

Factors associated with peripherally inserted central catheter dressing dwell in infants

Fatores associados ao tempo de permanência do curativo do Cateter Central de Inserção Periférica em lactentes
Factores relacionados con el tiempo de permanencia del apósito del catéter central de inserción periférica en lactantes

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Abstract

Objective: To verify the Peripherally Inserted Central Catheter (PICC) dressing dwell time in infants and its correlation with infant, catheter, and nursing care demographic and clinical variables.

Methods: Prospective, descriptive-analytical study conducted at the neonatal unit of a public pediatric hospital, including 23 infants undergoing PICC insertion with daily dressing assessment. We analyzed infant, catheter, and nursing care demographic and clinical variables, using the Kruskal-Wallis, Wilcoxon-Mann-Whitney tests, correlation coefficient, Spearman correlation, and a 5% significance level.

Results: Dressing dwell time ranged from 2 to 11 days (mean 3.7), with soiling as the main reason for change. Longer dwell time was associated with full-term gestational age, longer hospital stay, larger catheter gauge, analgesia use, prolonged catheter use, intermittent infusion, polytherapy, intensive care admission, incubator use, bed bath, and catheter displacement.

Conclusion: dressing dwell time varied among infants and was influenced by clinical, catheter, and nursing care factors, highlighting priorities for maintenance.

Keywords

Neonatal nursing; Evidence-based practice; PICC Line Catheterization; Newborn; Technology Assessment.

Resumo

Objetivo: Verificar o tempo de permanência do curativo do Cateter Central de Inserção Periférica (CCIP) em lactentes e sua correlação com variáveis demográficas e clínicas do lactente, do cateter e dos cuidados de enfermagem.

Métodos: Estudo prospectivo, descritivo-analítico, realizado na unidade neonatal de um hospital pediátrico público, incluindo 23 lactentes submetidos à inserção de CCIP com avaliação diária do curativo. Foram analisadas variáveis demográficas e clínicas do lactente, do cateter e dos cuidados de enfermagem, utilizando os testes de Kruskal-Wallis, Wilcoxon-Mann-Whitney, coeficiente de correlação de Spearman e nível de significância de 5%.

Resultados: O tempo de permanência do curativo variou de dois a 11 dias (média de 3,7 dias), sendo a sujidade o principal motivo para sua troca. Maior tempo de permanência do curativo esteve associado à idade gestacional a termo, maior tempo de internação hospitalar, maior calibre do cateter, uso de analgesia, tempo prolongado de utilização do cateter, infusão intermitente, politerapia, internação em unidade de terapia intensiva, uso de incubadora, banho no leito e deslocamento do cateter.

Conclusão: O tempo de permanência do curativo variou entre os lactentes e foi influenciado por fatores clínicos, relacionados ao cateter e aos cuidados de enfermagem, destacando prioridades para sua manutenção.

Descritores

Enfermagem neonatal; Prática baseada em evidências; Cateterismo por CCIP; Recém-nascido; Avaliação de tecnologia.

Resumen

Objetivo: Verificar el tiempo de permanencia del apósito del catéter central de inserción periférica (CCIP) en lactantes y su correlación con variables demográficas y clínicas del lactante, del catéter y de los cuidados de enfermería.

Métodos: Estudio prospectivo, descriptivo-analítico, realizado en la unidad neonatal de un hospital pediátrico público, en el que se incluyeron 23 lactantes sometidos a la inserción de un CCIP con evaluación diaria del apósito. Se analizaron las variables demográficas y clínicas del lactante, del catéter y de los cuidados de enfermería, utilizando las pruebas de Kruskal-Wallis, Wilcoxon-Mann-Whitney, el coeficiente de correlación de Spearman y un nivel de significación del 5 %.

Resultados: El tiempo de permanencia del apósito osciló entre dos y once días (media de 3,7 días), siendo la suciedad el motivo principal para su cambio. Un mayor tiempo de permanencia del apósito se asoció a la edad gestacional a término, un mayor tiempo de hospitalización, un mayor calibre del catéter, el uso de analgesia, un tiempo prolongado de uso del catéter, la infusión intermitente, la politerapia, la hospitalización en la unidad de cuidados intensivos, el uso de la incubadora, el baño en la cama y el desplazamiento del catéter.

Conclusión: El tiempo de permanencia del apósito varió entre los lactantes y se vio influido por factores clínicos, relacionados con el catéter y con los cuidados de enfermería, lo que pone de relieve las prioridades para su mantenimiento.

Descritores

Enfermería neonatal; Práctica basada en la evidencia; Cateterismo por CCIP; Recién nacido; Evaluación de tecnologías.

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The study data are available in this article.

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Introduction

Peripherally Inserted Central Catheters are devices used most frequently in neonatal units. They guarantee a less traumatic insertion for infants, in addition to greater reliability of access, lower risk of phlebitis, infiltration, or extravasation, among other advantages.⁽¹⁾

Procedures related to the peripherally inserted central catheter, especially related to the insertion and removal of this type of catheter, have already been extensively researched.⁽²⁻⁸⁾ Furthermore, studies on its relationship with bloodstream infection, need for analgesia, procedures for its adoption and maintenance, suitable places for its insertion, infusion types, and causes for non-elective withdrawal, among others, made it possible to establish international recommendations.⁽⁹⁾

Therefore, despite advances in other aspects of peripherally inserted central catheter management, the evidence base concerning optimal dressing type and management remains insufficiently standardized,⁽¹⁰⁻¹²⁾ reinforcing the need for further well-designed investigations in this population.⁽¹⁾

Considering the central role of nurses in peripherally inserted central catheter management,⁽¹³⁾ particularly in dressing assessment, maintenance, and replacement, generating evidence to support clinical decision-making in this area is essential. In pediatric settings, where infants present greater skin fragility and increased risk of catheter-related complications, defining parameters associated with dressing dwell time may contribute to safer care, reduction of unnecessary manipulations, and prevention of adverse events.

By identifying factors associated with peripherally inserted central catheter dressing dwell time in infants, this study seeks to provide data that may inform clinical protocols, optimize nursing practices, and support evidence-based recommendations tailored to this population. Therefore, this study aimed to verify peripherally inserted central catheter dressing dwell time in infants and its correlation with infant, catheter, and nursing care demographic and clinical variables.

For peripherally inserted central catheter maintenance, it is essential to use appropriate dressings that are effective in preventing colonization and infections, low cost, comfortable, easy to use, and safe to avoid accidental catheter removal or damage.⁽¹³⁾ A prospective study with 92 infants found that dressing change

frequency varies according to the type of central catheter, emphasizing fewer dressing changes and general complications compared to peripherally inserted central catheter.⁽¹¹⁾ Another Brazilian study with 108 infants identified that more than two dressing changes are related to the prevalence of adverse events.⁽¹⁴⁾

Transparent film is the gold standard in catheter dressings, especially central ones. It is recommended to use the dressing indefinitely in the absence of humidity, dirt, or loss of integrity.⁽⁹⁾ The recurrent peripherally inserted central catheter dressing change can increase skin reactions⁽¹⁵⁾ and impact non-elective catheter removal, given that there is a relationship between a greater number of changes and bloodstream infection, as evidenced in adults.⁽¹⁶⁾ In addition, longer dressing duration avoids complications that lead to non-elective catheter removal, interruption of intravenous therapy, exposure of infants to a new procedure, and the commitment of specialized labor.^(6,16)

Methods

A prospective, descriptive-analytical study carried out at the neonatal unit of a tertiary-level pediatric hospital of medium complexity that uses the Public Health System for assistance, the Brazilian health system. This hospital, located in the east of the city of São Paulo, is a reference for the region. The institution strictly follows international standards of peripherally inserted central catheter care, maintenance, and removal.⁽⁹⁾ In addition, all nurses in the unit received training on the dressing change procedure before the research with lectures on international recommendations in peripherally inserted central catheter management.

We included infants admitted to the neonatal unit with peripherally inserted central catheter implantation with a sterile transparent dressing. We excluded infants transferred to another institution.

We excluded infants transferred to another institution, those admitted to the neonatal unit with a peripherally inserted central catheter using a sterile transparent dressing, and those who experienced catheter loss before the compressive dressing change were excluded.

Data collection took place prospectively from peripherally inserted central catheter insertion, col-

lecting data from medical records, and direct and systematic observation of dressings in daily visits to the neonatal unit. All data were verified by the same nurse, member of the Peripherally Inserted Central Catheter Committee, who worked at the unit where the research took place. As a committee member, this nurse had extensive experience assessing peripherally inserted central catheter-related conditions.

We assessed the intervals between dressing changes (number of days) from the compressive dressing replacement with gauze and transparent film, to conventional dressing, with only transparent film. Moreover, the necessary tractions were performed when replacing the compressive dressing with the conventional one.

The instrument for data collection was built by the researcher based on other studies⁹. The form consisted of open- and closed-ended questions presented in two parts: (a) non-modifiable variables (demographic and catheter characteristics), (b) modifiable variables (clinical characteristics, intravenous therapy, infant and catheter nursing care). Both parts were submitted to assessment by two neonatal nurses with experience in the area before implementing the study. Moreover, skin integrity was assessed using the Newborn skin condition instrument⁽¹⁷⁾ before catheter insertion and during dressing changes, observing local skin complications.

All procedures related to peripherally inserted central catheter dressings at the study site followed international standards, i.e., they used 0.5% alcoholic chlorhexidine, sterile gauze, and gloves. In addition, a transparent polyethylene and polyurethane film, polyacrylate adhesive, white silicone paper, brand Leukomed I.V Film®, dimensions 6x8 cm, with stabilizing tapes for fixing the catheter flaps, were used.

The dependent variable was the maximum dressing duration of the peripherally inserted central catheter (PICC), that is, the number of days the dressing remained in place for the longest time in each infant who underwent PICCA placement. The independent variables were divided into three groups. (Table 1)

Data were double-entered in a Microsoft Excel spreadsheet (2010 version) and analyzed in R, version 3.5.1 (Microsoft®, Washington, USA), by a statistician. Categorical variables were described by absolute and relative frequencies. Numerical variables were analyzed with means, standard deviations, and medians.

Table 1. Characterization of dependent and independent variables

Type of Variable	Category	Variables
Dependent		Maximum dwell time of the PICC dressing (days)
Independent	Infant characteristics	Sex; skin color; gestational age at birth; PICC dressing site; nutritional status prior to insertion; chronological age at insertion; weight at insertion and removal; length of hospital stay; primary diagnosis; 1- and 5-minute Apgar scores; laboratory tests (platelets, hematocrit, red blood cells); skin condition score at admission
Independent	PICC and infusion characteristics	Catheter gauge; puncture site; body side; insertion method; tourniquet use; analgesia use; contrast use; PICC position; post-insertion traction; number of indications for insertion; number of pain relief methods; duration of PICC use; infusion type; type of intravenous therapy
Independent	Nursing care characteristics	Unit allocation; type of accommodation; mean incubator temperature; mean infant temperature; use of insulation; type of bathing; caregiver participation

Caption: PICC - Peripherally Inserted Central Catheter

The Kruskal-Wallis, Wilcoxon-Mann-Whitney tests, Spearman's correlation coefficient, and correlation test were used to establish correlations between the dependent and independent variables. A significance level of 5% was adopted.

The research was authorized by the (medical and nursing) board of the hospital and approved by the Research Ethics Committee of the University of São Paulo School of Nursing (Certificate of Presentation for Ethical Consideration No. 86761818.3.0000.5392; Ethics Committee Approval No. 2.660.410). Furthermore, all ethical aspects related to research with human beings were respected, according to Resolution 466 of December 2012 of the Brazilian National Health Council. Data were collected between May and November 2018 upon signing the Informed Consent Form by the infants' legal guardians, requested at peripherally inserted central catheter indication.

Results

Recruitment and losses

Of the 29 infants who met the eligibility criteria, 23 were included. Two were excluded due to transfer to another

er service, and four to catheter loss before compressive dressing change. In addition, two of the 21 infants included required a new peripherally inserted central catheter insertion and were reintroduced into the study as new participants, totaling 23 infants for analysis.

Clinical and demographic characteristics

Most infants were male (87.0%), white (82.6%), term (69.6%), undergoing treatment for genitourinary (30.5%), or respiratory morbidity (26.1%), and with adequate nutritional status (69.6%) (Table 2).

Peripherally Inserted Central Catheter insertion

The reasons for peripherally inserted central catheter insertion were prolonged antibiotic use (69.5%), venous fragility (52.1%), vasoactive drug (21.7%), venous hydration (17.3%), sedation (4.3 %) and others (4.3%). Non-pharmacological pain relief methods used during insertion were restraint (52.1%), restraint and pacifier (17.3%), restraint and sweetened solution (35%), and sweetened solution and pacifier (26.0%); the pharmacological methods associated with the non-pharmacological ones covered about 65% of infants.

During the peripherally inserted central catheter stay, seven infants (30.4%) were allocated to the Intensive Care Unit, and four infants (17.4%) were allocated to intermediate care. The others moved between care units, one infant in intensive care and intermediate care (4.3%), five in intensive and semi-intensive care (21.7%), and four in semi-intensive and intermediate care (17.4%).

Peripherally inserted central catheter dressing change

Most (87.0%) compressive dressing replacements by the transparent film were performed before 48 hours. However, two dressings (8.7%) were replaced after 48 hours, and one (4.3%) peripherally inserted central catheter was removed before the first change from compressive dressing to transparent film. The main reasons for changing the dressing were dirt (43.9%), loss of integrity (41.5%), and the presence of humidity (14.6%).

Follow-up of 23 infants yielded 252 days of follow-up, in which peripherally inserted central catheter

Table 2. Association between the mean peripherally inserted central catheter dressing dwell time and sample demographic and clinical characteristics (n=23).

Variables	Total n(%)	Longer dressing maintenance			
		Mean	SD	95%CI	p-value
Sex					
Male	20(87.0)	3.8	3.172	3.5-6.5	0.8889†
Female	3(13.0)	3.0	2.646	4.5-4.5	
Skin color					
White	19(82.6)	4.1	3.117	4.0-7.0	0.2467†
Brown	4(17.4)	2.0	2.449	4.0-4.0	
Gestational age					
Preterm	7(30.4)	1.7	3.147	6.0-6.0	0.0267†
Term	16(69.6)	4.6	2.683	3.5-6.5	
Morbidity in treatment					
Genitourinary	7(30.5)	1.6	2.070	3.0-3.0	0.1357‡
Respiratory	6(26.1)	3.2	3.125	2.0-8.0	
Cardiac	5(21.7)	5.6	2.060	4.0-7.5	
Neurological	2(8.7)	4.0	4.000	1.0-3.0	
Gastrointestinal	2(8.7)	7.5	4.949	4.0-11.0	
Blood	1(4.3)	4.0	4.000	4.0-4.0	
PICC pre-insertion nutritional status					
Adequate	16(69.6)	4.2	2.910	3.5-7.0	0.2199†
Inadequate	7(30.4)	2.4	3.259	4.0-8.0	
Gauge					
1.9 French	9(39.1)	1.7	2.121	3.0-4.5	0.0111†
3.0 French	14(60.9)	5.0	2.909	4.0-7.0	
Catheter puncture site					
Cephalocervical	10(43.5)	4.0	2.582	3.0-7.0	0.4232‡
Upper limb	12(52.1)	3.7	3.467	4.0-8.0	
Lower limb	1(4.4)	0	0	-	
Cerebral hemisphere					
Right	13(56.5)	3.5	2.933	3.0-7.0	0.7759†
Left	10(43.5)	3.9	3.381	3.5-9.0	
Puncture method					
Direct	17(73.9)	4.2	3.153	3.5-7.0	0.2113†
Indirect	6(26.1)	2.2	2.401	4.0-4.0	
Analgesia use					
Yes	15(65.2)	4.7	3.105	4.0-7.5	0.0123†
No	8(34.8)	1.7	1.909	3.0-4.0	
Contrast use					
No	22(95.7)	3.9	3.028	3.5-6.5	0.1911†
Yes	1(4.3)	0	-	-	
PICC site					
Central	16(69.6)	4.1	3.415	3.5-7.5	0.4534†
Peripheral	7(30.4)	2.0	2.116	3.5-4.5	
Traction after insertion					
No	14(60.9)	3.4	1.697	3.5-4.5	0.9605†
Yes	9(39.1)	4.1	4.567	5.0-10.0	

Caption: SD - standard deviation; PICC - Peripherally Inserted Central Catheter †Wilcoxon-Mann-Whitney test; ‡Kruskal-Wallis test.

dressings were changed 41 times. The mean peripherally inserted central catheter dressing dwell time was 3.7 days: 2.9 days before the second exchange; three days before the third exchange; five days before the fourth exchange; and 6.5 days before the fifth exchange.

Table 3. Correlation between the mean peripherally inserted central catheter dressing dwell time and sample demographic and clinical characteristics (n=23).

Variables	Mean	Correlation coefficient*	p-value
Chronological age (days)	34.35	0.010	0.9650
Weight at insertion date (kg)grams	3304.57	0.254	0.2430
Weight at withdrawal date (kg)grams	3500.00	0.327	0.1280
Length of hospital stay (days)	22.40	0.490	0.0180
Number of diagnoses	2.69	0.218	0.3180
1-minute Apgar	8.48	-0.048	0.8260
5-minute Apgar	9.39	0.030	0.8910
Platelets (thousand)	390.00	-0.125	0.5700
Hematocrit (mg/dl)	33.06	-0.309	0.1510
Red cells (mg/dl)	10.70	-0.341	0.1120
Skin condition score	3.18	-0.079	0.7190
Number of reasons for insertion	1.74	-0.213	0.3290
Number of pain relief methods	2.43	-0.242	0.2650
Catheter insertion length (cm)	14.30	-0.049	0.8240
Catheter exteriorization length (cm)	8.11	0.182	0.4060
PICC day use (days)	10.96	0.909	< 0.0010
Infusion type			
Continuous infusion	4.2	0.385	0.0700‡
Intermittent infusion	8.5	0.828	<0.0010‡
No infusion	3.6	0.289	0.1930‡
Intravenous therapy type			
Polytherapy	10.10	0.798	<0.0010
Monotherapy	3.18	0.160	0.4650
Infant allocation			
Intensive care	9.75	0.544	0.0070‡
Semi-intensive care	4.56	0.264	0.2240‡
Intermediate care	6.18	-0.187	0.3920‡
Accommodation			
Incubator	9.58	0.598	0.0030
Common crib	6.50	0.084	0.7020
Average incubator temperature (°C)	30.76	-0.032	0.8960
Average baby temperature (°C)	36.70	0.412	0.0510
Insulation (days)	6.67	0.231	0.2890
Bath type			
Bed	7.53	0.553	0.0060
Immersion	7.53	0.074	0.7360
Participation of guardians	7.06	0.143	0.5140

Caption: PICC - Peripherally Inserted Central Catheter; *Spearman's correlation test; ‡Kruskal-Wallis test.

Considering the 41 dressing changes, dwell time was one day for six infants (14.6%), two days for seven infants (17.1%), three days for seven infants (17.1%), four days for 11 infants (26.8%), five days for six infants (14.6%) and six, eight, ten and 11 days for only one infant (2.4%). Thus, the most prolonged stay of a peripherally inserted central catheter dressing was 11 days, presented by only one infant (2.4%), and the most prolonged mean stay of four days was the most frequent, with 11 infants (26.8%).

Table 4. Association between the average duration of dressing maintenance and the reason for removal, complications, sites or suspected infection, and peripherally inserted central catheter displacement (n=23).

Variables	Total n(%)	Longer dressing maintenance			
		Mean	SD	95%CI	p-value
Reason for PICC withdrawal					
End of treatment	14(60.9)	3.4	2.243	3.5-5.5	0.3079‡
Catheter complications	7(30.5)	3.1	4.018	2.0-11.0	
Local complications	1(4.3)	10.0	-	10.0-10.0	
Suspected catheter-related infection	1(4.3)	5.0	-	5.0-5.0	
Catheter complications or suspected infection					
No	14(60.9)	3.4	2.243	3.5-5.5	0.8220§
Yes	9(39.1)	4.1	4.167	3.5-10.0	
Catheter displacement					
No	17(73.9)	3.1	3.162	3.0-7.0	<0.0010§
Yes	6(26.1)	5.5	8.000	5.0-5.0	

Caption: DP - standard deviation; PICC - Peripherally Inserted Central Catheter; ‡Kruskal-Wallis test; §Wilcoxon-Mann-Whitney test.

Correlations between the number of peripherally inserted central catheter exchanges and sociodemographic and clinical characteristics

Full-term birth was associated with a longer mean dressing dwell time (Table 2), and as the number of hospitalization days increased, the dressing tended to remain in place for a longer period ($p = 0.018$) (Table 3).

Peripherally inserted central catheter use days, intermittent infusion, polytherapy regimen, allocation to intensive care, accommodation in an incubator, and bed bath had a positive correlation with dressing time ($p < 0.05$) (Table 3).

Regarding the association between the mean dressing dwell time and the reason for removing peripherally inserted central catheter, catheter complications, site or suspected infection, and catheter displacement, there was a statistically significant correlation only with PICC displacement ($p < 0.05$) (Table 4).

Discussion

This study showed a low mean length of stay and many infant peripherally inserted central catheter dressing changes. In addition, the longest permanence time of the peripherally inserted central catheter was

correlated with full-term birth, greater catheter gauge, use of analgesia for catheter insertion, more extended hospital stay, more days of catheter use, intermittent infusion use, polytherapy, allocation to intensive care, incubator use, bed bath, and catheter displacement.

The average of 3.7 days to change the peripherally inserted central catheter dressing was lower than most studies on the subject,^(4,6,7,14, 16,18,19) and up to 5 dressing changes were observed during peripherally inserted central catheter use. In addition, a study found that performing more than two dressing changes was associated with the prevalence of adverse events.⁽¹⁴⁾

A study that compared peripherally inserted central catheter and other types of central lines regarding the need for dressing change found that infants who used peripherally inserted central catheter had two times less need for transparent dressing change, as well as fewer insertion attempts, shorter length of hospital stay and fewer general complications.⁽¹¹⁾ Furthermore, a controlled clinical trial⁽¹²⁾ determined the appropriate frequency of central venous catheter dressing change in 162 preterm infants in catheter-related bloodstream infection (BCSI) prevention every week regularly (WR) vs. not regularly (NR). The results showed 5.8 days for the WR group and 9.3 days for the NR values, much higher than those in the present research.

Studies involving central catheter use do not always report the gauge of the catheter used in infants, but gauges of 2.0 French or smaller are frequent.^(10,12,19) Attempts with larger gauges were performed, showing no additional damage in this population⁷. However, the findings of this study showed that using 3 French catheters was associated with longer dressing duration. This finding may be related to the difficulty in fixing the distal portion of smaller-gauge catheters, which may lead to accidental catheter loss due to rupture, a more significant number of dressing changes,⁽²⁰⁾ or loss of adhesion to the edges of the dressing throughout its use, as seen in adults.⁽²¹⁾

Using analgesia at catheter insertion may have contributed to longer dressing dwell time, as it reduced the baby's agitation caused by pain and possible venous injuries and bleeding, given that dirt in insertion is one of the main reasons for changing a dressing. So, the adoption of comfort measures in the present research sample was more frequent than

observed in other studies. A Brazilian study, which assessed 254 PICC insertions, identified analgesia in only 34.6% of infants, showing the need to implement protocols and guidelines in health institutions for adequate pain management in infants.⁽²⁾

Although studies have reported a relationship between PICC use and bloodstream infection occurrence,^(6,18,22) in this study, there was no infectious outcome related to peripherally inserted central catheter.

The positive correlation between allocation to intensive care, incubator use, polytherapy, and intermittent infusions with dressing dwell time suggests that the higher frequency of nursing care present in these situations may be related to the higher mean dwell time.

The peripherally inserted central catheter dressing humidity is an extrinsic factor that interferes with infants' skin integrity.^(23,24) Therefore, protecting the dressing in other types of bath, such as immersion, when using the device⁽⁹⁾ is recommended. Then, a bed bath is a protective factor that can increase peripherally inserted central catheter dressing dwell time to be considered in care planning.

Several aspects can contribute to catheter displacements, such as loss of dressing integrity, quality of dressing used, infants' skin condition, infants' younger age, and less parental education and professional skill.⁽¹¹⁾ This research showed that displacement occurred when a dressing stayed longer, possibly due to failures in a daily inspection or even when performing the dressing, either by infants' agitation when changing the dressing or by the dressing removal technique. Therefore, it can impact non-elective catheter removal due to the non-central positioning, which is considered a risk factor for complications.^(4,6,14)

Different interventions can prevent peripherally inserted central catheter displacement, such as the use of silicone-based products that can help remove the dressing,⁽²⁵⁾ the use of stabilizing tapes or wound closure strips on the catheter shaft,⁽²⁶⁾ especially in dressing changes, or the use of elastic meshes or secondary non-sterile fixations throughout the day.^(27,28)

Knowledge of the factors associated with peripherally inserted central catheter dressing dwell time may contribute to planning nursing care for infants undergoing peripherally inserted central catheter and

reducing complications. Furthermore, they may be helpful for future epidemiological and clinical studies that support professional practice.

The study had some limitations such as it was conducted at a single center, did not assess the technique of changing the peripherally inserted central catheter dressing (transparent film removal and application), used a single brand of transparent film, and had a small sample, with only 23 children.

These associations may help indicate which infants should be prioritized in nursing care. Thus, preterm infants, with smaller peripherally inserted central catheter gauge, with continuous infusions, in monotherapy, who are not in intensive or semi-intensive care, who are in a standard crib and with immersion bath because they had a lower mean peripherally inserted central catheter dressing dwell time were the most exposed to complications resulting from frequent changes.

Finally, it is essential to highlight that the findings regarding analgesia use with longer dressing dwell time suggest that this aspect should be considered in the construction and implementation of peripherally inserted central catheter insertion protocols.

Conclusion

This study showed that infants' mean peripherally inserted central catheter dressing dwell time varied widely. The variables associated with longer peripherally inserted central catheter dressing dwell time were infants with full-term gestational age, more extended hospital stay, longer catheter gauge, analgesia use in catheter insertion, intermittent infusion use, polytherapy, allocation to intensive care, incubator use, bed bath, and catheter displacement.

Author Contributions

Negri DC, Toriyama ATM, Veríssimo MDLOR, and Ramos MCM declare that they contributed to the study conception, data collection, analysis and interpretation of data, manuscript writing, critical review of the intellectual content, and approval of the final version to be published.

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