Epidemiology and conduct carried out during the internment of children with respiratory disorders in a reference hospital of Recife

Epidemiologia e condutas realizadas durante o internamento das crianças com afecções respiratórias em hospital de referência do Recife”

DOI:10.34117/bjdv8n7-207

Recebimento dos originais: 23/05/2022
Aceitação para publicação: 30/06/2022

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ABSTRACT
INTRODUCTION: Airway infections correspond to more than a third of medical consultations, representing 20% of the causes of pediatric death. OBJECTIVES: To identify the length of hospital stay; Report the drugs utilized, complementary tests and interventions performed during hospitalization; describe mean ICU stay, type of discharge and incidence of death; To report the presence of factors predisposing to the occurrence of Respiratory Infections. METHODS: This was a retrospective cross-sectional, documentational study of the medical records of children between 0 and 10 years of age hospitalized with respiratory diseases at the Hospital Infantil Maria Lucinda, Recife, Pernambuco, Brazil in 2016. RESULTS: Of the 489, 182 medical records were analyzed. The mean age was 1.96 years. The frequency of hospitalizations was 6.7% for neonates, 60.89% for infants, 24.58% for preschool children and 7.82% for schoolchildren. It was more prevalent among male children (53.8%). The mean hospitalization by age group of the Neonates was 27.75 days, Infants 5.87, Pre-school children 5.57 and Schoolchildren 7,14. The major cause of hospitalization was pneumonia (48.9%). Among the patients who were discharged, the mean hospitalization was 6.95 days and those who died 14.33 days. The main antibiotics used were Ampicillin (30.8%) and Cephalosporin of the 3rd generation (18.7%). 24 cases reported use of pre-hospital antibiotics, with a mean hospitalization of 6.75 days. Hospital nebulization was performed in 74.7% of cases and corticosteroids in 59.3%. 23.1% of the cases performed some surgical procedure. The most frequent exams were Hemogram and Chest X-ray. 6% progressed to ICU and 1.6% died. Intubation was performed in 7.1%, re-intubations in 53.8% of these and high recumbency was not performed in 25.8%. CONCLUSIONS: The majority of the children evolved well, but it is important to improve the filling in of medical records, since the lack of information makes it difficult to construct the medical knowledge and to exert proper management of the patients.

Keywords: pediatrics, respiratory tract infections, internment.

RESUMO
INTRODUÇÃO: As infecções das vias aéreas correspondem a mais de um terço das consultas médicas, representando 20% das causas de morte pediátrica. OBJETIVOS: Identificar o tempo de internação; Relatar os medicamentos utilizados, testes complementares e intervenções realizadas durante a internação; descrever a permanência média na UTI, tipo de alta e incidência de óbito; Relatar a presença de fatores predisponentes para a ocorrência de Infecções Respiratórias. MÉTODO: Este foi um estudo transversal, retrospectivo e documental dos prontuários médicos de crianças entre 0 e 10 anos de idade internadas com doenças respiratórias no Hospital Infantil Maria Lucinda, Recife, Pernambuco, Brasil, em 2016. RESULTADOS: Dos 489, 182 prontuários médicos foram analisados. A média de idade foi de 1,96 anos. A freqüência de internações foi de 6,7% para recém-nascidos, 60,89% para lactentes, 24,58% para pré-escolares e 7,82% para crianças em idade escolar. Foi mais prevalente entre as crianças do sexo masculino (53,8%). A média de internação por faixa etária dos Neonatos foi de

27,75 dias, Infantes 5,87, Crianças em idade pré-escolar 5,57 e Crianças em idade escolar 7,14. A principal causa de hospitalização foi a pneumonia (48,9%). Entre os pacientes que tiveram alta, a média de internação foi de 6,95 dias e aqueles que morreram 14,33 dias. Os principais antibióticos utilizados foram Ampicilina (30,8%) e Cefalosporina de 3ª geração (18,7%). 24 casos relataram o uso de antibióticos pré-hospitalares, com uma hospitalização média de 6,75 dias. A nebulização hospitalar foi realizada em 74,7% dos casos e os corticoesteroides em 59,3%. 23,1% dos casos realizaram algum procedimento cirúrgico. Os exames mais freqüentes foram Hemograma e Raio X de tórax. 6% progrediram para a UTI e 1,6% morreram. A intubação foi realizada em 7,1%, as reintubações em 53,8% destes e a alta recumbência não foi realizada em 25,8%. CONCLUSÕES: A maioria das crianças evoluiu bem, mas é importante melhorar o preenchimento dos prontuários médicos, já que a falta de informação dificulta a construção do conhecimento médico e o exercício de uma gestão adequada dos pacientes.

Palavras-chave: pediatria, infecções do trato respiratório, internação.

1 INTRODUCTION

Respiratory tract infections are syndromes caused mainly by viruses and bacteria (PITREZ, PITREZ, 2003) which may lead to upper respiratory tract infections (URTI) or lower respiratory tract infections (LRTI) (RANGGANATHA, S. C. *et al.*, 2009; SOARES, *et al.*, 2020). They are responsible for more than a third of all medical consults, causing a great number of child hospitalizations throughout the world (BRICKS, 1988). Also, it is estimated that 4,3 millions of deaths in children under 5 years old occur yearly due to acute respiratory tract infections, representing 20% out of all causes of death in this age group (BENGUIGUI, 2002). In Brazil, children between 0 and 9 years old had Pneumonia as the leading cause of hospitalization throughout the years 2003 to 2007, and the region with the most number of cases was the central-west. The pediatric population is highly susceptible to the actions of respiratory viruses owing to the immaturity of their immune system (BEREZIN, *et al*., 2012;DURIGON, BEREZIN, 2014). The URTI are usually benign, of short duration and self limited, being mostly caused by agents present in the air, such as rhinovirus, influenza, adenovirus and human orthopneumovirus (HERENDEEN, SZILAGY, 2000). Among the most common bacterial agents are: *Haemophilus influenzae, Streptococcus pyogenes* e *Streptococcus pneumoniae*. The presentation of the URTI may be: acute rhinopharyngitis, influenza, sinusitis, pharyngitis and laryngitis. The main clinical manifestations are nasal obstruction, fever, dyspnea and stridor. As to the LRTI, such as bronchitis, bronchiolitis and most importantly, pneumonia, affect the intrathoracic organs and therefore have a greater morbidity. Their clinical manifestations are cough, fever, thoracic pain, tachypnea and mucus production

(DASARAJU, LIU, 1996). The most common etiological agents are *Bordatella* spp., *Chlamydia trachomatis* spp., Enterovirus, *Heamophilus influenzae, Klebsiella pneumoniae, Legionella pneumophila, Moraxella catarrhalis, Mycoplasma pneumoniae*, Parainfluenza, *Staphylococcus aureus, Streptococcus pneumoniae*, cytomegalovirus, influenzae, Epstein-Barr virus, rhinovirus , measles and human orthopneumovirus. We evaluated the respiratory tract infections at the time of admission, the laboratory exams, imaging and cultures. The etiological agents should be routinely used to update the epidemiological profile (HASAN, *et al.*, 2014). This, in turn, should always be compared with the antimicrobials used, in order to contribute to the rational use of antimicrobials, emphasizing the importance of an early therapy in the prognosis of the patient by applying antibiotics empirically based on the bacteria of greater prevalence in the region (PEDRO, MORCILLO, BARACAT, 2015). Considering the scarcity of culture exams at the Maria Lucinda Hospital, there were only two cases in which the bacterial agent was found. However, we did report the antimicrobials used empirically for airway infections. Among hospitalized patients, hospital pneumonia is the second most common hospital infection, presenting more frequently among surgical patients (especially abdominal surgeries), compared to clinical patients, and much more frequently among patients admitted to intensive care units (ICU). The main etiological agents are: *Pseudomonas aeruginosa*, *Staphylococcus aureus, Enterobacteriaceae*, *Haemophilus* spp., *Streptococcus* spp., *Acinetobacter* spp. Among the risk factors for nosocomial pneumonia, those favoring colonization of the aerodigestive tract, especially the oropharynx and the stomach by pathogenic bacteria, and those favoring aspiration, stand out. These factors should also be routinely screened in order to reduce the rate of hospital infections. Other less common routes of penetration of pathogenic bacteria into the lungs are inhalation of aerosols, especially through nebulization equipment, during mechanical ventilation, hematogenous dissemination of infectious foci, dissemination from an infectious focus in a contiguous region, and direct inoculation into intubated individuals (by contaminated material in the circuit, by tracheal aspiration without aseptic technique, or through contaminated manual resuscitators) (PINHEIRO, OLIVEIRA, JARDIM, 2002). Therefore, we proposed to evaluate the length of hospital stay among the children, comparing their initial charts and outcome, analyzing the discharge index, ICU admission and mortality of children aged 0 to 10 years hospitalized in a reference hospital in the city of Recife in the year 2016. The specific goals were: to identify the time of hospital stay of the patients according to the age group, to report the drugs used in the treatment of respiratory infections in the

Reference Hospital, to report the complementary examinations and interventions performed during hospitalization, to describe the mean number of children who progressed to ICU admission, as well as children who died and to assess the presence of factors predisposing to the incidence of Hospital Respiratory Infections in the Reference Hospital

2 METHODS

This is a primary retrospective cross-sectional, observational, documentational study (FONTELLES, *et al.*, 2009; HOCHMAN, *et al*., 2005), carried out by analyzing medical records of patients hospitalized, staying in the ward or ICU, with respiratory infections aged between 0 and 10 years, at the Hospital Infantil Maria Lucinda, in the city of Recife, Pernambuco, in the year 2016. Information was searched in the pediatric medical records, through the use of a protocol with a questionnaire elaborated for the purpose of this research. The present work was carried out during the period of a year. Patients included in the research had been hospitalized in the infirmary and ICU of the Hospital Infantil Maria Lucinda with diagnoses or diagnostic hypothesis of respiratory infections, aged 0 to 10 years. Patients who died with less than 03 days of hospitalization and patients older than 10 years were excluded. Also, all lost records were not examined.

Airway infections at the time of admission were defined as: acute infection (reported fever, documented temperature > 38 ° C, increased leukocyte count for age or abnormal differential value) and signs or symptoms of respiratory disease (coryza, otalgia, otorrhea, abnormal breathing sounds, cough, sputum, hemoptysis, chest pain or dyspnea). In addition, they are differentiated between URTI (rhinitis, sinusitis, faringoamigdalitis) and LRTI (laryngitis, bronchitis, bronchiolitis, pneumonia) (GUZMÁN MOLINA, *et al*., 2014) From the point of view of treatment and evolution, the complementary imaging and culture tests were also evaluated and correlated with the epidemiological profile (HASAN, *et al.*, 2014).

From the variables specified, the questionnaire for data collection was drawn up and printed, being carried out for all the medical records that fit the inclusion and exclusion criteria, totaling 182 medical records of the 482 pediatric records which were analyzed and transcribed. The data collected was organized as a database in Excel spreadsheets (Windows 2010), being double typed and validated. Statistical analysis was performed during data processing using the Statistical Package for Social Sciences (SPSS) software version 22.0. Descriptive statistics were used to characterize the subjects

regarding the variables collected. The analysis and interpretation of the processed data were then performed.

All the ethical aspects have been contemplated through the guaranteed privacy of the medical records and consequently their data, as they will be used solely and exclusively for scientific purposes. The project was submitted to the co-participant institution, to the reference hospital of the city of Recife (Hospital Infantil Maria Lucinda), and to the Research Ethics Committee of the Catholic University of Pernambuco.

3 RESULTS AND DISCUSSION

A total of 482 pediatric records were analyzed, of which 182 belonged to children from 0 to 10 years old hospitalized with hypotheses or diagnosis of respiratory diseases. The age classification used was the following: Neonates being 0-28 days old, Infants were those aged from 29 days to 2 full years, Preschoolers were aged from 2 years and a day up to 6 years, School children from more than 6 years up to 10 years. The mean age was 1.96 years, while the median was 1 year, both being found in the infant age group. The frequency of hospitalizations was 6.7% for neonates, 60.89% for infants, 24.58% for preschoolers and 7.82% for schoolchildren. Such frequency is even similar to that found by DE SOUZA, *et al* 2008, for lower respiratory tract infections in the indigenous population of Rio de Janeiro and Rio Grande do Sul, being 6.6% for Neonates, 73% for Infants and 20.4% for preschool children. In addition, compared to hospitalizations in the United States, it was found by KAISER, *et. al*, 2015, an average of hospitalization of 2.33 years for respiratory infections and specifically 6.52 years for exclusive diagnosis of asthma. In addition, as regards sex, the hospitalization of male children (53.8%) was more common, which is similar to the KAISER survey, with 55.7% for males, but differs from that found by DE SOUZA, of 48.3% for males. As to ethnicity, 67% were “Pardo”, 5.8% were White, 2.2% Yellow, 0.5% Black and 21.6% did not report their ethnicity. This scenario differs from the American survey, which found a higher occurrence for respiratory infections and for isolated asthma in Whites (42.8%) while Blacks represented 35.5%.

As for the average time of hospitalization by age group, the Neonates presented 27.75 days, Infants 5.87 days, Preschoolers 5.57 days and Schoolchildren 7.14 days. It is possible to note an inverse proportion between age and length of hospital stay for neonates when compared to the other age groups, the opposite of what was found in KAISER, et.

al, 2015, having obtained 3 days of hospitalization for newborns with LRTI and longer hospitalization time according to age. However, the data did not present statistical satisfaction, being necessary the use of the non-parametric Kruskal-Wallis method. The result being as represented on Table 1. As the method was applied, it was possible to discard the hypothesis not being valid, and upon a $p < 0.05$ it is important to consider that medians may have different values (alternative hypothesis).

Table 1: Time of stay by age group. 2019.

Age group	N	Median	Medium Post	Z-value
Scholar	14	4	90,6	0,08
Infants	107	5	82,4	-2,26
Infants	1	6	107,0	0,34
Neonate	12	20	164,8	5,24
Preschoolers	44	5	85,5	-0,60
Global	178		89,5	

Methods	GL	H value	p-value
Not adjusted for ties	4	28,07	0,000
Adjusted for ties	4	28,46	0,000

The qui-square aproximation may not be exact when some sample sizes are less than 5.

Among all hospitalizations, 7 cases (3.8%) were of URTI, being: acute tonsillitis, acute and chronic laryngotracheitis, acute mastoiditis and sinusitis. Viral laryngitis was also identified as an initial diagnosis but later classified as bronchiolitis. The mean hospitalization time for URTI was 6.9 days, with a minimum of 3 days and a maximum of 15 days in a case of chronic laryngotracheitis.

For the case of acute tonsillitis, the first treatment was with Amoxicillin + clavulanic acid for 2 days, later changed to Cephalosporin of the 1st generation for another 2 days, receiving discharge afterwards. When compared with the treatment recommended by the guideline, we note the discrepancy in duration, since Amoxicillin + clavulanic acid is used as the first choice for 7 to 10 days. However, in this case the duration was shortened because the drug regimen was replaced owing to insufficient clinical response. The second treatment was Cephalosporin of 1st generation for only 1 day, unlike the recommendation, being replaced by cephalosporin of 3rd generation,

which was used during 3 days. There was no use of previous medicines.

Among the pathogens most commonly involved in URTI are: *Haemophilus influenzae, Streptococcus pyogenes* and *Streptococcus pneumoniae*[8]. And among the acute pharyngotonsillitis, group A *Streptococcus pyogenes*. Although the coverage of penicillins and cephalosporins of the first generation (first choice) does not include gram negative cocci as *Haemophilus influenzae*, they are suitable for the main pathogens found. It is also worth noting that it is fundamental to observe and document possible recurrences, considering the risk of complications such as glomerulonephritis, rheumatic fever (avoided by the use of recommended antimicrobials) and even pediatric autoimmune neuropsychiatric disease associated with streptococcal infection (PITREZ, PITREZ, 2003; SWEDO, *et al*., 1998).

There were 2 cases of chronic laryngotracheitis ("A" and "B"). However, the characteristics for this classification were not found in literature, being only possible to suspect of membranous laryngotracheobronchitis in case "B"[6]. Neither previous medications, nor the use of antibiotics during hospitalization were reported. The use of corticosteroids was made. Between the two cases, only the "B" case presented a history of wheezing, with fever and image findings (perihilar infiltrate), being submitted to orotracheal intubation, use of vasoactive drugs, nasogastric tube and nebulization with antimuscarinic. However, the reason for the need for intubation is not reported in the case, although it is known that it is indicated in the treatment of supraglottitis (COSTA, 2010) In spite of fever and severe conditions, antibiotic therapy was not used, which would be indicated in chronic bacterial laryngotracheitis, whose main pathogen is methicillin-resistant *Staphylococcus aureus* (MRSA) (CARPENTER, KENDALL, 2018) It is worth noting that the evaluation would be more appropriate if the diagnostic hypotheses were placed according to the International Classification of Diseases (ICD) as a routine in all health institutions. While case "A" had a hospital stay of 8 days and was discharged, case "B" had a stay of 15 days and only "Administrative closure" is present in its medical record. In addition, case "B" was the only case of URTI that went to the ICU, where he spent 10 days. Another relevant factor is that usually the cases of greater severity and therefore, that lead to hospitalization, are of LRTI, since URTI are usually of viral etiology and self-limited (HERENDEEN, SZILAGY, 2000).

An acute laryngotracheitis was also found, which was discharged after 3 days of hospitalization. The patient received pre-hospital treatment with corticosteroid (Dexamethasone) but the duration of the use was not informed. The use of corticosteroids

was also reported during hospitalization, those being Hydrocortisone and Prednisolone for the period of 2 days, as according to the literature, since normally acute laryngotracheitis are of viral etiology and the use of antibiotics is only recommended in cases of secondary infections (COSTA, 2010).

In the case of mastoiditis no previous medications were reported, and the medications used were oxacillin in combination with cephalosporin of the 3rd generation during the 8 days of hospitalization. The most prevalent agent is *Streptococcus pneumoniae*, followed by *Haemophilus influenzae*, *Moraxella catarrhalis*, Group A beta-hemolytic *Streptococcus, Pseudomonas aeruginosa*, *Staphylococcus*, anaerobes and *Proteus mirabilis* (MARQUES, *et al.*, 2013). However, the agent was not isolated and no further examinations were carried out. The recommended initial treatment of mastoiditis is myringotomy with collection of secretion for the study of gram staining and culture, as well as the beginning of the use of antibiotics which can be adjusted according to the result obtained from the culture. The most commonly used antibiotics are ampicillin with sulbactam with good coverage for gram-negative and anaerobic aerobes, if *Pseudomonas aeruginosa* is identified, the sensitivity of the agent should be investigated, and 3rd generation cephalosporin is adequate (COSTA, ROSITO, CARVALHAL, 2005).

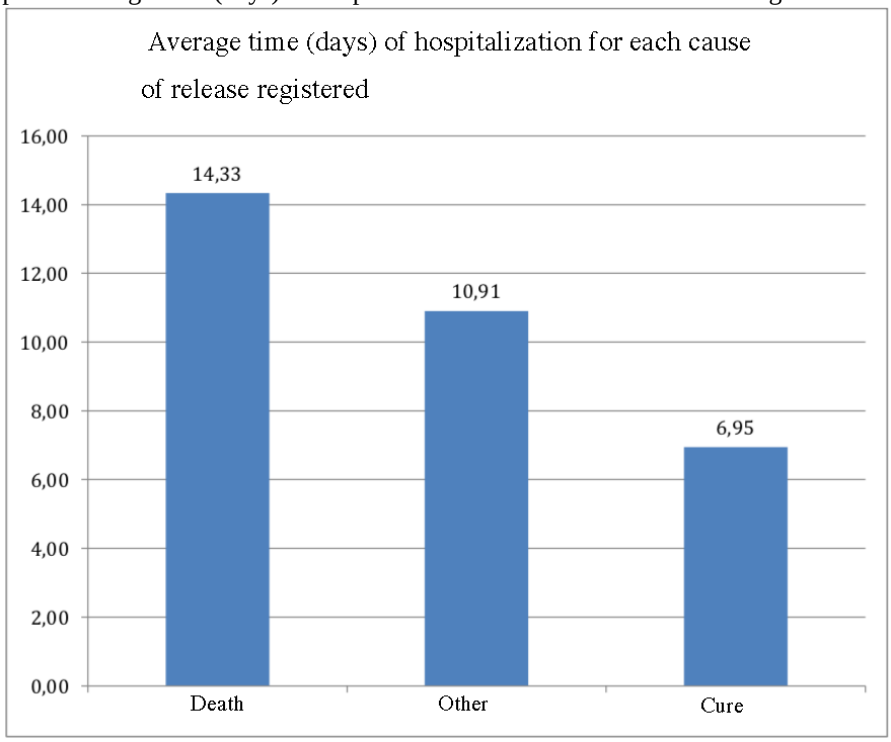
There was also one case of Sinusitis, which was treated with Amoxicillin, then Amoxicillin with clavulanic acid (whereas it would be more appropriate to replace the medication, since it was refractory to the previous treatment), and then ampicillin for 4 days. However, according to the guidelines the appropriate treatment would be either amoxicillin alone or amoxicillin associated with clavulanate, for 5 to 10 days and refractory cases the second-line antibiotics should be used, comprising Cephalosporins, Respiratory Quinolones, Clindamycin or Metronidazole. It is worth noting that the most common bacterial pathogens are *Streptococcus pneumonieae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* (SLAVIN, *et al*., 2005) The total hospitalization time was 5 days, and was discharged for improvement at the end. He did not require orotracheal intubation nor did he have other signs of complications such as mechanical ventilation, ICU or death (KAISER, *et al*., 2015).

As for the LRTI, they are the most common cause of hospitalization, accounting for 96.2% of the medical records analyzed. Pneumonia was the most frequent cause of hospitalization (48.9%) out of all respiratory cases in children. Followed by Asthma (20.3%), Bronchiolitis (12.1%), Bronchitis (6%), Wheezing Crisis (3.8%), and others such as Macleod Syndrome (2 cases), Meconium Aspiration Syndrome (2 cases),

neonatal sepsis (2 cases), miliary tuberculosis (1 case), respiratory distress syndrome (1 case) and septicemia (1 case).

The mean length of hospital stay was 8.45 days for pneumonia, and 7.3 days was the mean length amongst all cases. It is worth mentioning that among the patients who were cured when discharged, the mean hospitalization time was 6.95 days, while the patients with "Other" discharge reasons had a mean of 10.91 days of hospitalization, and the patients who died had 14.33 days as an average of hospitalization time (as presented in Graph 1), reinforcing the index of hospitalization time as being valid for prognosis, as raised by KAISER, *et. al* 2015.

Graph 1: Average time (days) of hospitalization for each cause of release registered. 2019.



Nevertheless, upon statistical analysis the data did not present statistical satisfaction, being necessary the use of the non-parametric Kruskal-Wallis method as shown in Table 2. As the method was applied, it is important to consider that the hypothesis may not be valid for the p-value found was $p > 0.05$ or the medians may have different values (alternative hypothesis).

Table 2: Time of stay in days according to each cause of release registered. 2019.

Reason of discharge	N	Median	Medium Post	Z-Value
Cure	1	2	12,0	-1,51
Cure	165	5	89,5	-0,88
Death	3	17	152,3	2,07
Other	11	7	96,2	0,38
Global	180		90,5	

Method	GL	H Value	p-Value
Not adjusted for ties	3	6,69	0,082
Adjusted for ties	3	6,79	0,07

The qui-square aproximation may not be exact when some sample sizes are less than 5.

The cause of the longest hospital stay time was neonatal sepsis, it being 63 days. Among the 7 Hemotransfusion cases (3.8%), 3 evolved to death, one due to Neonatal Pneumonia, one due to neonatal sepsis and one due to respiratory distress syndrome. According to the literature, pneumonia is the most important preventable cause of death, while half of the deaths caused by pneumonia occur in children younger than one year (NASCIMENTO-CARVALHO, SOUZA-MARQUES, 2004). The only cured case in the hemotransfusion group was a case of neonatal sepsis, which did not receive any vasoactive drugs. Still in this group, there was a case of Streptococcal Pneumonia that received "Administrative Closure", which according to the protocol of the hospital is done when the medical record becomes very large, so it is closed and a new one is opened, which shows another problem due to the lack of digitization of medical records, since in this process there is a great risk of loss of information. Finally, the other cause of Hemotransfusion was also in a case of pneumonia, which was transferred to another hospital after 7 days of hospitalization, also without use of vasoactive drugs.

Out of all respiratory cases, 11 went to the ICU, representing 6% of the total. The causes were: Neonatal sepsis (2 cases), Streptococcal pneumonia (1 case), Sepsis secondary to pneumonia (1 case), Pneumonia (3 cases), Meconium Aspiration Syndrome (1 case), Chronic Laryngotracheitis (1 case) and Sepsis secondary to Pneumonia by Assisted Mechanical Ventilation (1 case). Among these, 2 had already started antibiotic

therapy prior to hospitalization with Ampicillin and Gentamicin (Neonatal Pneumonia and Sepsis), while 2 cases received no antibiotic therapy (Chronic Laryngotracheitis and Acute Bronchiolitis).

Vasoactive drugs were used in 11 cases, representing 6% of the total, with the causes being: Neonatal sepsis (1 case), Streptococcal pneumonia (1 case), Sepsis secondary to pneumonia (1 case), Pneumonia (4 cases) (1 case), Respiratory distress syndrome (1 case), Chronic laryngotracheitis (1 case) and sepsis secondary to pneumonia by Assisted Mechanical Ventilation (1 case). The drugs used were: Dobutamine in 7 cases, caffeine in 4 cases, Dopamine in 3 cases and Adrenaline in 3 cases. Of all, there were 3 deaths, 3 were registered as "other" and 5 were discharged. The lowering of the level of consciousness occurred in 14 cases, which were the same ones that used the vasoactive drugs, plus 1 case of neonatal sepsis (same as for the ICU), 1 case of pneumonia and 1 case of asthma. It is worth mentioning that the mean length of hospital stay was significantly higher in patients who had consciousness lowering, being 22.71 days among those as opposed to 6.05 days among the others. Upon statistical analysis, for a p-value lower than the significance level of 5% (95% CI), there is insufficient evidence to support the null hypothesis that the population averages are all equal. In other words, we can say that at least one medium is different. Possibly, the group 'Yes' is the one that stays the most hospitalized, by amount of days. The results are shown in Table 3.

Table 3: Time of stay in days among patients with or without lowering of consciousness. 2019.

Lowering of consciousness	N	Median	Medium post	Z-Value
No	164	5	84,1	-4,75
Yes	14	16	152,3	4,75
Global	178		89,5	

Method	GL	H-Value	p-Value
Not adjusted for ties	1	22,59	0,000
Adjusted for ties	1	22,89	0,000

The qui-square approximation may not be exact when some sample sizes are less than 5.

Surgical interventions were performed in 42 cases (23.1%), of which 90.5% underwent venoclysis, 11.9% underwent thoracic drainage, 2.4% underwent abscess drainage and 2.4% underwent umbilical catheterization. Among the cases of venoclysis, 68.4% had pneumonia, 5.2% had asthma, 7.9% had bronchiolitis, 2.6% had miliary Tuberculosis, 2.6% had sinusitis, and 2.6% had tonsillitis. Abscess drainage occurred in a case of Bronchiolitis. Thoracic drainage occurred in 5 cases of pneumonia, all of which achieved complete cure. Umbilical catheterization was performed in one case of pneumonia.

Orotracheal intubation was performed in 12 cases and nasotracheal intubation in 1. Thus, the 13 cases of intubation represent 7.1% of all hospitalizations. There were re-intubations in 7 cases (53.8%) which represents a risk of hospital respiratory infections, and is present even in the case of sepsis secondary to pneumonia through mechanical ventilation. Among the cases of re-intubations, 2 had no discontinuation of sedation, while the other 5 had. In addition, among the cases of re-intubations, 2 received tracheal aspiration, being found secretions in only one of them, while in the second it was found tracheal and pulmonary bleeding. Finally, mean length of hospital stay was significantly longer for patients who underwent orotracheal intubation, being 26.17 days, while for nasotracheal intubation (only 1 case) it was 2 days, and among those who did not receive intubation were 6,01 days. When the statistical analysis was made, a p-value lower than the significance level of 5% (95% CI) was found, therefore there is insufficient evidence to support the null hypothesis that the population averages are all equal. In other words, we can say that at least one medium is different (alternative hypothesis). Possibly, the group 'Orotracheal intubation' is the one that stays the most hospitalized, by amount of days. The results are shown in Table 4.

Table 4: Time of stay in days among patients with nasotracheal, orotracheal or no intubation. 2019.

Intubation	N	Median	Medium post	Z-value
Nasotracheal	1	2	12,0	-1,51
Orotracheal	12	20	165,4	5,22
None	166	5	85,0	-4,60
Global	179		90,0	

Method	GL	H-Value	p-Value

Not adjusted for ties	2	29,22	0,000
Adjusted for ties	2	29,63	0,000

The qui-square approximation may not be exact when some sample sizes are less than 5.

Food was given orally in 163 cases (89.6%), by gastric tube in 11 cases (6%), by enteral tube in 1 case and by parenteral route in 2 cases. Among the gastric and enteral tube nutrition cases, only 5 had in medical records a register that diet infusion had been performed while they were in supine position, a fundamental factor for preventing hospital respiratory infections. Decubitus above 30 degrees was reported in 47 cases (25.8%), while 20 were uninformed (10.9%) and in 47 cases it was not done (25.8%), being important to keep the decubitus high for infection prevention. Changes in the pattern of evacuation occurred in 19 cases (10.4%), of which 14 had constipation (73% of the altered) and 5 had diarrhea (26.3%). In one of the cases of constipation Colostomy was performed, while in the others clinical treatment was carried out. Regarding the alteration of the diuresis pattern, it only occurred in 2 cases, both being decreases. In one case, there was bexigoma and Furosemide was administered, while in the other, a bladder catheterization was performed. Of all the cases analyzed only 1 had recent abdominal surgery in a case of asthma, for which the surgery did not represent a causal factor.

Among the devices used during hospitalization, the Nebulizer was used in 74.7% of cases, Venturi mask in 30.8% of cases, Spacer in 15.9% of cases, CPAP in 6% of cases, Halo in 5.5% of cases, Manual Resuscitators in 1.6% of cases, O2 Analyzer in 0.5%, Oxygen mask in 0.5% of cases and Contact isolation in 0.5% of cases (which was only in a case of miliary Tuberculosis).

Due to the cost of isolating the pathogen, the treatment is given according to the age group and the most epidemiologically found bacteria. Antibiotics were prescribed in 112 cases and antifungals in 3 (one nystatin, prescribed under the hypothesis of acute viral bronchiolitis, two fluconazole under the hypothesis of neonatal sepsis and respiratory distress syndrome of the newborn). Among the antibiotics, the most prescribed was Ampicillin (30.8%), followed by 3rd generation Cephalosporin (18.7%) Amoxicillin (12.1%), Oxacillin (12.1%), Gentamicin (7.7%), Amoxicillin with clavulanate (7.1%), Azithromycin (7.1%), Amikacin (3.8%), 1st generation Cephalosporin (2.2%), Chloramphenicol (2.2%), Meropenem (0.5%), Vancomycin (1.6%), Ciprofloxacin (0.5%), 4th generation Cephalosporin (0.5%), Clindamycin (0.5%), Piperacillin / Tazobactam (0.5%), , Polymyxin B (0.5%), and Amphotericin (0.5%).

The use of pre-hospital antibiotic therapy was reported in 24 cases, the mean time of hospitalization being less for these patients, with 6.75 days, while those who had not taken prior antibiotic therapy had a mean of 7.42 days of stay. The case of miliary tuberculosis used the second largest amount of antibiotics, comprising: Amoxicillin-Clavulanate (2 days), Oxacillin 9 days), 1st generation cephalosporin (2 days) and 3rd generation cephalosporin (10 days), those being less in number only than those used in the case of death by pneumonia, another case of pneumonia that was cured and one case of neonatal sepsis. It was the only case in which respiratory isolation was performed. Findings on imaging tests were only consolidation apparent in the chest X-ray. Leukocytosis was present.

Hemoculture was performed in 6 cases, with 4 negative cases (one neonatal sepsis death, one neonatal respiratory distress syndrome, one pneumonia and one septicemia), and positive in two cases: neonatal sepsis and pneumonia.

In the case of neonatal sepsis, hospitalization lasted 63 days and was cured, and 4 blood cultures with negative results were performed, followed by 2 more blood cultures, one positive for *Streptococcus pneumoniae* and one for multiresistant *Pseudomonas*. There was also a catheter tip culture positive for *Klebsiella pneumoniae*. In this case 6 antibiotics were used in 3 different schedules (Ampicillin + Gentamicin, Amikacin + Oxacillin and Cephalosporin of 4th generation + amikacin), with a total of 31 days of antibiotic therapy.

The case of Pneumonia spent 72 days hospitalized but was cured. Positive blood cultures were found for Streptococcus viridans, sensitive to ampicillin, 4th generation cephalosporin, vancomycin, erythromycin, clindamycin, cephalosporin 3rd and penicillin. He received 5 antibiotics in 3 different schemes (Ampicillin + gentamicin, 3rd generation cephalosporin and Meropenem + Vancomycin). The most common etiological agents of LRTI are *Bordetella* spp., *Chlamydia trachomatis* spp., Enterovirus, *Haemophilus influenzae*, *Klebsiella pneumoniae*, *Legionella pneumophila*, *Moraxella catarrhalis*, *Mycoplasma pneumoniae*, parainfluenza, *Staphylococcus aureus*, *Streptococcus pneumoniae*, cytomegalovirus, influenzae, Epstein-Barr virus, rhinovirus, measles and human orthopneumovirus[9]. Although not mentioned in the literature among the most common, *Pseudomonas* is frequently associated with severe pneumonia or hematogenous dissemination are common agents (ALHAZMI, 2015). In this case there was no confirmation of antimicrobial susceptibility, which would be fundamental since different agents were found, one of which is pseudomonas, whose research from

TURANO, 2012, recommends for the Brazilian profile the use of polymyxin B, Piperacillin / tazobactam, Aztreonam and Tigecycline, none of which was used.

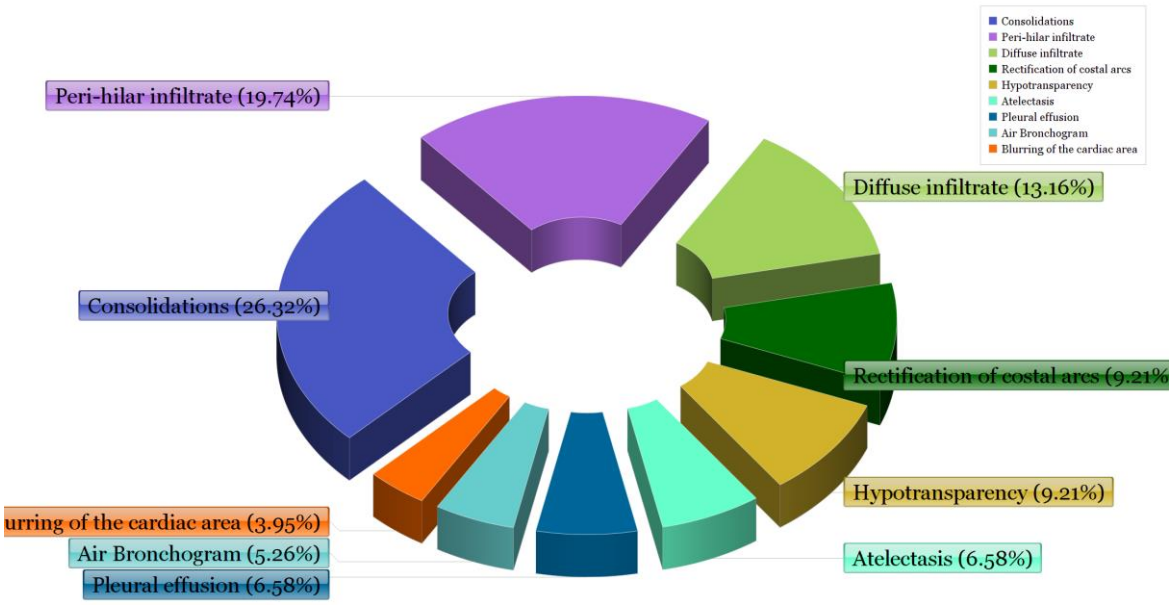
Infection with *Streptococcus* viridans is also reported with a high incidence, especially in infections of the paranasal sinuses. Its resistance profile according to KELES, ARAL and ALPAY, 2006, was 33.3% resistant to tetracyclines, 23.8% resistant to Chloramphenicol and 19.04% resistant to penicillin, differing from the sensitivity test found.

It is not possible to adequately analyze the hospital profile since only 2 cases achieved isolation of the etiological agent. Nevertheless, it is worth mentioning that the treatment performed in both respects the one recommended by the literature.

There were no cases in which the bronchial aspirate was analyzed. There was one case in which the sputum analysis was performed, the case of sepsis secondary to Pneumonia by mechanical ventilation, but the result was negative. Thoracocentesis was performed in 3 cases of pneumonia, of which 1 did not find any fluid and 2 found pleural effusion, one complicated parapneumonic pleural effusion and an extensive pleural effusion. Among other complementary findings, 15 medical records (8.2%) had done reactive protein c measurements, of which 8 were always with non-reactive values and 7 had positive results, of which the largest was 96 mg / L. Leukocytosis was found in 34 cases (18.7%) and leukopenia in 4 cases (2.2%). Cases with leukocytosis had an average time of hospitalization of 9.5 days, while those who did not had had a mean of 6.77 days of hospitalization. For leukopenia, the difference is accentuated, with the mean time of hospitalization being 13.25 days for patients with leukopenia and 7.72 days for patients without leucopenia. When analyzing the hospitalization time with the presence of leucopenia or leukocytosis, we have 13.25 days, while the patients with the absence of both have an average of 6.27 days hospitalized.

Among the radiographs performed, many had no data, but among those that had the findings were: consolidations (26.32%), perihilar infiltrate (19.74%), diffuse infiltrate (13.16%), rectification of arches (9.21%), atherosclerosis (6.58%), pleural effusion (6.58%), air bronchogram (5.26%) and cardiac area %) (As illustrated in Graph 2)

Graph 2: Representativity of Radiological Findings, 2019.



Regarding the prehospital conditions, the use of pre-hospital nebulization was performed in 25 cases with beta two agonists (13.7%), 2 of whom also used saline solution. The mean time of hospitalization in days among people who did not perform pre-hospital nebulization was 8.13 days, while among those who performed it was 4.89 days. Nebulization in hospital was performed in 74.7% of cases, of which 80.2% used a beta-2-agonist, 26.5% used anticholinergics, 6.6% used adrenaline, 5.1% used corticosteroids inhalants, 3.6% used saline solution and 3.6% used oxygen.

The use of prehospital corticosteroids was reported in 25 cases (13.7%), of which were: Prednisolone 64%, Hydrocortisone 20%, Dexamethasone 8%, Budesonide 4%. The mean time of hospitalization among people who had not previously used corticosteroids was 7.56 days, while among those who had used it was 5.8 days. Hospital corticosteroids were used in 59.3% of the cases, with Prednisolone being used in 61.1%, Hydrocortisone 10.2%, Dexamethasone 6.5%, Budesonide 1.8% and Beclomethasone 0.9%. Among these, the use of a corticosteroid alone occurred in 60.2% of the cases, with Prednisolone being 69.2%, Hydrocortisone 24.6%, Dexamethasone 4.6%, Budesonide 1.5%. Among the cases that used the association of corticosteroids (21.3%), 95.6% used 2 corticosteroids, while 4.4% used more than 2 corticosteroids.

4 CONCLUSION

Finally, the longest hospital stay was in the neonatal age group, with 27.75 day. Infants spent 5.87 days, Preschool 5.57 days and School 7.14 days. The main antimicrobials were ampicillin and cephalosporin of the third generation, and the most commonly used tests were chest radiograph and blood analysis. Of all the cases, 6% went to the ICU. Out of 182 cases, only 3 died (1.6%), showing an overall high cure rate. Among the factors present in the hospital environment, intubation was performed in 7.1%, re-intubations in 53.8% of these, and the high decubitus position was not performed in 25.8% of all hospitalizations. It is worth noting that all of the above figures are based on the information present and legible in the medical records, while a large part was incomplete. Therefore, it is essential to improve the filling of medical records, since their lag causes great difficulty for the construction of medical knowledge, as well as the intelligibility of many and the absence of questions of relevance, observations and examinations, both clinical and laboratory.

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