ALFREDO PINTO UNIRIO SCHOOL OF NURSING
FEDERAL UNIVERSITY OF THE STATE OF RIO DE JANEIRO
RECTIS - ISSN: 2675-4932. V4/2023
http://dx.doi/10.9789/2675-4932.rectis.v4.12142
Standard Operational Procedure

Simple hand hygiene performed by health professionals during hemodialysis sessions

Higienização simples das mãos realizada por profissionais de saúde durante as sessões de hemodiálise

Higiene de manos sencilla realizada por profesionales sanitarios durante las sesiones de hemodiálises

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RESUMO

Objetivos: analisar as práticas de prevenção e controle realizadas pelos profissionais de saúde nas sessões de hemodiálise e identificar os procedimentos que estão sendo realizados na técnica de higienização das mãos; verificar a adesão da equipe de enfermagem do serviço de diálise na desinfecção do dispositivo valvulado (TEGO). **Método:** pesquisa de revisão de literatura realizada por meio dos principais bancos de dados online de pesquisas indexadas. A pesquisa foi realizada para abordar a importância da higienização simples das mãos nas atividades do Programa Saúde na Escola. **Resultados:** a prevenção de eventos adversos na população de pacientes internados em diálise representa desafios significativos. A bacteremia associada a linhas ou enxertos são infecções comuns associadas à saúde que levam a resultados adversos para os pacientes. **Conclusão:** os profissionais reconhecem a importância das medidas de prevenção de infecção para melhoria da qualidade da assistência.

DESCRITORES: Controle de infecção hospitalar; Hemodiálise; Cateter.

ABSTRACT

Objectives: to analyze the prevention and control practices performed by health professional in hemodialysis sessions and identify the procedures being performed in the hand hygiene technique; to verify the adhesion of the nursing team of the dialysis servisse in the adhesion of the nursing team of the dialysis servisse in the disinfection of the valved device (TEGO). **Method:** literature review research carried out through the main online databases of indexed research. The research was carried out to address the importance of simple hand hygiene in the activities of the Health at School Program. **Results:** the prevention of adverse events in the

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http://dx.doi/10.9789/2675-4932.rectis.v4.12142
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inpatient dialysis population representes significant challenges. Line or graft-associated bacteremia are common health-associated infections that lead to adverse patient outcomes. **Conclusion:** professionals recognize the importance of infection prevention measures to improve the quality of care.
DESCRIPTORS: Hospital infection control; Hemodialysis; Catheter.

RESUMEN

Objetivos: analizar las prácticas de prevención y control realizadas por los profesionales de la salud en las sesiones de hemodiálises e identificar los procedimientos que se realizan en la técnica de higiene de manos; verificar la adhesión del equipo de enfermería del servicio de diálisis en la desinfección del dispositivo valvulado (TEGO). **Método:** investigación de revisión bibliográfica realizada a través de las principales bases de datos en línea de investigación indexada. La investigación se realizo para abordar la importancia de la higiene sencilla de las manos en las actividades del Programa Salud en la Escuela. **Resultados:** la prevención de eventos adversos en la población de pacientes hospitalizados en diálisis representa desafios importantes. La bacteriemia asociada con la línea o el injerto son infecciones comunes asociadas a la salud que conducen a resultados adversos para los pacientes. **Conclusión:** los profesionales reconocen la importancia de las medidas de prevención de infecciones para mejorar la calidad de la atención.
DESCRIPTORES: Control de infecciones hospitalarias; Hemodiálisis; Catéter.

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INTRODUCTION

Simple Hand Sanitization (SHS) aims to remove the transient microbiota that colonize the surface layers of the skin, as well as sweat, oil, and dead cells, removing dirt that is conducive to the permanence and proliferation of microorganisms.[1-3]

The recommended SHS description for healthcare workers consists of applying/rubbing the hand surfaces with liquid soap, with an expected duration of the procedure between 40 and 60 seconds. Rinse hands, removing soap residue. Avoid direct contact of soapy hands with the faucet. Dry with disposable paper towels. It is recognized worldwide as an important procedure for the prevention of healthcare-associated infections and is considered an essential factor for infection prevention and control within healthcare services.[1-3]

For patients with Chronic Renal Insufficiency, infections represent the second cause of morbidity and mortality, and the main cause of hospital admission of dialysis patients in Brazil. The major causative agents of infection in renal patients are microorganisms of the bacterial flora of their own skin, which eventually contaminate equipment and solutions.[1-3]

In hemodialysis services, patients and employees are subject to infection. Therefore, the concern with its prevention and control is a constant focus of professionals and managers who must follow the protocols established in the RDC nº 154, which is the Technical Regulation for the Operation of Dialysis Services published by the Ministry of Health. In its text there is a determination that all dialysis centers program a Program for the Control and Prevention of Infections and Adverse Events, in accordance with the legislation of the Hospital Infection Control Program of the Ministry of Health, and under the responsibility of the physician or nurse of the dialysis service.[4]

Some factors are important to be observed by the team according to the routines established for infection control and prevention and among them are

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infection prevention techniques such as hand washing and use of Personal Protective Equipment (PPE), highlighting the importance of this project to evaluate how this technique has been performed in the hemodialysis unit.

The object of the research is to characterize the Standard Operating Procedure described in the literature on Nursing Care for Clients with Incapacity to Clear Toxins and Fluids from the Body to Establish Water-Electrolyte Balance, and to promote Nursing Care for Renal Clients with Hypotension and Hypertension on Dialysis.

The research is justified because the practice of hand hygiene and the use of Personal Protective Equipment (PPE) are protective barriers for the patient and for the healthcare professional when handling equipment, which avoid the dissemination of microorganisms related to the cleaning and disinfection of the valved device (TEGO) and not using adornments, such as bracelets, rings, earrings and laces. Care practices are health promotion strategies.

The objectives are to analyze the prevention and control practices performed by health professionals in hemodialysis sessions and identify the procedures that are being performed in the hand hygiene technique; to verify the adherence of the dialysis service nursing team in the disinfection of the valved device (TEGO).

METHOD

Literature review research carried out through the main online databases of indexed research, books, and current legislation. In much of the analysis of the results found, authors Malagutti and Roehrs guided the preparation of the integrative literature review study.

Integrative review whose methodological approach allows the analysis of relevant research that provides support for decision making and the improvement of clinical practice, enabling the synthesis of the state of knowledge of a given subject. In an organized and systematic manner, the integrative review aims to gather and synthesize the results found in relevant

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research by means of guiding questions, contributing to the deepening of knowledge of the proposed theme from previous studies.[5]

This research began in the elaboration of the Standard Operating Procedure of Nursing Care to the Client with Incapacity to Clear Toxins and Liquids from the Body to Establish the Hydro-electrolyte Balance performed in the Peritoneal Dialysis Sector; Nursing Care to the Renal Client with Hypotension and Hypertension on Dialysis, and to obtain the title of Specialist in Nursing Residency Molds: Clinical and General Surgical, internship load in the Nephrology Service of the Federal Hospital Servers of the State of Rio de Janeiro, Ministry of Health.

The research was conducted and completed to address the importance of simple hand hygiene in the activities of the Programa Saúde na Escola e Crescer Saudável (PSE) and the promotion of care in the attention to patients with Systemic Arterial Hypertension and Diabetes Mellitus (HIPERDIA) in the Municipality of Itatiaia, in the state of Rio de Janeiro, Brazil. The search period comprised the years 2020 and 2021, which were marked by the Public Health Emergency of International Importance COVID-19 and the National Vaccination Campaign against COVID-19.

And it was based on the choice of key words selecting the terms inserted in the Descriptors in Health Sciences (Decs), using the following descriptors: "hospital infection control", "hemodialysis" and "catheter". The databases Latin American and Caribbean Literature on Health Sciences (Lilacs) and Medical Literature Analysis and Retrieval System Online (MEDLINE) were consulted. 61 articles were found. The information was gathered in the main subject "Catheter-related infections" and "Central Venous Catheterization".

The following inclusion criteria were applied for the selection: articles published in the last 10 years, in Portuguese, English and Spanish languages. The association of nursing interventions to the type of study

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"controlled clinical trial", "incidence study", "screening study", "risk factors", "etiology study", and "prognostic study" respectively was used, 13, 11, 10, 3, 1, 1 published articles.

Of the results found, five selected articles were read and a description form was used, containing the following information: title, authors, main objective, type of methodology, sample, subjects, main results, and conclusions. Finally, a critical analysis was performed, which corresponds to the evaluation of the studies and interpretation of the results. This research respects the Resolution n°580, of March 22, 2018 that disposes the ethical specificities of research of strategic interest for the Unified Health System.[6]

RESULTS AND DISCUSSION

Preventing adverse events in the dialysis inpatient population poses significant challenges. Line- or graft-associated bacteremia are common healthcare-associated infections that lead to adverse outcomes. Dialysis patients pose a risk of infection due to the need for multiple attempts at line access, fistula functionality; additional complications and more frequent hospitalizations, costs, morbidity and mortality.[7-9]

Increasing proportions of central line-associated bloodstream infections are observed in outpatient settings. Many are due to hemodialysis catheters. These infections are associated with morbidity, mortality, and excessive healthcare costs. Patients receiving dialysis through a catheter have a higher chance of being hospitalized for infections and complications than patients on dialysis with grafts or fistulas.[7-9]

The use of 70% alcohol and 3.15% chlorhexidine gluconate before accessing the valved central line device helps to reduce central line-associated bloodstream infection events.[10] Prevention measures include minimizing the use of hemodialysis catheters, use of preventive measures for line insertion and maintenance. Catheter-related complications occurred most

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frequently during the first 90 days of catheter placement.[9-11]

Health products can be used more than once, be reprocessed, under safe conditions, a practice that gives them a longer life and use for as long as they are effective and functional; standards regulate this continued use. Health products that can be processed are those that allow repeated cleaning, disinfection, or sterilization processes, and can therefore be reused, provided they comply with current regulations.[12-14]

The regulations also establish the criteria for prohibiting the processing of a health product, which basically depends on two conditions: the first is whether the material is on the list published by RE/Anvisa 2605/2006, which establishes the list of medical products classified as single use, whose reprocessing is prohibited.[15]

In this case, there is no prohibition on reprocessing, provided the services that intend to perform this activity follow the RE/Anvisa 2606/2006, on the development, validation and implementation of protocols for reprocessing medical products, and the RDC/Anvisa No. 15/2012, which provides on good practice requirements for the processing of health products.[14-15]

The second condition is when the product labeling has the words "Reprocessing forbidden", as established by RDC/Anvisa No. 156/2006, which provides for the registration, labeling and reprocessing of medical products.[11-12] The central venous catheters (CVC) represent a major advance in diagnosis and therapy in health, since clinical and surgical procedures could be developed from this technology and, for some patients, it is a vital life resource.[16-18]

Catheters are classified by several criteria, such as: the length of stay, less than 30 days or long, more than 30 days; the route they travel from the skin to the vessel, non-tunneled or tunneled; and by some special characteristics such as presence of cuff, heparin impregnation, antibiotics or antiseptics; and, as for the number of lumens.[16-18]

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The material used for confection can determine its permanence time. Silicone has greater thermostability, high resistance to kinking, low thrombus formation, low bacterial adherence, high biocompatibility, and long permanence. Polyurethane has greater rigidity, chemical resistance, moldability, biostability, strength, and low thrombus formation.[16-18]

Stability of the catheter means to fix it adequately. The catheter fixation in the insertion area is fundamental not only to ensure its permanence, but also to avoid contamination; thus, it is important to maintain adequate fixation and observe possible exteriorization.[16-18]

Regular catheter washing at pre-established intervals with anticoagulants or 0.9% isotonic saline solution makes it possible to maintain permeability and prevent drug incompatibility. The minimum volume of solution for flushing should be at least twice the volume of the catheter capacity, in reference to the priming, including the body and connector. Flushing with 0.9% isotonic saline solution is indicated for valved catheters every 12 hours, and flushing with positive pressure in non-valved catheters with heparin solution.[16-18]

Catheter occlusion can occur by mechanical, it is caused by kinking or compression of the device lumen, which usually results in migration of the tip of the device into a smaller caliber vessel, there is a compression between the clavicle and the first rib.[16,18] Thrombolytic originates from clot formation within the catheter due to trauma to the vessel wall, stenosis, or in cases of hypercoagulopathies caused by cancer and diabetes.[19-20] Nonthrombolytic results from drug incompatibility or parenteral nutrition, the consequence of which is intraluminal crystallization.[16,18]

The dressings should promote protection of the catheter insertion site, and can be performed with gauze and adhesive tape or with transparent semipermeable film. Chlorhexidine 0.5% is used as antiseptic solution, but in patients up to two months

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old, Polyvinyl Pyrrolidone Iodine (PVPI) 1% is used due to the risk of chlorhexidine toxicity in this age group.[16-18]

The ethyl and isopropyl alcohol cause cell death by denaturation of cell protein, with effective action beginning in 15 seconds, has excellent and rapid spectrum of action, low cost, but has no residual effect, is volatile and loses its action in the presence of organic matter; it is still a strong indication for rapid procedures, antisepsis of the skin, in the insertion of peripheral catheters and peripheral blood samples collection.[16-18]

The 0.5 to 2% alcoholic chlorhexidine gluconate starts its action in 15 seconds, causes cell death by breaking the cell wall; it has an excellent spectrum of action against Gram-positive and Gram-negative microorganisms, fungi and viruses; its best characteristic is the 6 to 8-hour residual effect, which represents safety in longer procedures.[16-18]

Iodine, on the other hand, has an immediate onset of action by oxidation and replacement of cell content by free iodine, leading to cell death; it is efficient against Gram-positive and negative microorganisms, but regular against fungi, mycobacteria, and viruses, has little residual effect, and is also inactive in the presence of organic material; it can cause irritation, allergies, and burns. To reduce the impact of these risks, the iodophors can be used, which do not have such a rapid action, from 1 to 2 minutes, and a regular residual effect, from 2 to 4 hours, causing less irritation and toxicity.[16-18]

Equipole used to administer blood and blood products or emulsions that combine amino acids and glucose in a three-in-one mixture, or infused separately, should be changed within 24 hours of starting the infusion. If the infused solution contains only dextrose and amino acids, the line can be changed every 72 hours. Change the IV line used to administer propofol infusion every 6 to 12 hours, following the manufacturer's recommendations.[16-18]

When administering blood products and blood products, change the IV line with

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each infused bag. The caps must be changed after each use. Disinfect the inlets with 70% alcohol before and after connecting the IV line and syringes. Disinfect the intravenous injection ports with 70% alcohol or an iodophor before accessing the system.[16-19]

Regarding the entry of clients for dialysis treatment, the Sociedade Brasileira de Nefrologia (SBN) estimates that there are approximately 20,000 new cases per million inhabitants, with an annual incidence around 100 new cases per million inhabitants, although only 60 new patients start dialysis treatment, due to lack of diagnosis or incorrect treatment.

References in epidemiological studies indicate that in Brazil there are approximately 65 thousand patients undergoing renal replacement therapy, most of whom undergo hemodialysis.[16]

For the performance of hemodialysis, a vascular access is required, which may be temporary or permanent. The percutaneous insertion of a catheter in a large-caliber vein, jugular, femoral or subclavian; called a double lumen catheter, provides temporary access. A permanent access is obtained by making an arteriovenous fistula or by inserting a double lumen silicone catheter with cuff, the Perm Cath, or a pair of single lumen catheters with cuff, Tesio catheter, into an internal jugular vein.[16,18-20]

Semi-implanted catheters are made of siliconized rubber and coated with a layer of Teflon to ensure greater strength and durability. Its proximal end must remain close to the right atrium, in a vessel of high blood flow, cephalic, jugular or subclavian vein, and its distal portion is exteriorized through a small incision, usually located at the third or fourth intercostal vertebrae, right and left. The preferred sites for venous insertion are right jugular, femoral, left jugular and, as a last choice, subclavian, preferably on the side of the dominant arm.[16-18]

For the implantation, a surgical incision is made near the vessel of choice and the surgeon creates a tunnel in the subcutaneous tissue, through which the

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catheter will pass. In this tunneled section, the catheter has a Dacron cuff, a kind of foam around which the body creates a fibrous tissue that helps in the fixation and in the prevention of ascending contamination coming from the catheter exit site.[16-18]

The first semi-implanted catheter was devised by Broviac in 1979 and was intended for the administration of prolonged parenteral nutrition. A few years later, Hickman created a modified, larger Broviac, ideal for patients undergoing bone marrow transplantation, and this catheter was named after him. When inserted, rigorous antisepsis of the catheter insertion area is performed with degerming chlorhexidine at 2%, followed by alcohol at 0.5%.[16-18]

This procedure, performed exclusively by physicians, preferably by the Seldinger technique, the catheter is inserted over a guide wire located inside the vessel by the light of the puncture needle, provides access to the central venous circulation, allowing the infusion of different drugs and solutions, parenteral nutrition, in addition to measuring hemodynamic variables that assist in guiding therapeutic procedures; the central venous pressure and venous oxygen saturation.[16-18]

Peripheral catheters are used in short-term therapy and are made of Teflon, polyurethane, polyvinylchloride, and polyethylene. Common complications are phlebitis, infiltration, and extravasation, which directly interfere with the catheter's length of stay. The peripheral catheter installed in an emergency situation and when aseptic technique has not been ensured should be changed within 24 hours, in case of suspected contamination, malfunction or discontinuity of therapy. It is recommended that the peripheral catheter be changed within 72 hours when made of Teflon and 96 hours when made of polyurethane.[16-18]

The permanent access of choice for hemodialysis is the arteriovenous fistula, which consists of the subcutaneous anastomosis of a radial artery with the

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cephalic vein at forearm level. Approximately four to six weeks after the procedure, the venous branch of the fistula dilates and its walls thicken, allowing repeated insertion of dialysis needles. The fistula is usually performed in the non-dominant arm to limit the consequences of any functional disability that may occur and to allow for self-dialysis. For the use of the fistula, it is necessary to wait for its maturation, which lasts about 2 to 3 weeks.[16-19]

It is important to highlight that, even with the increasing sophistication of hemodialysis machines making the procedure safe, in 30% of the sessions some type of complication may occur. These complications include: hypotension, cramps, nausea and vomiting, headache, chest pain, back pain, allergic reactions, cardiac arrhythmia, gas embolism, gastrointestinal bleeding, metabolic problems, convulsions, muscle spasms, insomnia, restlessness, dementia, infections, pneumothorax or hemothorax, ischemia or edema of the hand, and anemia.[16,18]

To reverse hypotension, for example, the ultrafiltration is often decreased and physiological saline, plasma, and hypertonic agents are administered, and if necessary, the patient should be placed in the Trendelenburg position and nasal oxygen administered. For nausea and vomiting, treatment is suggested to correct the cause, and if symptoms persist, antiemetics should be administered. Headache is treated by administering analgesics intravenously and removing the cause. Most often, they are infused in bolus through an existing intravenous infusion route or a closed, heparinized access.[16,18]

In cases of allergic reactions in the patient, antihistamines, adrenaline, corticoids, and ventilatory support may be used, according to the intensity of the symptoms, and as prescribed by the medical professional. Another reason that leads chronic renal patients submitted to hemodialysis to need intravenous

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medications in the dialysis unit is the infection at the site of vascular access, requiring the administration of antimicrobials.[16,18,21]

The removal of drugs by dialysis depends on the blood flow imposed for volume withdrawal; the surface area of the membrane and the type of drug. Thus, when administering an antimicrobial to the chronic renal patient, it is necessary to characterize whether it is removed on dialysis. Generally, the antimicrobials are diluted in 100 ml of SF 0.9% due to the hydric restriction to which the patient is submitted.[16,18,21]

The drugs needed to prevent or treat anemia in the chronic renal failure patients undergoing hemodialysis that may be used during or after the session are Recombinant Human Erythropoietin and intravenous iron. Intravenous iron can be used shortly before the end of the hemodialysis session, but erythropoietin is usually administered soon after.[16,22-24]

Iron administration in patients undergoing hemodialysis is necessary because of the continued blood loss associated with the procedures, and thus to treat iron deficiency anemia in conjunction with identification and correction of the causes. Iron replacement can be done orally, subcutaneously, intramuscularly, and intravenously. Sometimes, iron absorption from the gastrointestinal tract is insufficient to meet the patient's needs, especially in those with chronic losses or chronic kidney disease.[16,22-24]

In these patients, intravenous iron replacement should be done at the appropriate dilution, exclusively in 0.9% saline solution (SS), at a slower rate than the dose to be administered, ranging from 10 g in 100 ml of SS in 15 minutes to 300 g in 300 ml of SS in 90 minutes. In practice, for individuals on hemodialysis, a dose of 40 to 50 mg is sufficient and safe to maintain the iron stores of these patients.[16,22-24]

The percentage of hydrogen (pH) in the body signals whether a solution is acidic,

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neutral or alkaline. The physiological blood pH is around 7.35 to 7.45, any variation in pH may cause irritation or endothelial damage, so it is recommended to slow down the time of administration, since the pH of the solution is gradually corrected by blood buffering; when fluids are administered at a fast infusion rate, there is an increase in venous pressure, which can lead to fluid accumulation in the lungs and rales. Elderly patients with kidney and cardiovascular problems are most at risk. Glucose-based solutions with a pH between 4.5 - 5.5 should be used for acidic drugs, physiological saline solutions with a pH 6.8 should be used for alkaline solutions.[16,18]

It is noteworthy to mention that once renal failure starts, the deterioration is progressive and leads to Chronic Renal Failure in a variable period of time. Besides the renal adaptation mechanisms themselves, other factors may contribute to the worsening of residual renal function, such as hypertension, urinary tract infections, obstruction, and the use of nephrotoxic drugs. The reduction in function of the remaining nephrons leads to systemic hypertension, proteinuria, glomerular sclerosis, and progressive renal failure. The treatment will depend on the evolution of the disease, and initially it can be conservative, by means of drug and dietary therapy.[16,18]

Finally, for the prevention of infections in the dialysis unit, training and education of health professionals, as well as patients, are necessary. Therefore, standard precautions are recommended as the primary strategy to prevent transmission of health care-related infections between patients and professionals. They should be used in the care provided: hand hygiene before and after contact; use of gloves, masks, goggles and aprons when there is risk of contact with biological material; care with perforating objects; environmental cleanliness; adequate processing of materials and equipment; and immunization of health professionals.[17-18]

CONCLUSION

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It was concluded that although professionals perform hand hygiene, they are unaware of the correct technique for hand hygiene according to the recommendations of the World Health Organization for patient safety. Teams show that there is no alcoholic chlorhexidine in the dialysis sectors as a standard antiseptic product and hand hygiene as a recommended conduct. The professionals recognize the importance of infection prevention measures to improve the quality of care.

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Received: 2022/09/19
Accepted: 2022/10/15
Published online: 2023/01/26
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