

# **ABSTRACT**

## **TOPIC:**

“Isolation and phenotypic characterisation of bacterial isolates from catheter related blood stream infections in patients on Hemodialysis in a tertiary care hospital”

## **INTRODUCTION**

Hemodialysis is a procedure done in end stage renal disease patients to improve the quality of life. The procedure helps to remove waste from blood and thus helps in maintaining the body's fluid and chemical balance in renal failure patients. Central Venous Catheters are the main vascular access used for Hemodialysis procedure. Hemodialysis patients are prone for a plethora of infections, with clinical data suggesting that Central Venous Catheters being the main source for bacterial colonization and infection. Among the wide spectrum of infections associated with central venous catheters, Catheter Related Blood Stream Infection (CRBSI) is clinically the most important because of its potential to progress to sepsis. The incidence of Catheter Related Blood Stream Infection ranges between 5% to 14% of catheters, resulting in significant morbidity and premature removal of catheters. The majority of Catheter Related Bacteremia associated isolates are Gram-positive organisms like *Staphylococcus aureus* and other coagulase negative staphylococci. But few study reports show Gram-negative organism like *Pseudomonas* to be the culprit.

## **AIM:**

To Isolate and identify the Bacterial isolates associated with catheter related blood stream infections in Hemodialysis patients attending CMCH and to determine the virulence of the isolated organism

## **OBJECTIVE:**

1. To confirm the catheter related blood stream infections by Maki's semi quantitative method for catheter tip culture and peripheral blood culture.
2. Isolation and Identification of organism by routine conventional methods.
3. To study the antibiotic susceptibility profile of organism isolated by Disc diffusion- Kirby bauer technique.

4. To determine the virulence of the organism isolated by phenotypic method.

## **Materials and Methods**

It is a prospective study carried in a tertiary care hospital which included 153 renal failure patients on haemodialysis. catheter tip and simultaneously withdrawn blood from peripheral site for blood culture were obtained from the patients. Catheter tip was processed by Maki's roll plate method and blood culture was done. The organism isolated was identified by routine conventional methods and antibiotic susceptibility was done and the resistance pattern was analysed. biofilm formation by the organisms isolated was detected by tissue culture method.

## **RESULTS:**

In 153 patients with total catheter days 2501, total CRBSI cases were 13.72% (21/153) and the rate of CRBSI was found to be 8.39/1000 catheter days. Duration of catheterisation more than 15 days was found to be significantly associated with CRBSI. The most common predisposing factor was found to be Diabetes mellitus (71.4%) followed by low haemoglobin level (66.6%) and hypertension (61.9%). Most common organisms causing CRBSI in our study was *Pseudomonas aeruginosa* (47.61%), followed by *Klebsiella pneumoniae*. The antibiotic sensitivity pattern shows 47% of the strains as multi drug resistant,

Biofilm formation by the organisms implicated in CRBSI was detected by tissue culture plate method which showed *Pseudomonas aeruginosa* and coagulase negative staphylococci as strong biofilm producers, *Klebsiella pneumoniae* as moderate biofilm producer

## **CONCLUSION:**

Catheter related blood stream infection is one of the most frequent, costly and lethal complications of central venous catheterisation in haemodialysis patients. These infections may be the most common as well as the most preventable among all nosocomial infections. The rate of CRBSI is comparatively high, as found in our study and it also highlights the predominance of multi drug resistant gram negative bacteria which were also found to be biofilm producers. The spread of such organisms in hospital environment will lead to a clinical disaster as well a threat to

patient and public safety. Hence continuous surveillance of CRBSI and antimicrobial monitoring along with stringent infection control practices is needed to reduce the incidence of CRBSI.

**Key words:** Central venous catheter related blood stream infections, central venous catheter, Maki's roll plate method, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, Multi drug resistant.