación (CEP) con el número: 42251020.0.0000.5084. **Resultados:** La población más afectada fueron hombres, con edades comprendidas entre los 40 y 59 años, y personas de raza mestiza. En el perfil clínico y epidemiológico, la principal causa fue el descenso del nivel de conciencia (25,6%), y se utilizó la técnica de secuencia rápida en el 80,7% de los casos, siendo la hipertensión arterial (43,1%) la comorbilidad prevalente. Los pacientes estuvieron intubados de 0 a 5 días (51,4%). Se utilizaron medicamentos como hipnóticos, bloqueadores neuromusculares y analgésicos. El 79,8% de los pacientes evolucionaron hacia el fallecimiento. **Conclusión:** Existe la necesidad de un control adecuado de las comorbilidades y de la formación profesional para reducir las tasas de mortalidad y garantizar un registro adecuado de las historias clínicas.

Palabras clave: Intubación e Inducción de Secuencia Rápida; Unidades de Cuidados Intensivos; Resultados de Cuidados Críticos.

INTRODUCTION

In critically ill patients, orotracheal intubation (OTI) is considered a key procedure due to its life-saving potential, stemming from its ability to definitively protect and maintain the airway. Its main indications are patients with: inability to protect the airway (Glasgow ≤ 8), failure of ventilation and/or oxygenation¹.

There are risks and complications associated with OTI, which can be avoided if the procedure is performed using the correct technique, based on rapid-sequence or extended-sequence protocols. Possible complications include esophageal intubation, which can lead to hypoxemia, hypercapnia, and death; selective intubation, resulting in atelectasis of the non-ventilated lung or barotrauma; trauma to the upper airway, cervical spine, or teeth; cardiac arrhythmias; among others^{1,2}.

Based on an understanding of the main airway complications and the pathophysiology of mucosal injuries related to orotracheal intubation, simple and practical prophylactic measures can be adopted during the care of intubated patients, which reliably ensure a reduction in the rate of airway morbidity².

Based on the epidemiological survey of orotracheal intubation (OTI), the four main indications for this procedure were identified as follows: cardiopulmonary arrest (CPA), impaired level of consciousness (Glasgow ≤ 8), acute respiratory failure (ARF), and cardiovascular diseases. In addition, a higher prevalence of

intubation was observed among males and in the age group over sixty years³.

Thus, given that the epidemiology of intubation has demonstrated the importance of this procedure for patient survival, particularly among critically ill patients, interest arose in conducting a study from this perspective, not only to demonstrate the correct intubation technique for the professional development of healthcare providers but also to reduce errors during and after the procedure, thereby lowering morbidity and improving the quality of life for patients undergoing orotracheal intubation (OTI).

Thus, the objective of this study is to identify the clinical and epidemiological profile of patients admitted to an intensive care unit who underwent orotracheal intubation at a hospital in the southern part of the state of Maranhão.

METHODS

This is a documentary, descriptive, retrospective study with a quantitative approach. The study utilized secondary data from physical medical records of patients intubated in the Intensive Care Unit (ICU) from January to July 2023 at a referral hospital in southern Maranhão State.

Frequency tests were performed for descriptive analysis of the data. The study population consisted of 350 medical records; after applying the inclusion criteria, 111 were included, representing all patients who underwent OTI during the period. The study

included patients over 18 years of age who underwent orotracheal intubation (OTI) and were hospitalized during the first half of 2023. This project was submitted to and approved by the Research Ethics Committee (CEP) under No. 42251020.0.0000.5084.

RESULTS

Based on the data obtained, it was found that 111 OTI procedures occurred in the first half of 2023, including all patients who underwent OTI and were over 18 years of age, with two patients excluded because they were under 18 years of age, resulting in a total of N=109 patients.

Table 1 - Sociodemographic characteristics of patients admitted to and undergoing IOT at a hospital in southern Maranhão from January through July 2023.

	FA (N)	FR (%)
Age group		
20 to 39 years	6	5.5
40 to 59 years old	33	30.2
60 to 64 years old	5	4.5
65 or older	65	59.8
Gender		
Male	58	53.0
Female	51	47.0
Race/Ethnicity		
Not Specified	4	3.6
White	16	14.6
Black	11	11.0
Brown	77	70.6
Indigenous	01	0.2
	109	100%

AF: Absolute frequency; RF: Relative frequency

Table 2 - Clinical characteristics of patients admitted and undergoing IOT at a hospital in southern Maranhão from January through July 2023.

	AF (N)	RF (%)
Reasons for IOT		
Acute Respiratory Distress Syndrome (ARDS)	8	7.3
Acute Respiratory Failure (ARF)	20	18.3
Cardiac Arrest (CA)	15	13.7
Impaired Level of Consciousness (ILOC)	28	25.6
Pulmonary-Focused Sepsis (PFS)	21	19.2
Abdominal-Origin Sepsis (AOS)	10	9.8
Not Recorded (NR)	1	1.0
Upper Gastrointestinal Bleeding (HDA)	2	2.0
Acute Pulmonary Edema (APE)	4	4.0

Technique used		
Rapid sequence	88	80.7
Slow sequence	03	2.7
Not recorded	17	16.6
Pipe size		
7	5	4.5
7.5	12	11.3
8	15	13.7
8.5	09	8.2
Others	5	4.5
Not recorded	63	57.8
Comorbidities		
Systemic Arterial Hypertension (SAH)	47	43.1
Type 2 Diabetes Mellitus (T2DM)	25	22.9
Obesity	01	1.0
Asthma or Chronic Obstructive Pulmonary Disease (COPD)	11	10.0
Others	13	12.0
Not recorded	12	11.0
Day in the ICU		
0–5	25	23
6–10	20	18.3
11–15	19	17.4
16–20	20	18.3
Over 20	25	23
Day of intubation		
0–5	56	51.4
6–10	29	26.6
11–14	12	11
Over 14 (prolonged)	12	11
	109	100%

AF: Absolute frequency; RF: Relative frequency

Table 3 - Medications used in patients undergoing the IOT procedure at a hospital in southern Maranhão from January through July 2023.

Medication		AF (N)	RF (%)
<i>Hypnotics</i>	Etomidate	18	16.6
	Ketamine	15	13.7
	Midazolam	28	25.6
	Propofol	02	2.0
	Not used	10	9.1
	Not recorded	36	33
<i>Neuromuscular Blocker (NMB)</i>	Succinylcholine	24	23
	Rocuronium	10	9.1
	Not used	33	30.2

	Not recorded	41	37.7
	Fentanyl	58	53.5
Analgesia	Lidocaine	01	1.0
	Not used	05	4.5
	Not recorded	44	41
		109	100%

AF: Absolute frequency; RF: Relative frequency

Table 4 - Clinical outcomes related to IOT in patients who underwent IOT at a hospital in southern Maranhão from January through July 2023.

Post-IOT Complication	AF (N)	RF (%)
Death	08	7.5
Pneumothorax	00	0
Airway injury	00	0
None	88	81.5
Other	07	6.5
Not recorded	05	4.5
Clinical outcome		
Not extubated, transferred	01	1
Extubated alive	21	19.2
Death	87	79.8
	111	100%

AF: Absolute frequency; RF: Relative frequency

DISCUSSION

From January through July 2023, a total of 111 patients underwent IOT in the ICU, with the most affected age group being the elderly (≥ 65 years), resulting in 65 patients (59.8%) undergoing IOT, a finding consistent with the results of a study conducted in Macéio in 2022, which reported that the mean age of patients undergoing IOT was 67 years. The most common comorbidities observed in the study were systemic arterial hypertension (43.1%) and type 2 diabetes mellitus (22.9%), which affect this population and contribute to the need for IOT^{4,5,6,7}.

Males were the most affected group, accounting for 53% of cases. A study conducted

in Maceió corroborates this finding, identifying that 62% of participants had this condition; this is attributed to men having a higher level of impairment in their organ systems due to their professional obligations, neglect, and certain anatomical and physiological variations when compared to women^{6,7}.

Regarding race/skin color, the most affected group was those of mixed-race descent (70.6%); however, the literature shows discrepancies on this point, which may be related to the demographic characteristics of each region studied⁸.

From a clinical/epidemiological perspective, regarding the main indications for IOT, the following were identified: altered level

of consciousness (25.6%), pulmonary sepsis (19.2%), and acute respiratory failure (18.3%). A study by Frazão et al. (2020) corroborates the data described above, showing that the main indications were altered level of consciousness (55%), acute respiratory failure (43%), and cardiopulmonary arrest (2%)^{2,4,6,8}.

Regarding the intubation technique, rapid sequence intubation (RSI) was predominant (80.7%). However, a failure to properly identify the technique used was observed during the analysis of the results, given that the majority (37.5%) of the intubations considered by physicians to be SR were not, in fact, SR, since this technique requires the mandatory use of neuromuscular blockers (NMBs), according to the Walls Manual for Emergency Airway Management^{9,10}.

Based on a review of medical records of patients who underwent IOT, a high prevalence was noted in the use of hypnotics (midazolam 25.6%; etomidate 16.6%), neuromuscular blockers (succinylcholine 23%; rocuronium 9.1%), and analgesics (fentanyl 53.5%; lidocaine 1%). However, analysis of the medical records revealed that in most cases, the medications used during the procedure were not recorded (hypnotics not recorded 33%, NMBs not recorded 37.7%, and analgesics not recorded 41%). Therefore, it is imperative to train professionals regarding the documentation in medical records of all steps in the rapid sequence intubation procedure^{1,9,11,12,17}.

Regarding the number of days patients remained on mechanical ventilation, the most

common duration was 0 to 5 days (51.4%) among all patients who underwent the procedure. Regarding the length of ICU stay, a homogeneous distribution was observed across the extremes, with a prevalence of stays ranging from 0 to 5 days (23%) and over 20 days (23%). Given the correlation between length of hospital stay and intubation duration, it was concluded that patients who remained hospitalized or intubated for longer periods had worse outcomes, which also reflected the patients' underlying conditions, since patients with more pre-existing conditions prior to IOT remained in the ICU for longer periods^{14,11}.

Regarding clinical outcomes, the study shows that 79.8% of patients died, 19.2% were extubated alive, and 1% of the sample remained intubated or were transferred. It can be inferred that the population most vulnerable to death was the elderly, accounting for 59.8% of the cases. A study conducted in Natal, Rio Grande do Norte, presents similar data, confirming that elderly patients with comorbidities admitted to the ICU have lower survival rates¹³.

CONCLUSION

The sociodemographic profile of intubated patients showed a predominance of men, the elderly (aged 65 years or older), and people of mixed race.

Regarding the clinical and epidemiological profile, the main cause was found to be impaired level of consciousness (25.6%); the technique used was rapid sequence intubation (80.7%); and the most prevalent

comorbidity was hypertension (43.1%), followed by type 2 diabetes (22.9%). Patients remained intubated for 0–5 days (51.4%). Among the medications administered were hypnotics, neuromuscular blockers (NMBs), and analgesics. The most commonly used were midazolam (25.6%), succinylcholine (23%), and fentanyl (53.5%). Regarding clinical outcome, 79.8% of the patients died.

Thus, it is evident that there is a need for adequate management of the comorbidities affecting patients in order to reduce mortality among patients undergoing IOT. Furthermore, it is essential that healthcare professionals be trained to document medical records properly, which will allow for a more thorough analysis of the procedure performed and the technique used.

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All authors contributed substantially to the conception and/or planning of the study; to the acquisition, analysis, and/or interpretation of data; as well as to the drafting and/or critical revision and final approval of the published version.

Scientific Editor: Francisco Mayron Morais Soares. ORCID: <https://orcid.org/0000-0001-7316-2519>

Funding and Acknowledgments:

“None to declare”

Conflict of interest statement

“None to declare”

Data availability statement

No datasets were generated in this study. The information presented is described in the body of the article.

Authorship criteria (author contributions)