

**Nurses' Application of Infection
Control Precautions in Hemodialysis Unit
at El-Mansoura University Children's Hospital**

A Thesis

Submitted to the Faculty of Nursing

University of Alexandria

In partial fulfillment of the Requirements

for the degree

Of

Master of Sciences

In

Pediatric Nursing

By

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Presented by

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تطبيق الممرضات للاحتياجات العامة للتحكم في العدوى في وحدة الغسيل الكلوي
بمستشفى الأطفال الجامعي بالمنصورة

رسالة علمية

مقدمة إلى كلية التمريض – جامعة الإسكندرية
إيفاء جزئيا لشروط الحصول على درجة

الماجستير في العلوم

في

تمريض الأطفال

مقدمة من

جوهرة جاد سليمان إبراهيم

بكالوريوس تمريض

كلية التمريض - جامعة المنصورة

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هذا البحث مقدمة إلى
كلية التمريض
جامعة الإسكندرية
كجزء من شروط
الحصول علي درجة
الماجستير في تمريض الأطفال
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قسم تمريض الأطفال
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Introduction

Chronic renal failure(CRF) is progressive, irreversible deterioration in renal function in which the body ability to maintain metabolic , fluid and electrolyte balance fails, resulting in uremia or azotemia.⁽¹⁾ It result from congenital kidney and urinary tract abnormalities in children less than 5 years of age, and glomerular and hereditary kidney disorders in children 5 to 15 years of age.⁽²⁾ According to the statistical record of El-Mansoura University Children's Hospital 31 patients from age 2 to 18 years were undergoing maintenance dialysis during the year 2005 and this number increased to 54 during the year 2006⁽³⁾while, the incidence of CRF in pediatric population in developed countries is 6-8 per 100.000 per year.⁽⁴⁾

Dialysis and transplantation are the only treatment currently available for children with CRF.^(5,6) Dialysis is the process of separating colloids and crystalline substances in solution by the difference in their rate of diffusion through a semipermeable membrane. The methods of dialysis are peritoneal dialysis, hemodialysis, and hemofiltration.⁽⁷⁾ Hemodialysis is best suited to children who don't have someone in the family is able to perform home peritoneal dialysis and to those who live close to the center.⁽⁸⁾ In Hemodialysis blood is circulated outside the body through artificial membranes that permit a similar passage of water and solutes.⁽⁷⁾ The procedure is usually performed three times per week for 4 to 6 hours , depending on the size of the child.^(8,9)

Factor contributed to infection in children with CRF are numerous. Hemodialysis often requires a link between the dialysis machine and the inter vascular compartment for 10 to 15 hours a week. The combination of frequent needle sticks and carriage of cutaneous staphylococci predisposes hemodialysis

patient to infections at the vascular access site.⁽¹⁰⁾ These patients also have suppression of cell-mediated immunity and reduction in the number and function of lymphocytes and phagocytes that increases the risk of infection.⁽⁶⁾ Bacterial contamination of dialysis equipment has been linked to sepsis⁽¹⁰⁾, and the use of catheters is the most common factor contributing to bacteremia in dialysis patients.^(11,12)

In hemodialysis units contact transmission is the most important route by which pathogens are transmitted. Contact transmission plays a major role in transmission of bloodborne pathogens.^(13,14) Such infections include bacterial and viral infections as hepatitis B and C which result from blood transfusion or lack of adherence to precautions used to prevent the spread of infection.⁽¹⁵⁾ The most common and important route is via the hands, thermometer and other equipment that come into contact with mucous membranes.⁽¹⁴⁾ Contact transmission occurs most commonly when microorganisms from a patient are transferred to the hands of a health-care worker who does not comply with infection control precautions, then touches another patient.⁽¹³⁾

Preventing transmission among chronic hemodialytic patients of bloodborne viruses and pathogenic bacteria from both recognized and unrecognized sources of infection requires implementation of a comprehensive infection control program. The infection control practices recommended for hemodialysis units will reduce opportunities for patient-to-patient transmission of infectious agents, directly or indirectly via contaminated devices, equipment and supplies, environmental surfaces, or hands of personnel. Such practices include additional measures to prevent Hepatitis B virus (HBV) transmission because of the high titer of HBV and its ability to survive on environmental surfaces.⁽¹³⁾

Standard precautions are designed for the care of all patient in hospitals^(1,14,15). Its elements include hand hygiene^(14,16,17), use of barriers (gloves , gown , mask, goggles and face shield^(17,18,19,20), cleaning the hospital environment^(14,20,21) and disinfection or sterilization of supplies and equipment.^(14,18) The purpose of these precautions is to prevent the transmission of organisms from patient to health care providers , from health care provider to patient ,and from patient to another⁽¹⁴⁾. The use of appropriate barrier precaution to reduce the risk of nosocomial infections is essential in caring for children.⁽⁷⁾

The Occupational Safety and Health Administration (OSHA) standard for preventing occupational transmission of blood born pathogens was revised in 2001. This standard mandated that any employer whose employee are potentially exposed to blood from needles and other sharps must implement sharps safety devices wherever feasible^(7,18). Nurses not only have an important role in the prevention of blood –stream infections⁽¹⁾ but also implementation of patient care practices for infection control as well. Nurses should maintain appropriate practices for patients throughout their hospital stay where the nurse is responsible for limiting patient exposure to infection from staff, other patients or equipment. The senior of nursing administrator should develop training programmes for the members of nursing staff about infection control and monitoring its implementation⁽¹⁶⁾.

Aim of the study

The aims of this study are to:

- 1- Assess Nurses' knowledge about standard infection control precaution in hemodialysis unit at El-Mansoura University Children's Hospital
- 2- Assess application of standard infection control precaution among nurses in hemodialysis unit at El-Mansoura University Children's Hospital

MATERIAL AND METHODS

1- MATERIAL

Research desingn:-

It is a descriptive research desingn.

Setting:-

The study will be conducted in hemodialysis unit at El-Mansoura University Children's Hospital.

Subjects:-

The subject of the study will be comprised of:-

A- All Patients attending the hemodialysis unit over a period of four months

B- All nurses providing care for those patients regardless of their age, qualification or years of experience.

Tools:-

Two tools will be used to collect the necessary data.

Tool (1):- Infection Control Precautions Observation Checklist

It will be developed by the researcher to assess the application of standard precautions It will consist of:-

Part I : - Biosocial data of Children such as name, age , sex , education, duration of dialysis and number of dialysis per week.

Part II : - infection control precautions regarding hand washing , gloving , wearing mask , gowning , patient preparation, care of equipment , rubbish and needles disposal, handling linens and nurses' practice in mintenance of hemodialysis unit environment.

Tool (2):- Infection Control Precaution Structured Interview Questionnaire Sheet:

It will be developed by the researcher to assess nurses' knowledge about blood-borne infection and standard infection control precautions in hemodialysis unit.

It will consist of:-

Part I : -

Biosocial data of nurses such as age , level of education , years of experience , position , working hours, attendance of training program about infection control precaution.

Part II: -

Nurses' knowledge about blood-borne diseases and standard infection control precautions in hemodialysis unit.

METHOD

- 1- Official permission will be obtained from the administrator of hemodialysis unit at El-Mansoura University Children's Hospital.
- 2- Tools will be developed after thorough review of literature and tested for their content validity by 5 experts in pediatric nursing and reliability of tools will be done.
- 3- A pilot study will be conducted on 3 patients to evaluate the clarity and applicability of the research tools and necessary modifications will be done.
- 4- A consent will be obtained from each child or his / her parent for his / her participation after explaining the aim of the study.
- 5- Each child will be observed while performing hemodialysis procedure from the initiation of the procedure till its termination to assess the implementation of standard infection control precautions for him or her, each child will be observed for 5 hemodialysis procedure. The observation will be carried out during the morning and afternoon shifts.
- 6- Each nurse will be interviewed individually during the break time to assess her knowledge after her approval to participate in the study through the consent form.