Revista Chilena de Fonoaudiología 22(1), 1-11
https://revfono.uchile.cl/
ISSN 0719-4692

Original Article

A Review of Clinical Protocols for Cuff Management in Adult Patients with an Artificial Airway in Chilean Hospitals

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ABSTRACT

Previous research carried out in Chile reports that some health institutions have developed their own protocols for the management of adult patients with an artificial airway. These protocols recommend different cuff pressures, which could result in risks for the patients. There is no guideline by the Chilean Ministry of Health on this topic; furthermore, it has been observed that health professionals in Chile use inadequate cuff pressures with patients. The objective of this study was to describe the techniques and cuff pressures recommended in the protocols of Chilean public hospitals for the management of adult patients with an artificial airway. Secondary research was conducted using a descriptive design that included valid protocols used for the management of adult patients with an artificial airway in Chilean public hospitals. The project was approved by an Ethics Research Committee. The results of this study showed that most of the protocols mentioned the use of an objective technique with patients; however, they failed to mention the specific instrument. The mean minimum pressure reported in the protocols was 28.44 cmH2O, whilst the mean maximum pressure was 36.12 cmH2O. Only 23.80% of the protocols complied with the pressure values recommended by the current evidence. In conclusion, most of the analyzed protocols mention the use of an objective technique, with 68.75% of them recommending cuff pressures that exceed safe values. This could compromise the adequate care of patients during hospitalization. It is crucial that institutional protocols are updated and that the Ministry of Health develops a national guideline that provides clear instructions on this practice.

Keywords:
Airway management; Tracheostomy; Intratracheal; Quality Assurance in Health Care; Chile

Revisión de protocolos clínicos para el manejo del cuff en pacientes adultos con vía aérea artificial en hospitales públicos chilenos

RESUMEN

En Chile no existe una guía clara del Ministerio de Salud al respecto el manejo de las presiones del cuff en pacientes adultos con vía aérea artificial. En este contexto, diversas instituciones de salud, tanto públicas como privadas, han desarrollado sus propios protocolos para el manejo de pacientes adultos con vía aérea artificial. Estos protocolos presentan variaciones en las presiones del cuff utilizadas, lo que puede generar riesgos para los pacientes. Más aun, se ha observado que los profesionales de la salud aplican presiones peligrosas en el manejo de estos pacientes. El objetivo de este estudio fue describir las técnicas y las presiones utilizadas en los protocolos de instituciones hospitalarias de salud pública en Chile para el manejo de la presión del cuff en pacientes adultos con vía aérea artificial. Para ello, se llevó a cabo una revisión de protocolos vigentes de estas instituciones. Los resultados muestran que la mayoría de los protocolos mencionan el uso de una técnica objetiva, aunque no especifican necesariamente el instrumento a utilizar. La presión mínima promedio en los protocolos revisados es de 28,44 cmH_2O, mientras que la presión máxima promedio es de 36,12 cmH_2O. Solo el 23,80% de los protocolos cumplen con los valores recomendados actualizados. En conclusión, la mayoría de los protocolos mencionados utilizan una técnica objetiva. De ellos, el 68,75% sugieren presiones del cuff por sobre los valores seguros, lo que podría afectar la atención de los pacientes durante su hospitalización. Se requiere una actualización de los protocolos y la elaboración de directrices ministeriales claras al respecto.

Palabras clave:
Manejo de Vía Aérea; Traqueostomía; Intubación Endotraqueal; Garantía de la Calidad de Atención de Salud; Chile

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Received: 12-27-2022
Accepted: 11-08-2023
Published: 11-23-2023

https://doi.org/10.5354/0719-4692.2023.69258

INTRODUCTION

When caring for patients who require artificial airways, it is crucial to reduce the risk of content leakage into the lower respiratory tract (LRT) by ensuring proper airway closure. To achieve this, it is essential to manage the cuff in endotracheal tubes and tracheostomy cannulae appropriately, by using safe pressure levels (Ignatavicius et al., 2018). This can be carried out using various techniques. Objective techniques measure cuff pressure and use reference values to control it. These values can be expressed in two types of unit: centimeters of water (cmH2O) and millimeters of mercury (mmHg), with the former being more commonly used (1 mmHg corresponds to 1.36 cmH2O; Wilmott et al., 2012). On the other hand, subjective techniques (minimal occlusive volume, minimal leak, predetermined volume, and digital palpation) do not yield observable values, as they do not involve cuff pressure measurements. Evidence suggests that these techniques are not entirely effective, achieving success in only about 30% of cases (Félix-Ruiz et al., 2014). Similarly, Giusti et al. (2016) report that only 32.4% of professionals accurately estimate whether cuff pressure is at appropriate levels by using digital palpation. Félix-Ruiz et al. (2014) observed a success rate of 31% in cuff pressure estimations using this technique in a group of patients. Another subjective technique studied is the minimum leak technique, which has shown varied results. Félix-Ruiz et al. (2014) indicate a success rate of 33.33% and Harvie et al. (2016) 44%, while Selman et al. (2020) report 76% success rate.

The literature indicates that using pressures below the established values increases the risk of content leakage into the LRT, thereby heightening the risk of aspiration pneumonia (Cámpora & Falduti, 2019; Ignatavicius et al., 2018). Conversely, using pressures higher than optimal levels has been reported to elevate the risk of tracheal damage (Cámpora & Falduti, 2019; Ignatavicius et al., 2018). Internationally, there are diverse recommendations in clinical guidelines and scientific articles regarding pressure values for managing cuffs of artificial airway devices in adult patients (Rosales, 2019b). These recommendations span from 12 cmH2O (Russell & Matta, 2004) to 35 cmH2O (Credland, 2015; De Leyn et al., 2007; Hess, 2005). However, these international recommendations are based on various studies, some published in the seventies and nineties, primarily utilizing animal samples such as pigs, horses, dogs, and rabbits (Rosales, 2019b). Recent reports and studies suggest that the recommended cuff pressure range should be between 20 and 30 cmH2O (Ignatavicius et al., 2018; Jadot et al., 2018; Maldonado et al., 2018; Pires de Farias, 2018; Rosales, 2019b; Vera Alarcón et al., 2020; Volsko et al., 2020). In Latin America, publicly available information on this topic from official sources is limited. Argentina is one country that provides such information, recommending maintaining cuff pressure between 25 and 30 cmH2O (Ministerio de Salud de Argentina, 2022).

In Chile, there is no clear guideline from the Ministry of Health (MINSAL) on this matter. Various presentations are available in the public documents accessible through MINSAL's online library. These presentations feature different reference values, such as those presented by Barriga (2019), who proposes a range between 25 and 30 mmHg (equivalent to 34 and 41 cmH2O according to the conversion by Wilmott et al. [2012]), and those provided by Rojas Bolvarán (2016), who suggests a range between 20 and 30 cmH2O. Additionally, in the context of the sanitary emergency caused by the COVID-19 pandemic and as part of actions carried out to prevent nosocomial respiratory infections associated with invasive devices, *Subsecretaría de Redes Asistenciales de Chile* (2020) issued circular C37 Nº008, recommending health institutions to routinely measure cuff pressure and maintain it between 20 and 30 cmH2O. This recommendation is based on clinical guidelines developed by various national and international organizations.

Based on the aforementioned information and considering the absence of guidelines in previous years, both public and private health institutions in Chile have developed internal protocols. These documents, similar to the international literature, provide diverse suggestions regarding cuff pressure for the proper management of adult patients with artificial airways. However, the development of these internal protocols by healthcare institutions, using different cuff pressure ranges, without regulation, may lead to the use of non-recommended values. Consequently, this could pose risks during patient care, both due to the introduction of content into the LRT if the cuff pressure is lower than optimal, and tracheal damage if the pressure is higher than suggested (Rosales, 2019b, 2021).

Recently, a study was conducted in Chile to investigate the management of patients with artificial airways by physiotherapists, nurses, and speech therapists, focusing on the analysis of cuff pressure handling (Rosales, 2021). The researchers utilized a questionnaire developed at the University of Southampton in the United Kingdom, which had been validated for use among healthcare professionals in Chile (Rosales, 2019a). This questionnaire includes questions regarding (1) the use of objective techniques (cuff pressure measurement; minimum pressure; maximum pressure; knowledge acquisition on these techniques; institutional protocols; measurement unit used in said protocols; and recommended pressure values), (2) use of subjective techniques (general use of subjective techniques; use

of minimal occlusive volume technique; application of minimal leak technique; use of digital palpation technique; use of predetermined volume technique; and predetermined volume used), (3) a combination of techniques (simultaneous use of techniques and primary technique), and (4) general information about the participants (years of experience, workplace, profession, highest level of education in the field, and current involvement with users with artificial airways). The findings indicate that the participating professionals in this study employ both objective and subjective techniques. It is also evident that professionals utilize cuff pressures that deviate from those suggested in their workplace protocols and current recommendations. The median for these pressure values was 25 cmH2O for the minimum and 34 cmH2O for the maximum. It is noteworthy that this discrepancy may lead to an elevated risk during care. Additionally, the study unveiled a statistically significant difference between the maximum pressure employed by the professionals and the pressure levels recommended in the institutional protocols. Given these observations, a decision was made to replicate the research, tailoring it to each profession.

For this reason, a study exclusively focusing on speech therapists was carried out in Chile. This study highlighted, once again, the risks present during the care of patients with artificial airways due to the use of cuffs that were either over-inflated or under-inflated in relation to the recommendations of recent studies (Rosales et al., 2022). Furthermore, it found statistically significant differences between the minimum pressures reported by speech therapists in high-complexity hospitals and those in private clinics. Specifically, speech therapists in the public system reported values closer to 20 cmH2O, as recommended by the latest literature. Both studies concluded that the minimum and maximum cuff pressure values used in Chile are outside the ranges recommended by the current literature, potentially posing safety concerns for adult service users with artificial airways. Finally, the authors recommend that healthcare institutions review all their protocols, and that MINSAL develops a national guideline for the management of adult patients with artificial airways (Rosales, 2021; Rosales et al., 2022).

Given the above, the following research question arises: What are the techniques and minimum and maximum pressures recommended by updated Chilean protocols from public hospitals, for the management of adult patients with artificial airways? Accordingly, the objective of this study is to describe the techniques and pressure values employed for cuff management in adult patients with artificial airways, as documented in Chilean protocols from public hospitals. To accomplish this, a descriptive review study was designed.

MATERIALS AND METHODS

Population and Sample

The population for this study exclusively comprises public hospitals in Chile that provide care to adult patients. The sample consisted of a total of 18 hospitals from the XV, II, IV, V, RM, VI, VIII, X, and XI regions in Chile, which provided information to carry out this study.

Inclusion Criteria for the Protocols

The inclusion criteria for the protocols were as follows: inclusion of protocols from public hospitals in Chile specifically addressing the management of adult patients with artificial airways, and inclusion of documents with current institutional validity approved by the Patient Safety and Quality Units of each hospital.

Exclusion Criteria for the Protocols

The exclusion criteria encompassed the following: exclusion of protocols from public hospitals in Chile related to the management of pediatric patients with artificial airways, exclusion of national protocols lacking institutional validity, and exclusion of protocols not approved by the Patient Safety and Quality Units.

Instruments

The study employed the following instruments: protocols from Chilean public hospitals addressing the management of adult patients with artificial airways and meeting the inclusion criteria, Microsoft Excel v.16 for the creation of a database to record data and offer a qualitative description of the information, the Statistical Package for the Social Sciences (SPSS) software v.24 for data analysis, and the researchers' personal computers.

Procedures

Initially, a table was generated, encompassing the following data: region (non-ordinal categorical data), district (non-ordinal categorical data), hospital name (non-ordinal categorical data), access to institutional protocols (dichotomous categorical data), protocol for the management of adult patients with artificial airway (dichotomous categorical data), name of the institutional protocol (qualitative data), date of protocol validity (continuous data), characteristics of cuff insufflation techniques (qualitative data), minimum and maximum cuff pressure values in cmH2O (discrete data), and characteristics of the references cited in the protocols (qualitative data). Subsequently, the first section of the table was populated with data from all hospitals, organized by region. Thirdly, the principal investigator, utilizing the

Transparency portal, solicited information from MINSAL regarding contacts for Heads of Patient Safety and Quality Units to obtain access to institutional protocols related to the management of adult patients with artificial airways for subsequent analysis. Fourthly, the research team completed the table with the acquired data. Finally, the gathered information underwent qualitative analysis, followed by descriptive analyses.

Data Analysis

The information was qualitatively analyzed through a comprehensive review of the content within each protocol to extract the necessary data for the report. Following this, a descriptive analysis was conducted employing measures of central tendency for numerical variables and percentages and frequencies for categorical data (Dancey et al., 2012; Hernández & Mendoza, 2018).

Ethical Considerations

This study was approved by the Scientific Ethics Committee of *Hospital San Juan de Dios* on November 25, 2021, with the assigned protocol number 106.

RESULTS

On February 21, 2022, an inquiry was submitted via the Transparency portal of the Undersecretariat of Public Health, part of the Ministry of Health (MINSAL), with the reference AO001T0016480. A total of 21 protocols from 18 hospitals were included for analysis after applying the inclusion criteria. This selection was influenced by three primary reasons: (1) incomplete access to all hospital documents; (2) the absence of institutional validity for certain protocols; and (3) the absence of protocols in specific hospitals. Table 1 summarizes the information provided by these documents. For practical purposes, the pressure values presented in Table 1 are expressed in cmH2O; pressures in mmHg were converted to cmH2O by multiplying the values by 1.36, as recommended by Wilmott et al. (2012).

Table 1. Summary of Institutional Protocols for the Management of Adult Patients with Artificial Airways in Chilean Hospitals.

Region	Hospital	Protocol Name	Year of Latest Approval	Validity	Used Techniques	Min. Pressure in cmH_2O	Max. Pressure in cmH_2O	Comments
XV	Hospital Regional Dr. Juan Noé Crevani	Manual of Nursing Procedures in Adult Patients	2021	April 2026	Objective	20**	30***	Pressures within the updated values. On one occasion, it mentions the same values in mmHg. Use of pressures only in ETT and not in OTT. This confusion could pose a risk during care. References lack a year of publication.
II	Hospital Dr. Leonardo Guzmán	Management of Tracheostomy and Orotracheal Tube	2018	March 2023	N/I*	N/I*	N/I*	No information about pressures. This could pose a risk during care. References older than 10 years, between 1997 and 2009.
	Hospital Regional de Copiapó	Procedures for Installation and Maintenance of Mechanical Ventilation	2020b	Dec. 2025	N/I*	N/I*	N/I*	No information about pressures, which could pose a risk during care. References based on a 2011 protocol from another institution.

		Procedure for the Management of Tracheostomy and Endotracheal Tube	2020a	Dec. 2025	N/I*	N/I*	N/I*	No information about pressures, which could pose a risk during care. References based on a 2011 protocol from another institution.
IV	Hospital Dr. Antonio Tirado Lanas	Protocol for the Care and Management of Patients with Endotracheal Tube	2019	May 2024	Objective	34	40	Indicates pressures between 25 and 30 mmHg. High risk of tracheal injuries during care. References based on protocols from other hospitals and manuals from between 2015 and 2018.
V	Hospital de San Camilo	Nursing Standard for the Management of Endotracheal Tube and Tracheostomy in Adult Patients	2022	April 2027	Objective	25**	30***	Pressures within the updated values. References are based on a protocol from another hospital.
	Hospital Dr. Eduardo Pereira Ramírez	Nursing Care for Patients with Endotracheal Tube	2018	June 2023	Objective	25**	35	High risk of causing tracheal injuries during care. References based on protocols developed between 2007 and 2012.
RM	Hospital San Juan de Dios	Management of Endotracheal Tube and Tracheostomy	2018	June 2023	Objective	34	40	Indicates pressures between 25 and 30 mmHg. High risk of causing tracheal injuries during care. References are based on documents developed between 1999 and 2004.
	Hospital San José de Melipilla	Rehabilitation Protocol for Hospitalized Patients with Tracheostomy, Management, and Decannulation Process	2022	Feb. 2027	Objective	25**	30***	Pressures within the updated values. References from the period between 2005 and 2020 with updated recommendations.
	Hospital Dr. Luis Tisné	Nursing Management Protocol for Adult Patients with Endotracheal Tube and/or Tracheotomy	2018	March 2023	Objective	35	40	High risk of causing tracheal injuries during care. References from the years 1993 to 2008.

	Hospital Metropolitano	Decannulation Protocol for Tracheostomized Patients	2021	July 2024	N/I*	N/I*	30***	Does not report minimum pressure, potentially posing a risk of aspiration pneumonia. Some references are over 10 years old.
	Hospital Barros Luco Trudeau	Protocol for the Safe Management of Patients with Tracheostomy	2021	July 2025	Objective	20***	30***	Pressures within the updated values. References from the years 2005 to 2020.
VI	Hospital Regional de Rancagua	Nursing Management Protocol for Patients with Tracheostomy and Endotracheal Tube at HRLBO	2017	Nov. 2022	Objective	25**	35	High risk of causing tracheal injuries during care. References from the years 2007 to 2016.
VIII	Hospital Clínico Herminda Martín	Nursing Management in Patients with Invasive Mechanical Ventilation at Hospital Clínico Herminda Martín	2020	March 2025	Objective and Subjective	25**	34	High risk of causing tracheal injuries during care. Pressures between 20 and 30 mmHg are occasionally mentioned, which can be confusing for clinicians. The majority of references are over 10 years old.
		Management of Tracheostomy and Endotracheal Tube in Adult Service Users Treated at HCHM	2019	Oct. 2023	Objective	25**	34	High risk of causing tracheal injuries during care. A mix of references from formal and informal sources.
	Hospital Las Higueras	Management of Patients with Endotracheal Tube and Tracheostomy	2017	March 2021	Objective	30	40	Pressures reported in mmHg. Additionally, there is inconsistency in the values found in the text. High risk of causing tracheal injuries during care. Outdated references.
	Hospital de Tomé	Tracheostomy Management	2019	Jan. 2024	Objective	40	48	Pressures reported in mmHg. High risk of causing tracheal injuries during care. References that are outdated and from obsolete protocols.
		Endotracheal Tube Management	2018	Sept. 2023	Objective	40	48	Pressures reported in mmHg. High risk of causing tracheal injuries during care. Old references dating back to 1993.

X	Hospital Base San José de Osorno	Protocol of nursing Management for Patients on Mechanical Ventilation	2018	Oct. 2023	Objective	27**	40	Pressures reported in mmHg. High risk of causing tracheal injuries during care. References from protocols of other institutions.
	Hospital de Puerto Montt	Nursing Procedure for Patients with Artificial Airway	2020	Dec. 2025	Objective	25**	30***	Pressures within updated values. Most references are from before the year 2008.
XI	Hospital Regional de Coyhaique	Prevention of Infections Associated with Invasive Procedures.	2018	March 2023	N/I*	N/I*	N/I*	No information about pressure values. Could pose a risk during care. References predating the year 2012, including protocols from other institutions.

*N/I: No Information.
**: Minimum cuff pressure within appropriate ranges.
***: Maximum cuff pressure within appropriate ranges.

Fifteen protocols refer to the application of objective techniques and specify pressure range values. However, they commonly omit the specification of the particular instrument used, with only a few protocols citing the cuff manometer, and to a lesser extent, the pressure manometer. Conversely, only one document acknowledges using both objective and subjective techniques in the care of patients with artificial airways, whereas five documents fail to provide specific information about this procedure.

Concerning minimum pressure, 10 out of the 21 protocols specify pressures ranging from 20 to 27 cmH2O, aligning with the currently recommended ranges. Within this subset, two protocols advocate for the use of 20 cmH2O, seven recommend 25 cmH2O, and one suggests 27 cmH2O. Conversely, one document prescribes a minimum pressure of 30 cmH2O, two indicate 34 cmH2O, one mentions 35 cmH2O, two advocate for 40 cmH2O, and five do not provide information on this aspect.

Regarding maximum pressure levels, six out of 21 protocols stipulate values of 30 cmH2O, aligning with contemporary recommendations. Two protocols mention 34 cmH2O, while another two indicate 35 cmH2O. Additionally, five documents advocate for 40 cmH2O, two specify 48 cmH2O, and four do not provide specific values.

As a general observation regarding the protocols, it was noted that eight of them consistently and/or partially expressed values in mmHg for the procedures. Additionally, it was observed that the majority of references used in their development were over 10 years old, and at times derived from documents originating from other health institutions.

A descriptive data analysis was carried out, as presented in Table 2. For the minimum pressure, only 16 protocols containing pertinent information were included. These data were parametric, exhibiting a mean of 28.44 cmH2O and a standard deviation of 6.33 cmH2O. For the maximum pressure, data from the 17 institutional documents that reported specific values were included. These data were also parametric, displaying a mean value of 36.12 cmH2O and a standard deviation of 6.09 cmH2O, as indicated in the protocols.

Table 2. Descriptive analysis of the minimum and maximum pressures, in cmH2O, indicated in the institutional protocols.

	Minimum Pressure in cmH_2O	Maximum Pressure in cmH_2O
Mean	28.44	36.12
Standard Deviation	6.33	6.09
Range	20.00	18.00
Minimum	20.00	30.00
Maximum	40.00	48.00

For minimum pressures, considering the 16 protocols that included information on this matter, 62.5% adhered to suggestions based on updated evidence, while 37.5% fell outside the recommended range. Regarding maximum pressures, taking into account the 17 documents that included specific data, 35.3% aligned with the most recently recommended values, while 64.7% did not comply. Specific details can be found in Table 3.

Finally, only five out of the 21 analyzed protocols, corresponding to 23.80%, meet the values recommended by updated literature, i.e., between 20 and 30 cmH2O. These protocols belong to the following hospitals: Hospital Regional Dr. Juan Noé Crevani, Hospital de San Camilo, Hospital Barros Luco Trudeau, Hospital San José de Melipilla, and Hospital de Puerto Montt. Of the remaining documents, five comply with minimum pressure values, one with maximum pressure values, six do not meet either minimum or maximum pressure values, and four do not provide information in this regard.

Table 3. Frequency and compliance percentage of the pressures reported in institutional protocols, according to recent evidence, within the range of 20 to 30 cmH2O.

	Frequency	Percentage (%)
Minimum Pressure	16	100.00
Complies	10	62.50
Does not Comply	6	37.50
Maximum Pressure	17	100.00
Complies	6	35.30
Does not Comply	11	64.70

DISCUSSION

This study aimed to delineate the techniques and pressures associated with cuff pressure management in adult patients with artificial airways, as outlined in Chilean protocols from public hospitals. Overall, it is evident that while the majority of institutional documents advocate for the use of objective techniques for cuff insufflation, only five of them (25%) adhere to the values recommended by recent literature to ensure the secure sealing of the airway and prevent the passage of contents into the lower respiratory tract. The recommended range is between 20 and 30 cmH2O (Ignatavicius et al., 2018; Jadot et al., 2018; Maldonado et al., 2018; Pires de Farias, 2018; Rosales, 2019b; Vera Alarcón et al., 2020; Volsko et al., 2020). This is of significant importance, as the proper use of recommended pressure values contributes to the reduction of the risk of aspiration pneumonia associated with under-inflated cuffs and tracheal damage due to over-inflated cuffs (Cámpora & Falduti, 2019; Ignatavicius et al., 2018). Furthermore, it aids in the prevention of nosocomial respiratory infections, given that ventilator-associated pneumonia represents a substantial challenge in healthcare and is a significant Healthcare-Associated Infection (HAI).

The results show that, from the 75% of reviewed protocols that do not comply with the current suggested ranges (between 20 and 30 cmH2O; Ignatavicius et al., 2018; Jadot et al., 2018; Maldonado et al., 2018; Pires de Farias, 2018; Rosales, 2019b; Vera Alarcón et al., 2020; Volsko et al., 2020), the majority fail in terms of the maximum pressure value. This discrepancy raises concerns about potential tracheal damage, ranging from diminished blood circulation due to partial blockage of blood vessels to the risk of tissue necrosis and tracheoesophageal fistula (Cámpora & Falduti, 2019; Ignatavicius et al., 2018). Such implications are highly concerning, as they pose a threat to the well-being of service users during their care.

Regarding the unit of measurement mentioned in the protocols, it is noteworthy that nearly 40% of the documents presented values in mmHg (equivalent to 1.36 cmH2O; Wilmott et al., 2012). This may cause confusion among clinicians who use a cuff manometer, which measures pressures in cmH2O. There is a potential risk that, by adhering to their institution's protocols, they might inadvertently convert mmHg to cmH2O, thereby unintentionally increasing the pressure range applied to patients. This, in turn, could elevate the previously mentioned risk. Furthermore, it is crucial to highlight that the documents suggesting the use of mmHg through objective techniques did not provide a conversion guide to cmH2O.

The observed variability among reference values for cuff pressure in this review can be attributed to four potential causes. Firstly, the use of outdated references by the developers of institutional protocols; secondly, the creation of documents based on protocols from other hospitals; thirdly, a lack of thorough review by the Quality Units of healthcare centers that endorse protocols before authorization by the corresponding authority; and finally, differences in the information available on the MINSAL platform, which includes both public documents from the Ministry and submissions from private entities (Barriga, 2019; Rojas Bolvarán, 2016; Subsecretaría de Redes Asistenciales de Chile, 2020).

It is noteworthy that the pandemic brought increased visibility to the care of patients undergoing invasive mechanical ventilation (IMV). Circular C37 N°008, issued by the Subsecretaría de Redes Asistenciales de Chile (2020), updated the alert and strengthened epidemiological surveillance due to the COVID-19 outbreak. However, it is crucial to emphasize the necessity of regularly measuring cuff pressure to prevent the leakage of pathogenic microorganisms into the lower respiratory tract (LRT) for all patients requiring invasive mechanical ventilation. This is because the connection of an adult patient to IMV through an endotracheal interface, whether orotracheal, nasotracheal, or via tracheostomy for more than one calendar day, qualifies as a criterion for considering it a permanent invasive device. According to Subsecretaría de Redes Asistenciales de Chile (2020), receiving care in a health center and being exposed to IMV represents a specific risk factor, and individuals in this situation should be included in epidemiological surveillance for continuous monitoring.

It is important to mention that it was not possible to access all institutional protocols from participating centers, which represents a limitation of this study. Additionally, some of the protocols obtained were not up-to-date or lacked institutional validity at the time of analysis. Moreover, certain centers did not possess institutional protocols, preventing insight into the techniques for cuff management in adult patients with an artificial airway. Finally, the detailed procedures for measuring cuff pressures and their daily management were not included in the analysis, which could have enriched the results of this project. It is projected that such information will be considered for future studies.

In light of the results of this study, it is suggested that the Quality Units of hospitals review their institutional protocols in depth and amend them based on up-to-date references. Additionally, it is recommended that the Ministry of Health develops a unique guideline on this topic. All of this is to ensure the correct care of adult patients with artificial airways during their hospitalization.

CONCLUSION

Most of the analyzed protocols (n=16) mention the use of objective techniques in the management of adult patients with artificial airways. However, they do not clearly specify what type of instrument should be used. Some documents mention the use of a cuff manometer, while other protocols mention a pressure manometer, to a lesser extent. Additionally, a small proportion of the examined institutional documents recommend pressure values within updated ranges (n=5). The mean minimum pressure reported in the protocols is 28.44 cmH2O, while the maximum is 36.12 cmH2O. A significant number of these documents indicate pressures outside safe values, which could potentially impact the care of service users during their hospitalization. This impact would be primarily associated with an increased risk of tracheal damage due to cuff overinflation, which could affect the hospital stay of patients alongside associated healthcare costs.

The necessity to update protocols at the national level is evident. Furthermore, it is crucial to develop guidelines from the Ministry of Health, grounded in current evidence. The inconsistency in techniques and pressure values observed among the reviewed documents highlights the absence of a unified national guideline. To address this, it is recommended that organizations and scientific societies be convened to collaborate in discussion panels.

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