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Background

- Gram positive organisms are the most common cause of peritonitis in patients treated with peritoneal dialysis (PD)¹
- Data from small pharmacokinetic studies suggest antibiotic clearance varies with:
 - PD modality:** Continuous Cyclic PD (CCPD) associated with higher antibiotic clearance than Continuous Ambulatory PD (CAPD)^{2,3}
 - Residual renal function**^{4,5}
- Few studies have examined factors that affect outcomes of peritonitis treatment

Objective

- To determine the effect of PD modality, residual renal function, and other patient factors on gram positive peritonitis treatment outcomes

Methods

- Retrospective 8-year review (2003-2010) of all bacterial gram positive peritonitis episodes treated with cefazolin experienced by patients of the Home PD Unit at Toronto General Hospital
- Data was collected prospectively daily during peritonitis treatment, including daily intraperitoneal white cell count

Methods

- Primary outcome: time to resolution of the intraperitoneal (IP) white blood cell (WBC) count
- Secondary outcome: treatment failure defined as relapse or recurrence (defined by ISPD), PD catheter removal, change to hemodialysis, or death during peritonitis treatment
- Statistical Methods: Cox proportional hazards model

Results

Table 1. Patient characteristics

Patients (n)	119	Sex (% male)	47.8
Peritonitis episodes (n)	178	PD vintage (mean, yr)	3.6
Episodes treated in hospital (n, %)	9 (5.1)	CAPD (n, %)	86 (48)
Age (mean, range)	63.0 (19-92)	CCPD (n, %)	92 (52)
Weight (mean, kg, range)	67.8 (34.5-134)		

Figure 2. Creatinine Clearance by PD Modality

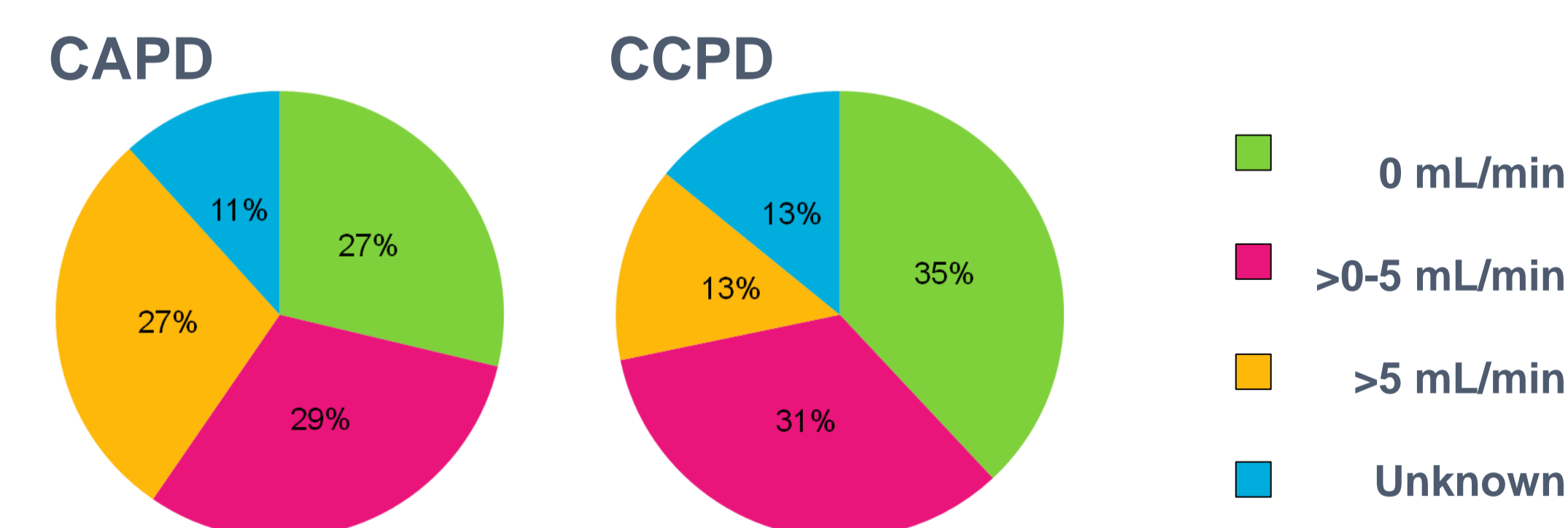


Table 2. Cultured organisms

Gram Positives	178
Coagulase-negative Staphylococcus	108 (60.7%)
Streptococcus sp.	40 (22.5%)
Enterococcus sp.	9 (5.1%)
Staphylococcus aureus	8 (4.5%)
Corynebacterium sp.	6 (3.4%)
Other	7 (3.9%)

Results

Table 3. Primary analysis results

Factor	HR	95% CI	P-value
CAPD vs. CCPD	0.88	0.59 – 1.31	0.53
CrCL 0 vs. >5	2.90	1.60 – 5.27	0.0005
CrCL >0-5 vs. >5	2.42	1.53 – 3.82	0.0002
PD vintage	0.99	0.988 – 0.998	0.0049
Hospitalization	1.26	0.84 – 1.87	0.26
Age	1.02	1.002 – 1.04	0.031
Change in abx	1.28	0.93 – 1.75	0.13

Table 4. Secondary analysis results

Factor	HR	95% CI	P-value
CAPD vs. CCPD	1.88	0.75 – 4.74	0.18
CrCL 0 vs. >5	0.095	0.022 – 0.41	0.002
CrCL >0-5 vs. >5	0.12	0.036 – 0.41	0.0007
PD vintage	1.02	1.004 – 1.03	0.01
Hospitalization	0.99	0.40 – 2.43	0.98
Age	0.94	0.92 – 0.97	<0.0001
Change in abx	0.77	0.32 – 1.82	0.55

CrCL = creatinine clearance

Discussion

- Higher renal creatinine clearance associated with decreased resolution of IP WBC and increased risk of treatment failure**
 - suggests renal antibiotic clearance may lead to lower antibiotic levels and worse outcomes in non-anuric patients

Discussion

- PD vintage** and **younger age** associated with **decreased resolution** of IP WBC count and with **increased risk of treatment failure**
 - magnitude of effect appears small, clinical significance unclear
- Other factors non-significant
 - although antibiotic clearance is higher in CCPD vs. CAPD, total daily clearance may not be different enough to be clinically significant
- Limitations: retrospective design, missing daily intraperitoneal white cell data for some patients, treatment failures censored at 90 days may have biased results

Conclusion

- Higher renal creatinine clearance, PD vintage and younger age** are associated with **decreased resolution** of the intraperitoneal white cell count during peritonitis treatment and **increased risk of peritonitis treatment failure.**

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