



## Multidisciplinary health team in control of risk factors for colonization and infection caused by MRSA in hemodialysis

### Equipe multidisciplinar de saúde no controle dos fatores de risco para colonização e infecção causadas por MRSA na hemodiálise

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#### ABSTRACT

The survey herein presented, describes facts about hospital infections related to hemodialysis, in view of the role of health care professionals in the control and prevention of these infections. Measures to prevent and control the spread of infection within the hospital units or sectors that focus on patients requiring dialysis were investigated. The work is based on references that address infection prevention and measures that professionals should take to do a good patient care hemodialysis, especially in the handling of the dialysis catheter; this is a very important port of entry for microorganisms. Treatment of chronic renal failure is based on hemodialysis and requires specific care from professionals that must have expertise in their preventive patient care, thereby avoiding infections.

**Keywords:** infection, prevention, health care professionals, hemodialysis, catheter

#### RESUMO

Este trabalho descreve fatos sobre infecções hospitalares relacionadas à hemodiálise, tendo em vista o papel dos profissionais de saúde na prevenção e controle dessas infecções. Medidas de prevenção e controle da propagação de infecções nas unidades hospitalares ou de setores que concentram pacientes que necessitam de diálise foram investigadas. O trabalho é baseado em referências que abordam a prevenção de infecções e medidas que os profissionais devem seguir para tornar a prática da hemodiálise segura e eficaz. O tratamento da insuficiência renal crônica é baseado em hemodiálise e requer cuidados específicos por parte dos profissionais da saúde que devem ter experiência na assistência ao paciente, evitando assim infecções.

**Palavras-chave:** infecção, prevenção, profissionais da saúde, hemodiálise, cateter

#### INTRODUÇÃO

Chronic renal failure is a clinical situation in which the patient depends on a treatment for recovery or replacement of renal function, mostly by dialysis. (Mangini et al,2005).

When hospitalized patients can suffer from infections and the procedures of dialysis are important factors for morbidity and mortality of patients. (Cais et al, 2009).

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*Staphylococcus aureus* is the leading cause of infection among patients on end stage renal diseases (ESRD). The annual incidence of *S. aureus* colonization varies 6-27%, including endocarditis, osteomyelitis and metastatic abscesses. Patients with ESRD who acquire bacteremia by *S. aureus*, have a higher risk of death than patients in whom bacteremia is attributable to other organisms. (Yanhong Li, Y. 2008)

As for other types of infections, the most common microorganisms causing dialysis related infections are becoming resistant to antibiotics. The greatest risk of infection in this population is partly caused by impaired host immunity (Leone et al, 2010). According to Chown (2010) the formation of the matrix of the biofilm on the inner surface of venous catheters may be responsible for bacteremia through catheters.

The methods of treatment of kidney disease require specific nursing care to avoid a possible infection in the patient, so the nurse should be trained to perform the correct techniques and advocating the prevention of hospital infection in chronic renal patients (Couto et al. 2003).

Hemodialysis is the most common method of dialysis. Performed on patients who are acutely ill and in need of dialysis for short-term (days and weeks), and is also used for patients with ESRD (end stage renal disease) that require a long treatment or even permanent. For patients with chronic renal failure, hemodialysis prevents death, but does not cure kidney disease and do not compensate for the loss of endocrine and metabolic activities of the kidneys. (Smeltzer, 2009)

Central venous catheterization (CVC) is a reliable option in clinical situations that require immediate access to the circulation, as in patients requiring hemodialysis. Different mechanisms have been proposed in order to determine the source of micro-organisms that colonize CVCs bringing risks to patients. Studies have focused mainly on: the patient's skin around the insertion site, colonization of the catheter, contamination of the catheter at the time of insertion, among others. (Grothe et al, 2010)

Hospitalization in the previous year, the prolonged dialysis nursing, home care, and living in a nursing home increases the risk for MRSA nasal carriage. (Barbier, 2010)

The objectives of this study are to demonstrate the importance of Multidisciplinary health team in the control of infections related to hemodialysis and to identify risk factors for the occurrence of these infections.

**METHODOLOGY**

Was formulated a qualitative research approach exploratory in nature and literature, according to Minayo (1996).

In order to build the research, consultation was conducted through the Virtual Health Library - VHL - specifically the basis of LILACS and BDNF SCIELO, the descriptors used were: infection, hospital infection-related venous access and hospital infections related to hemodialysis. Thus, the intention of organizing the material collected, work began selecting items according to the descriptors elements (Table 1).

**RESULTS AND DISCUSSION**

Infection is a major cause of morbidity and mortality patients undergoing hemodialysis. Colonization by *S. aureus* is associated with a fourfold increased risk of infection in the bloodstream (Liang Lu et al, 2008). *S. aureus* produce enzymes and toxins. Proteases, lipases, nucleases, collagenase and tissue components that can be converted into nutrients, facilitating the invasion and bacterial growth (Barreti, 2009).

Table 1. Descriptors used to build the research. Consultation was conducted through the Virtual Health Library (VHL).

DESCRIPTORS	DATABASE – BVS			
	SCIELO	BDNF	LILACS	TOTAL
Nosocomial infection	129	307	2602	3145
Nosocomial infection related to venous access	2	1	3	6
Nosocomial infection related to hemodialysis	1	2	9	12

Hospitalization in the previous year, the prolonged dialysis nursing, home care, and living in a nursing home increases the risk of MRSA nasal carriage (Barbier, 2010). Vascular access can be a risk factor for colonization and infection by staphylococcus aureus (Vandecasteele et al, 2009). Central venous catheterization is a technique required for the temporary treatment for hemodialysis, achieving results quickly, but offers a high risk of infection with bacteremia (Barbosa, 1998). Morquecho et al (2000) discusses the prevalence of infection in central venous catheter and evidences the need for hygiene, catheter care and manipulation with aseptic technique to reduce infection. Patients who use hemodialysis are hospitalized more frequently, and have been more frequently linked to high infection rates (Leone et al, 2010).

According to Pimentel (2009), awareness education provided by the nurse encourages the development of client and professionals as a whole, contributing to a better care of the nursing team led by nurses. The nurse is who must determine the correct usage of each material in accordance with the procedures, the use of PPE (Personal Protective Equipment), educate other professionals about hand washing, to reduce the risk of contamination to the patient and early detection of flaws in the procedures (Lazzarini et al, 2000).

Aseptic techniques should also be adopted by health care professionals in the manipulation of catheters for access, interrupting access whenever there is disruption of the catheter or infection. The performance of physical examination, control of laboratorial exams and avoid blood transfusions in patients, are measures to be taken by multidisciplinary health team (Alonso et al, 2000; Szymanski et al, 2001).

According to Tacconellie et al (2003) the measures that should be taken on the prevention of hemodialysis catheter infection are:

- Monitor the catheter while maintaining a high level of suspicion of infection, mainly at the insertion site;

- Protocols to determine the beginning and end of dialysis;
- Keep the tips of the arterial and venous lines free of contamination. Protect the ends of lines with sterile gauze and alcohol 70%;
- Use aseptic technique for catheter insertion and manipulation, including the use of mask;
- Keep the dressing clean and dry (change at least every hemodialysis to traditional gauze dressings, and every seven days for transparent film dressing) with antiseptic solution of povidone iodine or chlorhexidine;
- The use of povidone iodine ointment or mupirocin at the end of each dialysis appears to reduce the prevalence of infection, especially in the case of patients with nasal *Staphylococcus aureus*.
- Do not use hemodialysis catheters for blood sampling or infusion, except during hemodialysis, or in emergency situations;
- Do not routinely use antibiotics label strategy to prevent infection, only under special conditions (patients with recurrent bacteremia and difficulty of access).

According to Ucuncu (2009) a decrease on rate of infection may result from the elimination of nasal carriage of *S. aureus*. The carrier state is important to prevent infections and control the potential for transmission in the dialysis unit between healthy care workers and their families.

The hemodialysis unit is also the target of nosocomial infections. According to ANVISA (National Agency for Sanitary Vigilance) the personal care of hemodialysis patients is a predominant factor to prevent infections and if the patient is not aware of self-care, there is a relevant risk to the growth of microorganisms at the site of catheter insertion. This fact explains, once again, the importance of continuing education on health care. The professional should know that the insertion site can also interfere with the occurrence of these infections, as mentioned by Mangini (2005) the insertion site appears to interfere with the risk of infection.

Knowing that the process of occurrence of hospital infections in the hemodialysis unit must also have surveillance and prevention, the ANVISA recommended that all hemodialysis services should deploy and implement a program of prevention and control of infection and adverse events (CPIC). The CPIC should be done with the participation of professionals in the hemodialysis service under the responsibility of the physician or nurse.

## CONCLUSIONS

According to the herein presented study, all patients under hemodialysis treatment requires special attention, being monitored by a multidisciplinary team of health care professionals, working for prevention or reduction of risk for colonization or infection, this is a major cause of morbidity and mortality among patients. Low immunity of hemodialysis patients, CVC and lack of attention on performing aseptic techniques are some of the risks for infection. The self-care and proper hygiene of the patient is very important to help reducing the prevalence of infections.

Continuing education of health professionals is of great

importance in the manipulation of the catheter hemodialysis, taking into account the higher frequency of patients in the hospital and an increased level of catheter-associated infections. The study also showed that *S. aureus* infections are of great importance and its prevalence has been increasing among subjects within the hospital environment and at the community. When the subject is colonization and infection in hemodialysis centers, this pathogen is evidently increasing morbidity and mortality of patients. The risk factors can be reduced or eliminated by good practices associated to preventive actions taken by a multidisciplinary health team.

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