Longevity and infection free survival of permicath

A Thesis

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Mohammad Helal

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List of Abbreviations

Abbr.	Full-term
AVF	Arterio-venous Fistula
AVG	Arterio-venous graft
BFR	Blood Flow Rate
BSI	Blood Stream Infection
CDC	Centre of Disease Control
CFU	Colony Forming Unit
CRBSl	Catheter Related Blood Stream Infection
CVC	Central Venous Catheter
EJV	External Jugular Vein
ESRD	End Stage Renal Disease
HD	Hemodialysis
ICU	Intensive Care Unit
IDSA	Infectious Disease Society of America
IJV	Internal Jugular Vein
INR	International Normalized Ratio
KDOQI	Kidney Dialysis Outcome Quality Initiative
MIRSA	Methicillin Resistant Staphylococcus aureus
PEG	Polyethylene Glycol
PTT	Prothrombin Time
SCV	Subclavian Vein
TCC	Tunneled Cuffed Catheter
UTC	Un-tunneled Catheter

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Abstract

Background: A hemodialysis catheter is a small biocompatible tube made of soft flexible material. It is inserted into a patient's target vein to provide vascular access for hemodialysis. As important as catheter placing and handling guide-lines to prevent infection reporting standards are equally important, as they are the tools to enable us to evaluate our work attitudes, how much are we sticking to the guide-lines, how are we managing our resources, and are we aware of the resources we have or not. **Aim of the Work:** to figure the outcome and infection rate related to tunneled-cuffed catheters in patients with ESRD needing dialysis who were submitted to tunneled cuffed catheter placement during the period from May 2017 to April 2018. **Patients and methods:** This retrospective descriptive study was conducted in 35 TTCs patients in the Vascular Surgery department ASU Hospital. Target population included patients of ESRD who were submitted for tunneled cuffed dialysis catheter placement in the Vascular Surgery department ASU Hospital in the period from May 2017 to April 2018. **Results:** A total of 35 TCCs were inserted in end-stage renal disease patients for hemodialysis. Total number of catheter days was 6343 days. The primary unassisted patency rates at 6 months and 1 year were 51.4 % and 11.4 % respectively. Of the 35 cases 19 (54.28 % of the total population) reported infection episode. 5 (26.3 % of the infected population) TCCs were removed due to a severe episode of BSI, of the removed TCCs 2 (10.5 % of the infected population) were died. The TCC bacteraemia rate was 2.186 per 1000 catheter days. The total number of the removed TCCs was 14 (40 % of the total population). The reasons for removal were non-patency, infection, and completion of therapy with percentage of 22, 8%, 14.3%, and 2, 9% respectively. **Conclusion:** Tunnelled cuffed haemodialysis catheters are vital line of treatment in patients requiring long term haemodialysis especially elderly population with weak vasculature or consumed peripheral accesses in which it is considered an access of choice.

Key words: longevity, infection-free survival, permicath, turneled-cuffed catheters, ESRD patients, hemodialysis

Introduction

Centrally place venous catheters for hemodialysis have become an essential part of recently established medical care given to ESRD patients. The most important criteria that define centrally placed catheters is that there tips are positioned at the cavo-atrial area. Tunneled cuffed catheter is one of the devices used to be placed in a central vein for the purposes needing long term vascular access more than 3 weeks as determined by the national kidney foundation KDOQI [1].

Tunneled cuffed dialysis catheter has an important superiority over regular central venous catheters, which is having a subcutaneous cuff which is when placed subcutaneously it starts ingrowth forming a barrier that stops or delays infection.

Recently there is increased relying on centrally placed catheters to start and maintain hemodialysis (HD), one of the important reason behind this is the changing demographic population of patients needing HD with more elderly and diabetic patients with week target vasculature where surgical vascular access can be made [2].

Dialysis access related blood stream infection and the complications related to such problem requiring hospitalization, account for almost 1/3 of the cost of end stage renal disease (ESRD) management with documented death rate of 12-25.9% [3].

Surveillance data suggests that central venous catheters (CVCs) are associated with higher blood stream infection (BSI) rates than arteriovenous grafts (AVG) and arteriovenous fistula (AVF). With mean incidence of CRBSI for UTCs to be 5 episodes/1000 catheter days, and a lower mean incidence for TCCs to be 3.5 episodes/1000 catheter days [3].

The estimated cost of the treatment of an episode of BSI has been calculated to be in the range of US $3,800 to US $29,000 per patient. Although the reported risk of catheter related blood stream infection (CRBSI) is higher for un-tunneled catheters (UTCs) compared to tunneled cuffed catheters (TCCs), the management cost of TCC-related BSI is much higher [3].

International reports stated that a 250,000 cases of central venous catheter associated BSI occurs annually that when analyzed found to cost too much in the terms of morbidity and financially, so preventive guide-lines had been established to prevent such infection through a multi-disciplinary effort involving health care professionals who insert or remove CVCs, catheter maintenance provider, infection control personnel and those who allocate resources [4].

National kidney foundation DOQI stated that good practice while placing and nursing of the CVCs can reduce the incidence of infection dramatically near 4 fold which

certainly has a good impact on the final outcome regarding patient quality of life and the economic cost [1]. .

As important as catheter placing and handling guide-lines to prevent infection reporting standards are equally important, as they are the tools to enable us to evaluate our work attitudes, how much are we sticking to the guide-lines, how are we managing our resources and are we aware of the resources we have or not.

In Ain Shams University we are facing a good rate of ESRD patients who were submitted for tunneled cuffed dialysis catheter placement procedure. A big percentage of them presented in the outpatient clinic with an infection episode and some of them had removed the tunneled catheter, why infected? And what are the rates of infection regarding tunneled catheters?

Therefore, this study evaluates the infection rate related to tunneled cuffed dialysis catheter in patients suffering ESRD at Ain Shams University Hospital.

Aim of the Work

The study we have in our hands aims to figure the outcome and infection rate related to tunneled-cuffed catheters in patients with ESRD needing dialysis who were submitted to tunneled cuffed catheter placement during the period from May 2017 to April 2018.