

LONG TERM FOLLOW UP OF CATHETER - RELATED BLOODSTREAM INFECTIONS IN TUNNELED CUFFED HEMODIALYSIS CATHETERS

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INTRODUCTION

Tunneled cuffed haemodialysis catheters (TCC) are used for long term vascular access in a small proportions of patients mostly because opportunities for an arteriovenous access are exhausted. Catheter-related bloodstream infection (CRBI) is a frequent complication among hemodialysis (HD) patients (pts) using TCC.

SUBJECTS AND METHODS 1

Double - lumen cuffed tunneled dialysis catheters were placed and followed up ,by experienced nephrologists from the Vascular Access Unit at the Department of Nephrology, Clinical centre in Skopje, R. Macedonia, for the 3 year study period.

The study monitored 123 pts on regular haemodialysis program (71 females, 52 males, aged 16-78 years), who had 181 TDC, divided in three groups:

1. Tunneled femoral catheters (**TFC**) -103 - 77 pts
2. Tunneled jugular catheters (**TJC**) - 41- 24 pts
3. Tunneled subclavian catheters (**TSC**) – 37 - 22pts

SUBJECTS AND METHODS 2

Catheters **were removed** if they were **no longer needed** (AVF maturation, CAPD catheter ready, death of patient, renal transplantation or recovery of native function) or if a **significant complication** was encountered (catheter nonfunction or suspected Catheter-related bloodstream infection). Catheters were followed until one of these endpoints. Every patient with TCC with symptoms suggesting infection was considered to have possible CRBI.

SUBJECTS AND METHODS 3

All pts with TCC were **monitored for infection** and data recorded for each patient included: clinical signs of infection (high temperature, chills, connected with HD), episodes of CRBI, blood culture from catheter (**BCC**) and peripheral vein (**BCP**) when we had a suspicion of infection, antibiotic therapy and clinical outcomes. The purpose of this study was to evaluate the association between positive blood culture reporting by the clinical microbiology laboratory and antimicrobial management of pts with CRBI.

RESULTS AND DISCUSSION 1

Table 1. Follow up of TCC at the end of the study

Catheter status	TFC	TJC	TSC
Functioning catheters	8	12	8
Pts death with functio.cath.	9	1	1
Lost to follow up	13	2	1
Death conect with catheter	2	1	/
Elective catheter removal			
Mature AVF	12	2	3
Mature VG	2	/	1
Transplantation	2	1	/
Patient recovered	1	/	/
Removed for malfunction			
Poor flow	30 (29%)	14 (34%)	15 (40%)
High venous pressure	/	2	/
Clot or fibrin sheath	13	/	5
Broken catheter	1	2	2
Blooding around cathet	2	/	/
Thrombophlebitis (leg)	2	/	/
Suspected CAB	6 (5,8%)	4 (9,7%)	1 (2,7%)
TOTAL	103	41	37

RESULTS AND DISCUSSION 2

Table 1. Follow up of TCC with complications

Catheter status	TFC	TJC	TSC
Total No. of catheter days	9899	10719	9454
Average catheter days	5-512(139,4)	4-1704(428,7)	4-1607(350)
Elective catheter removal	17 (16,5%)	3 (7,3%)	4 (10,8%)
Removed for malfunction	48 (46,6%)	18 (44%)	22 (59,5%)
Susp. CRBI	6 (5,8%)	4 (9,7%)	1 (2,7%)
Infection rate*	4,1	2,8	3,6
Colonized catheters	30	4	7
No. of cath.with infection/AB treat	21/41	7/30	14/32
Phlebographies/Urokinaza	22/11	7/6	6/2

Infection rate* - number of infective episodes/1000 catheter days

RESULTS AND DISCUSSION 3

Table 3 Follow up of TFC with infections

Number of TFC with CRBI	21
Episodes of CRBI successfully treat. with AB	41
Episodes of CRBI unsuccessfully treat. with AB	6
<i>S. aureus</i>	4
<i>Enterococcus+Pseudomonas</i>	1
<i>CoNS</i>	1
INFECTIVE RATE	4,8 infective episodes/ 1000 cath. days

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Table 4 Follow up of TJC with infections

Number of TJC with CRBI	7
Episodes of CRBI successfully treat. with AB	30
Episodes of CRBI unsuccessfully treat. with AB	4
<i>S. aureus</i>	3
<i>Acinetobacter+Enterococcus</i>	1
INFECTIVE RATE	2,8 infective episodes/1000 cath. days

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Table 5 Follow up of TSC with infections

Number of TSC with CRBI	14
Episodes of CRBI successfully treat. with AB	32
Episodes of CRBI unsuccessfully treat. with AB	1
<i>S. aureus</i>	1
INFECTIVE RATE	2,8 infective episodes/1000 cath. days

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Table 6 Used AB therapy

	TFC	TJC	TSC
No	70 (68%)	0.32 (78%)	20 (54,1%)
Yes	33 (32%)	9 (22%)	17 (45,9%)
Total	103	41	37

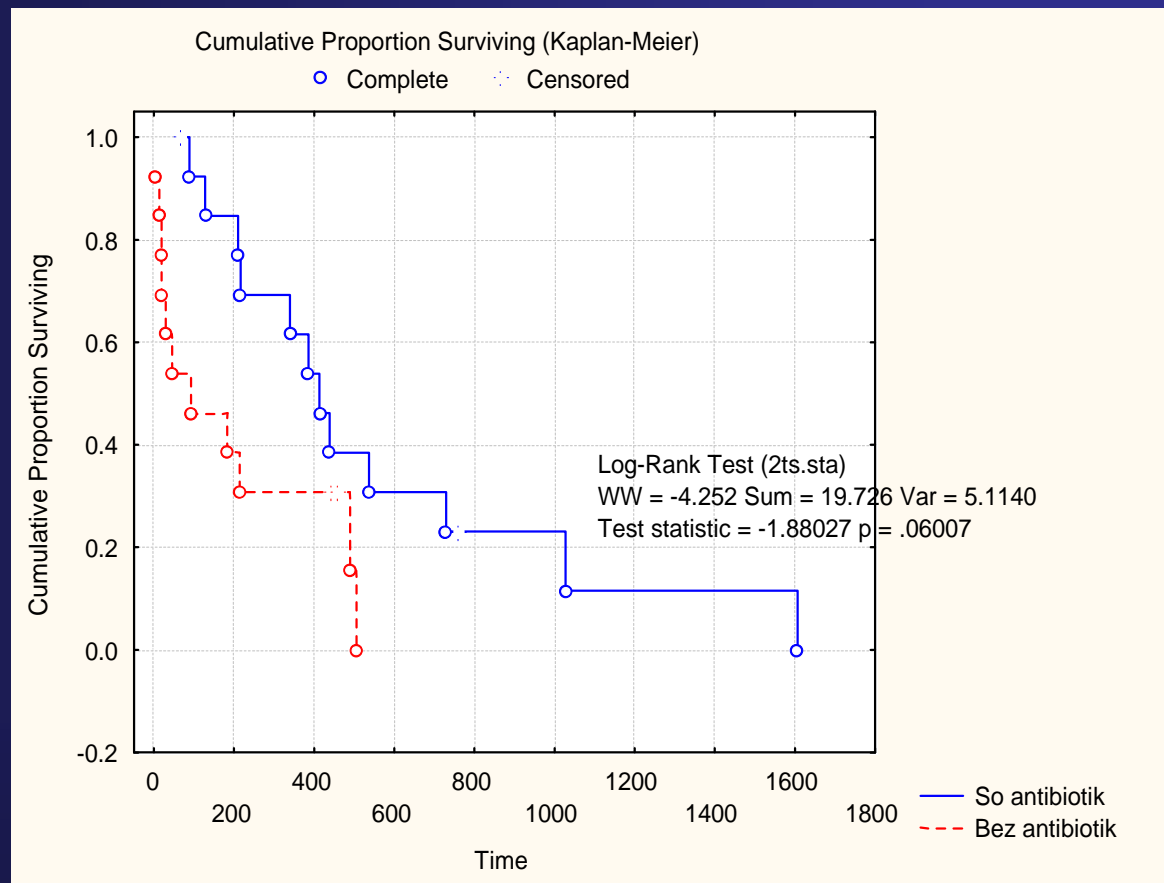
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Table 7. Types of AB

Antibiotics	TFC	TJC	TSC
Amoxicillin+Clavulonic acid	1 (2%)		
Cefotaxim	23 (46%)	5 (23,81%)	10 (33,33%)
Cefuroxim		1 (4,76%)	1 (3,33%)
Ceftriaxon	2 (4%)	2 (9,52%)	2 (6,67%)
Ciprofloxacin	5 (10 %)	4 (19,05%)	12 (40%)
Ceftazidim	2 (4%)		1 (3,33%)
Vancomycin	12 (12%)	7 (33,33%)	3 (10%)

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Table 8 Kaplan -Meier curve of survival of TCC treated with antibiotic therapy



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Antibiotic therapy was statistically significant for catheters survival especially in group 3 -TSC (log rank test=0,06) and using multivariant analysis, only in this group we found that positive blood culture (p=0,0008295) has prognostic value as a risk factor for free survival time for TCC.

CONCLUSION

We concluded that use of AB therapy was sensitive to causative bacteria and was effective and successful treatment modality in eradicating CRBI and this will reduce catheter replacement in some cases.

Tunneled femoral catheters have shorter duration time correlated with jugular and subclavian catheters but they can be an option for hemodialysis, because the percentage of complications in this group was not high.

Tunneled femoral catheters, usually are blamed for most infections, but this was not confirmed with our study.