Routine daily application of mupirocin at both the exit-site and intranasally in all PD patients: an effective approach to prevent *S. aureus* peritonitis with low risk of resistance

UMC Utrecht

VUmc VU University Medical Center Amsterdam

Alferso C. Abrahams[1], T.M. Nagtegaal[1], W. Rüger[2], D.J. Hetem[3], M.J.M. Bonten[3], F.J. van Ittersum[2], W.H. Boer[1]
[1]Dept. of Nephrology, UMC Utrecht, [2]Dept. of Nephrology, VU University Medical Center, Amsterdam, [3]Dept. of Clinical Microbiology, UMC Utrecht, The Netherlands

Background

- ***Staphylococcus aureus* (SA) peritonitis** causes morbidity, technique failure, and mortality
- Accounted for 15% of all PD peritonitis episodes
- Guidelines recommend prevention by intermittent intranasal application of mupirocin in SA nasal carriers only
- Despite using this approach, SA peritonitis remained common in the UMCU

New UMCU mupirocin protocol (since June 1999)

➢ **Routine daily application of mupirocin at both exit-site (topical prophylaxis) and intranasally (prevention of nose-hand-exit site contamination) in all PD patients, regardless of SA carrier status**

Aim

➢ **To investigate the effectiveness of the new UMCU mupirocin protocol**
➢ **To investigate the prevalence of mupirocin resistant SA induced by it**

Methods

- Comparing SA peritonitis rates **before (January 1998 until May 1999)** and **after (June 1999 until December 2008)** introduction of new UMCU protocol
- Using two large contemporaneous (1998-2008) peritonitis databases from UMCU and VUmc
- **VUmc mupirocin protocol:** monthly intranasal application in SA carriers only
- **Analysis within-center (before vs. after)** and **between-centers (UMCU vs. VUmc)**
- Analyze all culture results of UMCU PD patients between 2001 and 2015 using electronic database of Dept. of Clinical Microbiology of the UMCU

Results

Table 1. Baseline characteristics

	UMCU	VUmc	*P*-value
Total non-relapse peritonitis episodes	264	325	
Patients	148	265	
Male	82 (55.4%)	153 (57.7%)	0.68
Age at start PD (years)	53.2 (42.0-64.6)	55.7 (40.9-68.5)	0.27
APD	82 (55.4%)	130 (49.1%)	0.22
Total PD duration (years)	290.9	598.1	

Figure 1. SA peritonitis rates in UMCU and VUmc between 1998-2008

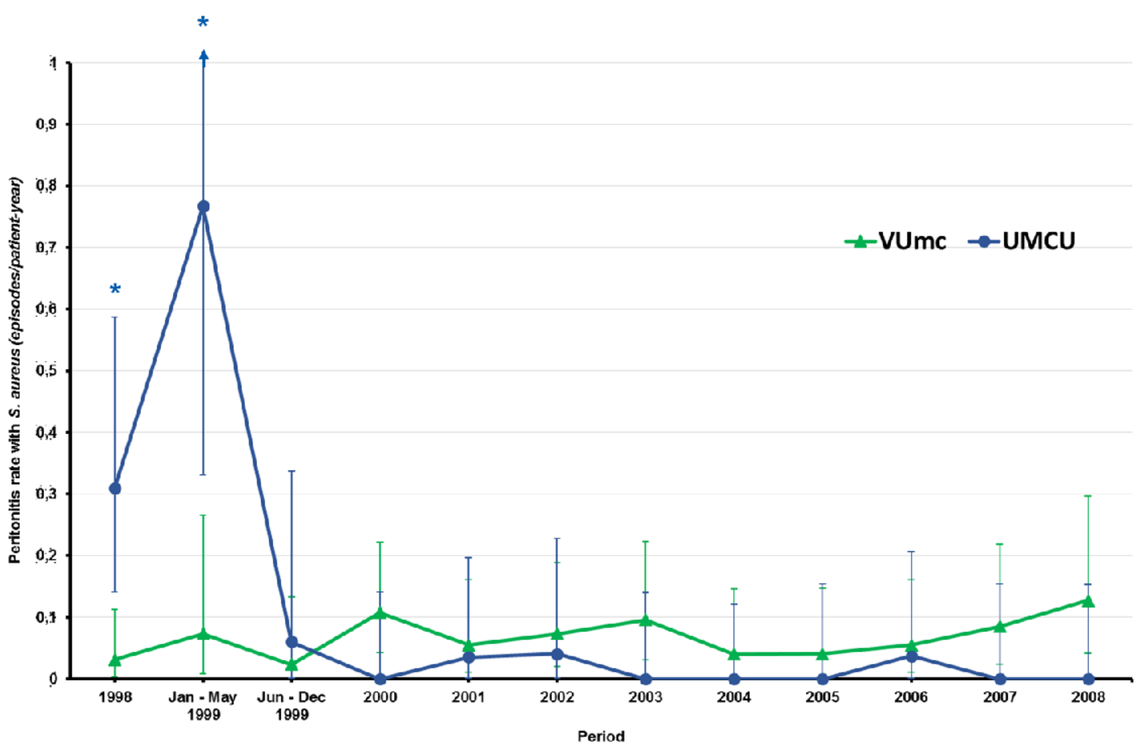

Table 2. Within-center analysis of peritonitis rates (episodes/patient year)

Microorganism	UMCU Jan 1998-May 1999	UMCU Jun 1999-Dec 2008	*P*-value	VUmc Jan 1998-May 1999	VUmc Jun 1999-Dec 2008	*P*-value
S. aureus	0.43	0.02	< 0.0001	0.04	0.07	0.36
Other gram-positives	0.63	0.45	0.12	0.34	0.25	0.12
Gram-negatives	0.35	0.23	0.13	0.18	0.20	0.70
Fungal	0.00	0.03	0.29	0.04	0.04	0.84
All peritonitis episodes	1.47	0.82	< 0.0001	0.59	0.53	0.48

Table 3. Between-centers analysis of peritonitis rates (episodes/patient year)

Microorganism	UMCU Jan 1998-May 1999	VUmc Jan 1998-May 1999	*P*-value	UMCU Jun 1999-Dec 2008	VUmc Jun 1999-Dec 2008	*P*-value
S. aureus	0.43	0.04	< 0.0001	0.02	0.07	0.02
Other gram-positives	0.63	0.34	0.02	0.45	0.25	< 0.0001
Gram-negatives	0.35	0.18	0.051	0.23	0.20	0.37
Fungal	0.00	0.04	0.19	0.03	0.04	0.43
All peritonitis episodes	1.47	0.59	< 0.0001	0.82	0.53	< 0.0001

Table 4. Prevalence of mupirocin resistant SA in UMCU 2001-2015

	Cultures	PD patients
Total	6860	217
Staphylococcus aureus	120 (1.8%)	32 (14.8%)
Mupirocin resistant SA	27 (0.4%)	6 (2.8%)[1]

[1]Only one patient had PD-related infections with mupirocin resistant SA

CONCLUSIONS

➢ **Routine combined daily exit-site and intranasal application of mupirocin in all PD patients without considering SA carrier status**
  ✓ **Is effective in preventing SA peritonitis and more successful than monthly intranasal treatment limited to SA carriers**
  ✓ **Is associated with a very low risk of mupirocin resistance**
➢ **Possible explanations for the restricted effect of the traditional intermittent mupirocin protocol include fluctuating SA nasal carrier status, inadequate SA status surveillance and the intrinsic discontinuous nature of the protocol, which may promote incompliance**

University Medical Center Utrecht
A.C.Abrahams@umcutrecht.nl

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