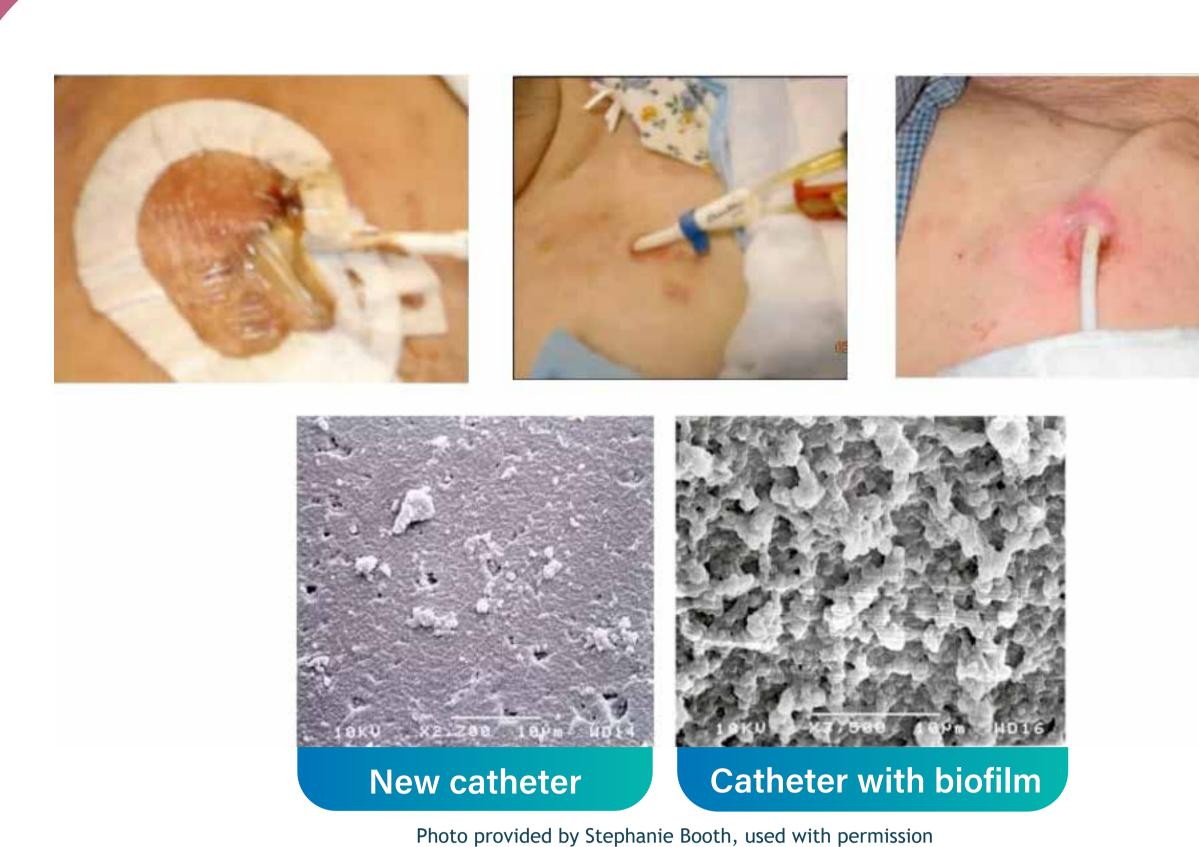
Effect of tunneled hemodialysis catheter antimicrobial lock solution (Taurolidine based) in prevention of catheter related blood stream infection and its impact on reduction of treatment cost.

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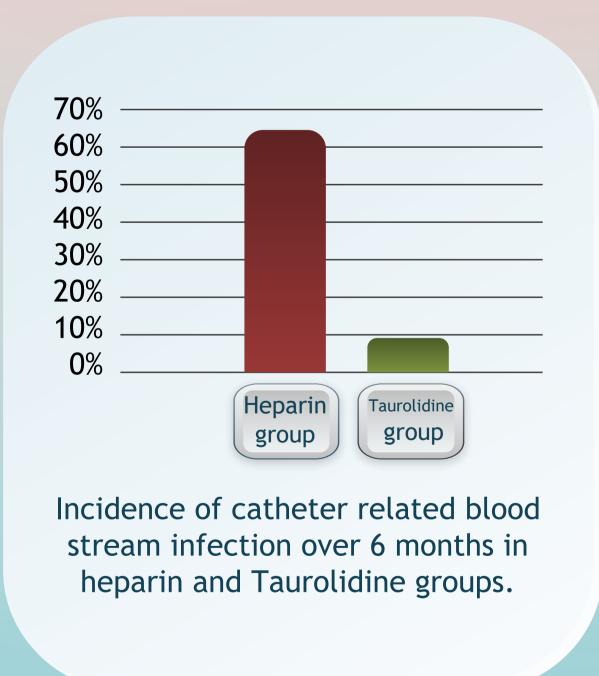
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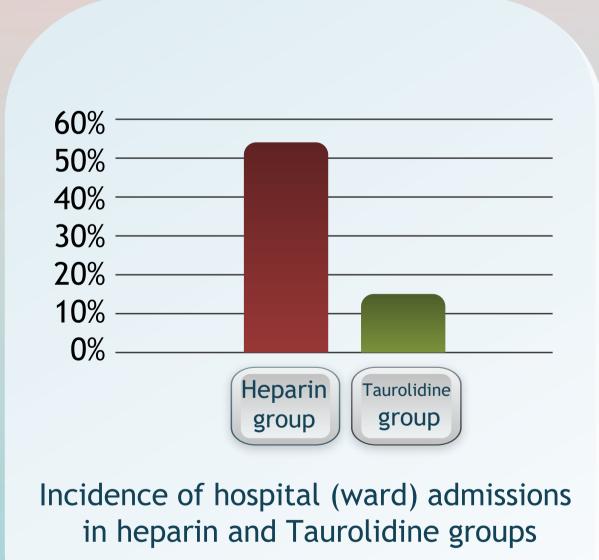
Background: Central venous catheters remain a common form of vascular access for patients with chronic hemodialysis, widespread application of central venous catheters exposes patients to an enhanced risk for catheter-related infection, which includes catheter-related bloodstream infection and exit-site infection. Many guidelines state that the use of pure heparin is no longer the gold standard but the guidelines do not provide a clear recommendation regarding the variation and availability of catheter lock solution. Taurolidine, a derivative of the amino acid taurine, is an antimicrobial lock solution and has broad-spectrum antibacterial activity against gram positive and gram-negative bacteria and fungi (such as Candida) (including MRSA and VRE) by the binding of its hydroxymethyl group to cell walls, proteins, and cytotoxins. Therefore, taurolidine can prevent the formation of biofilm in the catheter and reduce catheter related blood stream infection.

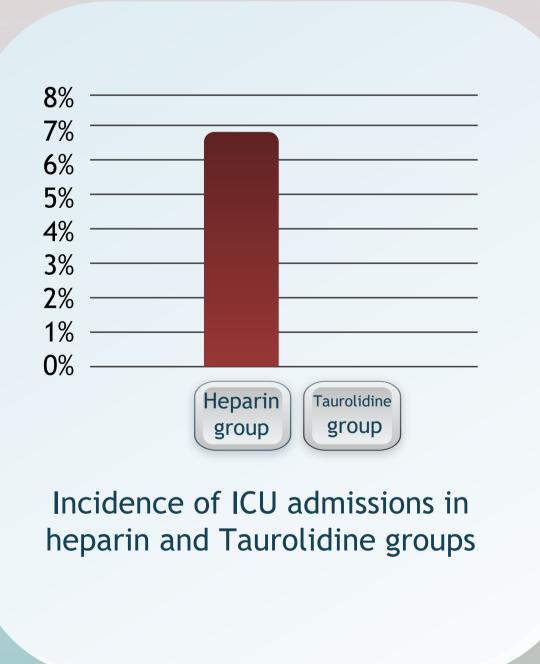
Methods: This prospective randomized controlled experimental study was performed on one hundred clinically stable adult end stage renal disease patients on regular hemodialysis through tunneled hemodialysis catheter in Sohar hospital hemodialysis unit, Oman. Total duration of the study is one year, divided into the first six months measuring incidence of catheter related blood stream infection occured to the patients using heparin as intraluminal catheter lock solution; Group (A), then the other six months measuring incidence of infection while these patients on (Taurolidine citrate 4% and heparin 500) lock Group (B). Comparison between both groups had been held regarding: incidence of infection, incidence of hospital and ICU admissions, incidence of catheter related complications, incidence of mortality and treatment cost. Written informed consents have been obtained from all patients participating in the trial.

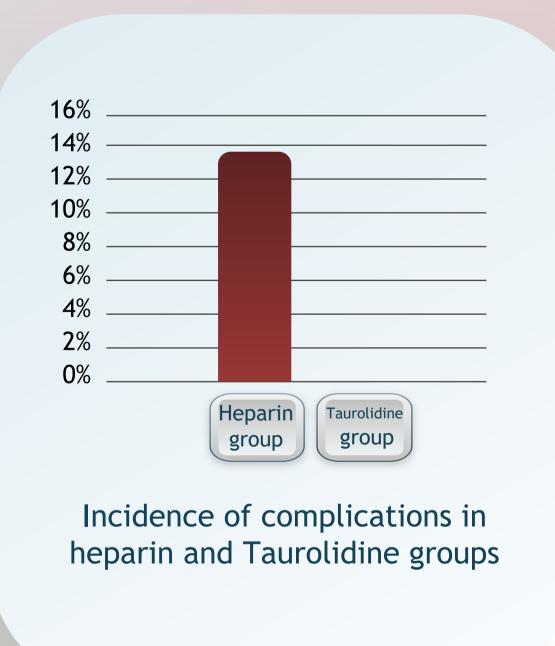


**Results:** The incidence of catheter related blood stream bacterial infections in 6 months in group (A) was 68% while that of Group (B) was 12% with high relative risk between the two groups (RR) 5.67 and highly significant statistical difference P(<0.001). In comparison between the two group regarding incidence of hospital admissions; Group (A) was 37 admissions with total days of ward admission was 552 days, compared to Group (B) was (2) admissions and total days of ward admissions was 15 days and this showed significant statistical difference of hospital admission P(<0.026). As a consequence, there was a significant reduction of total treatment cost; estimated total cost of ward admissions was (6896 RO) and ICU admissions was(4752 RO) in group (A) while it was (456 RO) and (0 RO) in group (B) respectively. The comparison between Group (A) and group (B) for incidence of total catheter related infection complications and mortality although revealed high clinical importance (Total catheter related complications incidence 11:0, mortality incidence 4:0 between the two groups) but didn't show statistical difference due to low numbers of patients.









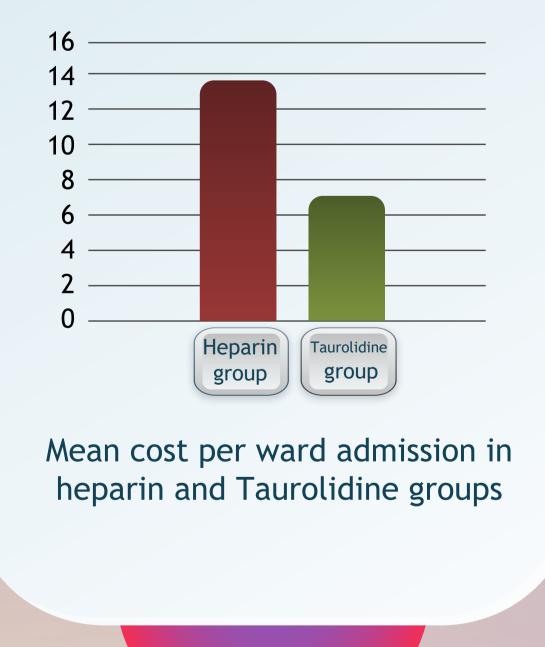


Figure (1)

Figure (2)

Figure (3)

Figure (4)

Figure (5)

## Conclusion:

Using of Taurolidine based lock as intraluminal tunneled hemodialysis catheter lock solution has showed highly statistical significant reduction of catheter related blood stream bacterial infection, and hospital admissions with consequent reduction of total treatment cost(cost-effective). Also it showed clinically reduction of incidence of catheter related blood stream infection complications and mortality. Studies are required to ascertain these effects on a larger cohort of patients.

**Keywords:** Hemodialysis, catheter related infection, Taurolidine.

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