EVALUATION OF ANTISEPTICS AND THE MICROBIOLOGICAL ENVIRONMENT REGARDING COMPLICATIONS OF PHLEBITIS CAUSED BY PERIPHERAL CANNULAS

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OBJECTIVES

Our aim was to demonstrate which of the different antiseptics is more effective in reducing phlebitis occurrence and to analyse the microbiological environment on the skin surface around the puncture point of the cannula.

METHODS

An experimental, qualitative, quantitative study was performed between July and October of 2021 by collecting samples weekly at the Departments of the University of Pécs Clinical Centre. Patients included in our study gave written consent, had a peripheral cannula for more than 24 hours, and did not receive oncology treatment. We took, cultured microbiological samples from the skin area around the puncture, and kept survey sheet about cannulas as well. Data were analysed with SPSS 25.0, descriptive statistics, correlation analysis, $\chi 2$ test, ANOVA, and independent samples t-test were calculated ($p<0.05$).

RESULTS

70% isopropyl alcohol (according to descriptive statistics) is most effective in preventing phlebitis. There were no differences between antiseptics with different agents, such as: 72.9% ethanol (n=29), 70% isopropyl alcohol (n=3), octenidine dihydrochloride / phenoxyethanol (n=9), 2% chlorhexidine digluconate (n=3), and the incidence of phlebitis (p=0.798). Microorganisms were cultured in 47.2% of skin inoculations (n=51). Cannulas placed into the elbow flexions (n=14) had significantly more microbes than those in the forearms (n=55) and hands (n=35) (p=0.036). Cannulas were in the vasculature for an average of 86.55±58.00 hours (min=7, max=316). There was no significant difference in the incidence of phlebitis between cannulas used for ≤96 hours (n=30) and cannulas used for ≥97 hours (n=14; p=0.247).

CONCLUSIONS

During peripheral short cannula usage, Cutasept disinfectant should be preferred if possible, however, other formulations tested could be used as well and areas of elbow flexion should be avoided to prevent phlebitis development. Based on our study, phlebitis as a complication can be traced back to mechanical or chemical causes in addition to microbial infection.

Variable	Number		Variable	Number	
Total number	n=108		Use of gloves		
Gender			Yes	68	63%
Man	47	44%	No	40	37%
Woman	61	57%	Impact time of antiseptics		
Antiseptics			0-9 sec	32	30%
2% chlorhexidine digluconate	10	9%	10-20 sec	76	70%
octenidine dihydrochloride / phenoxyethanol	19	18%	Use of catheter		
72.9% ethanol	67	62%	0-96 hours	80	74%
70% isopropyl alcohol	12	11%	≥ 97 hours	28	26%

Table 1.
Descriptive statistics presentation (N=108)

Incidence of phlebitis		Type of antiseptics			
		2% chlorhexidine digluconate	octenidine dihydrochloride / phenoxyethanol	72.9% ethanol	70% isopropyl alcohol
	Yes	30.0%	47.4 %	43.3 %	25.0 %
	No	70.0%	52.6%	56.7 %	75.0%

Table 2.
Comparison of the effectiveness of skin disinfectants (n=108)

Location of catheter insurance		Incidence of phlebitis	
		Yes	No
	Antecubital area	78.6 %	21.4 %
	Forearm	40.0%	60.0 %
	Hand head	48.6%	51.4%

Table 3.
Microorganism culture is in canula puncture sites (n=104)

Incidence of phlebitis		Application time of catheter	
		0-96 hours	≥ 97 hours
	Yes	37.5 %	50.0 %
	No	62.5%	50.0 %

Table 4.
Phlebitis and cannula use times (n=108)

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