Identification factors influencing central venous catheter outcomes

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Introduction

Haemodialysis patients with central venous catheters (CVC) have a high access infection risk. CVC infection and failure risks must be determined by analysing the individual influencing factors.

Objectives

To identify factors that may influence CVC failures and/or infections

Methods

We performed a retrospective analysis of database entries from 2014-2016 about influencing factors on CVC failure and CVC infection.

We classified gender, age, renal replacement therapy (RRT) history, exit-site care frequency and dressing type into different categories and reference groups (RefG) and estimated hazard ratios (HR) for CVC infection and failure in the different categories and RefG (Statistics: Wald test).

Results

Data were collected for 7,029 patients with tunneled CVC (average age: 64.93±15.06 years, 50.16% females). A lower relative risk for CVC outcome infection and failure was found in:

- females as compared to males [HR=0.752-0.831; CI 95%, p=0.049-<0.001]
- patients older than 75 years as compared to 50-65 years old [HR=0.807 for CVC failure outcomes; CI 95%, p=0.002]. (Other age groups did not show any significantly different risks.)
- weekly exit-site care as compared to exit-site care at every treatment [HR=0.725 for CVC failure outcomes; CI 95%, p=<0.001].

Conclusion

Factors such as female gender, age >75 years, weekly exit-site care, exhibited a significantly lower relative risks for both CVC failure and CVC infection as compared to the respective RefG. Worse outcomes in men could possibly be caused by gender differences in terms of hygienic behaviour or different willingness to learn. Therefore, nurses should focus on patient education.

Parameter	Category	Distribution
Gender	Female	50,2%
	Male	49,8%
Age	18-50 years	14,8%
	50-65 years	29,1%
	65-75 years	29,5%
	> 75 years	26,7%
Dressing Frequency	Twice per week	1,1%
	Weekly	21,3%
	Every Treatment	77,7%

Patient distribution

Parameter	Category	Reference	HR	95% CI		p value
Gender	Female	Male	0.752	0.552	1.024	0.049
Age	18-50 years	50-65 years	1.545	0.923	2.584	0.097
	65-75 years		1.703	1.107	2.622	0.015
	> 75 years		1.270	0.809	1.992	0.297
Dressing Frequency	Twice per week	Every Treatment	2.476	0.911	6.727	0.075
	Weekly		0.790	0.511	1.222	0.290

Cox model with primary outcome CVC infections

Parameter	Category	Reference	HR	95% CI		p value
Gender	Female	Male	0.831	0.754	0.918	<0.001
Age	18-50 years	50-65 years	1.005	0.862	1.172	0.941
	65-75 years		1.076	0.948	1.221	0.254
	> 75 years		0.807	0.703	0.926	0.002
Dressing Frequency	Twice per week	Every Treatment	1.500	1.008	2.231	0.046
	Weekly		0.725	0.625	0.842	<0.001

Cox model with primary outcome CVC failure

References

1. Rita L. McGill, Eduardo Lacson Jr., "Sex, race, and hemodialysis vascular access processes", J Vasc Access 2016; 00 (00): 000-000 - DOI: 10.5301/jva.5000657