

Catheter Related Infection In Geriatric Population On Hemodialysis, A Study From Central India

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Abstract: The patients of geriatric age group are more venerable to the renal failure due to various etiology. As age advances the immunity of patients also decreases and these patients are more prone for the infection related to the hemodialysis catheter. 37 patients of geriatric age group having age > 60 years on hemodialysis were included for the purpose of study admitted in Nephrology Unit, Pt.J.N.M. Medical College Raipur from was studied. In this study male affected more as compare to female. Catheter related infection was more common with patients having moderate to severe anemia. Infection more common in patients with hypoalbuminemia. Leukocytosis was seen in most of patients having catheter related infection. More was the duration of catheter more was the infection related complication. Catheter related infection more common in Hypothyroidism with Femoral catheter.

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Introduction-

Chronic kidney disease (CKD) is becoming a major public health problem worldwide. Currently it is estimated that people over 65 years old number approximately 420 million or about 7% of the global population. (Murugesan et al).

Infection is an important cause of morbidity and mortality among patients with ESRD. According to the United States Renal Data System (USRDS) registry. (Bethesda). infection is the second leading cause of death in patients with ESRD (the first is cardiovascular disease), and septicemia accounts for more than 75% of these infectious deaths. Indeed, among ESRD patients undergoing dialysis, the total death rate is 176/1000 patient-years, and septicemia and pulmonary infections combined account for close to 26/1000 patient-years. Annual death rates due to pneumonia and sepsis are markedly higher in dialysis patients compared with the general population; in the 65- to 74-year-old category. (Ivan D Maya et al)

Material & Method

This study was conducted at Nephrology Unit, Dept of Medicine, Dr.B.R.A.M. Hospital & Pt.J.N.M. Medical College, Raipur (C.G.). Study was conducted among 210 patients and out of which 37 patients were more than 60 yrs of age groups on hemodialysis.

The aim of our study was to find out the catheter related bacterial infection in chronic kidney disease in geriatric population.

Complete laboratory investigation included was done were complete blood count, blood urea, serum creatine, serum lipid profile, thyroid profile, serum albumin level was measured. Clinical parameter was

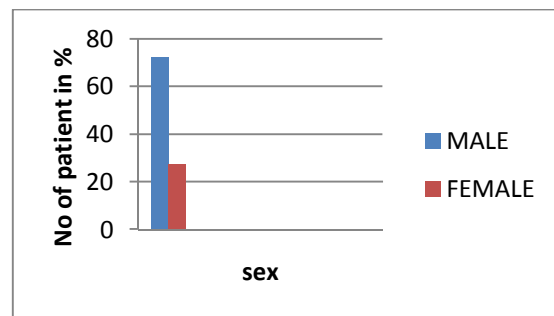
measurement of fever, redness and induration over site of catheter insertion was noted.

Results-

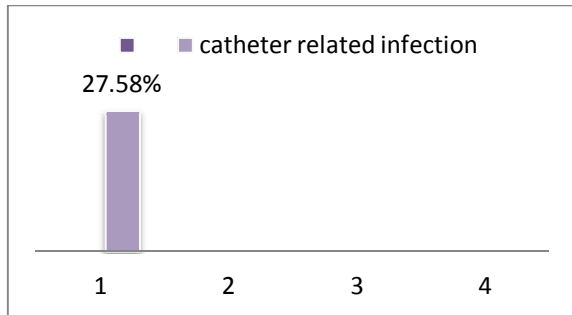
In this study group 72.41% was male and 27.58% was female and 27.58% patients suffering from catheter related infection in the form of fever with chills and rigors, redness and induration over the site of catheter insertion.

Among these patients 12.5% patients has mild anemia, 62.5% has moderate anemia and 25% has severe anemia. 87.5% was suffering from hypercholesterolemia having catheter related infection. Among patients suffering from catheter related infection 75% have hypothyroidism out of them 50% have femoral catheter, 33.33% has internal jugular and 18.5% has subclavian catheter.

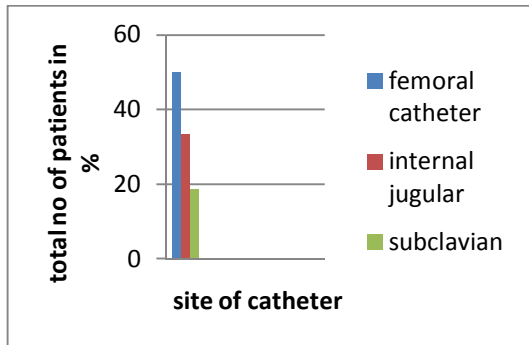
Hypoalbuminemia was seen 87.5% of patients. The mean total leucocyte count was $17120/\text{mm}^3 \pm 3385/\text{mm}^3$. duration of catheter was more than 7 days in 87.5% and less than 7 days in 12.5% of patients. 87.5% has serum creatine greater than 6mg /dl.



Graph 1-showing total no of patient in study.



Graph 2- showing catheter related infection in study.



Graph 3-showing site of catheter related infection.

Discussion

Infection is an important cause of morbidity and mortality among patients with ESRD. Epidemiological studies suggest that ESRD patients have a higher risk of contracting bacterial infections and that the 3 most commonly seen infectious complications are urinary tract infections (UTI), pneumonia, and sepsis. In addition to an increased incidence of being hospitalized with infections, patients with CKD have longer lengths of hospital stay during infection-related admissions compared with patients without CKD. (DR.BERTRAND L et al)

Among USRDS (United States Renal Data System) data admission rates for all causes, CVD and infection, are 38–46% higher for those with CKD than for those without. Rates for pneumonia in CKD were nearly three times higher than those for non-CKD. Hospitalizations for bacteremia/septicemia, were nearly four times higher for people with CKD compared to those without. Hospitalization rates for urinary tract infections were three-fold higher for people with CKD. (Sarnak et al)

It has been reported that the relative risk (RR) for death associated with the use of Central Venous Catheters compared with AVF is 1.4–3.4-fold greater.

More recently, the USRDS reported that in 2007 among incident hemodialysis patients mortality peaked in the second and third month after initiation of dialysis and that in the first month of initiation, hospital admissions for infection were twice as high as in

months 10–12. The rates of mortality from infection were greater in the second month of dialysis. Furthermore, admissions for infections were higher in the elderly hemodialysis. (Allon et al)

The risk factor was patients with ≥ 60 years of age, Female, Hypertension, Diabetes, CHF, Dehydration, Concurrent use of RAAS blocking agents, diuretics, lithium, NSAIDs, Large and/or repeat dosing of oral phosphate preparations, Hyperparathyroidism, immune-compromised patients. (Chertow GM et al).

The clinical feature of exit-site infections (ESIs) are characterized by erythema, tenderness, induration, or purulence at the CVC exit site, while tunnel infections (TIs) are characterized by signs of infection extending greater than 2 cm from the exit site. ESIs and TIs may occur concurrently with catheter related bacterial infection, especially with *Staphylococcus aureus* infections.

According to the Infectious Disease Society of America (IDSA) guidelines, diagnosis of Catheter related bacterial infection requires either growth of the same organism from a percutaneous blood culture and from a catheter tip culture, or that two blood samples (one sample from a catheter and the other from a peripheral vein) meet quantitative or differential time to positivity (DTP) criteria.

Quantitative blood cultures are defined by blood drawn through the catheter demonstrating a bacterial colony count 3 times greater than blood drawn peripherally, while DTP requires that bacterial growth from catheter drawn blood occurs 2 hours before blood drawn from a peripheral vein. (Sarnak MJ et al).

Although gram-negative and fungal do occur, gram-positive cocci make up the vast majority of HD-related infections. Most cases are attributable to *S aureus* and coagulase-negative *Staphylococcus* (CoNS), but enterococcal infections also occur.

CoNS is responsible for most CVC infections, *S. aureus* is more common with AVF and AVG infections. *S aureus* is more often associated with treatment failure and infectious complications of catheter related bacterial infection. Hematogenous complications of Catheter related bacterial infection include endocarditis, osteomyelitis, epidural abscess, and septic arthritis. (Powe NR et al).

Conclusion

In this study shows that male was more affected as compared to female and infection depends on the duration of catheter insertion. Catheter related infection was more common with patients having moderate to severe anemia and patients having hypothyroidism. Leucocytosis was seen in all patients having catheter related infection. Hypoalbuminemia was also seen in all patients. Duration of catheter in

most patients was more than 7 days have more catheter related infection and serum creatinine is more than 6 mg/dl in most of the patients.

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