

Impact of COVID-19 on the peritonitis rate in peritoneal dialysis (PD) patients (Pts); a monocentric retrospective study

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1. Introduction

Peritonitis is a common but serious complication of PD. Besides a mortality rate of about 16 % of PD pts, recurrent peritonitis can lead to PD failure and conversion to hemodialysis. Guidelines recommend an overall peritonitis rate of no more than 0.5 episodes per pt-year with nursing care provided by a qualified and experienced team. This has been achieved for years in our hospital thanks to rigorous follow-up protocols put in place since 2010 and performed by a nursing staff fully dedicated to PD pts. (see overall trend of peritonitis in figure 2)

2. Method

During the COVID-19 pandemic, continuous physical follow-up of PD pts was suspended from February until end-June 2020 and replaced by regular telephone calls without any access to telemedicine. Later on, the usual follow-up procedure could not be restored until the end of August, because the whole PD nursing staff (3 nurses) suffered COVID-19 with long sick leaves. The present study aims to investigate the impact of the COVID-19 pandemic on peritonitis rates in our institution in 2020 compared to 2019. We also compared the microbiological findings of every peritonitis episode.

3. Results

Since 2010, we observed a dramatic and linear decline in peritonitis rates due to new follow-up protocols. An ultimate low was seen in 2019 where we observed 4 peritonitis episodes in 38 pts with an overall peritonitis rate of 0.16 per patient-year out of which 25 % were due to Gram positive cocci (CG+).

In 2020, the number rose up to 27 episodes (0.91 per pt-year) in 38 pts all being due to GPC.

The time to first peritonitis episode (days) was reduced in 2020 as compared to 2019 (233 +/-21 vs 317 +/- 25; p=0,022)

The COVID-19 pandemic resulted in a **fivefold increase** of CG+ peritonitis rate, 15 hospitalizations, 4 catheter changes, one shift to HD and one death.



Figure 1. Time course of DP peritonitis episodes in 2020 showing rise of Gram-positive Cocci.

Legend: CG+= Gram positive Cocci; BGN = Gram-negative bacilli; the COVID-19 curve represents a Schematic view of the overall COVID-19 hospitalization rate in Belgium (no unit, purely for visual's sake)

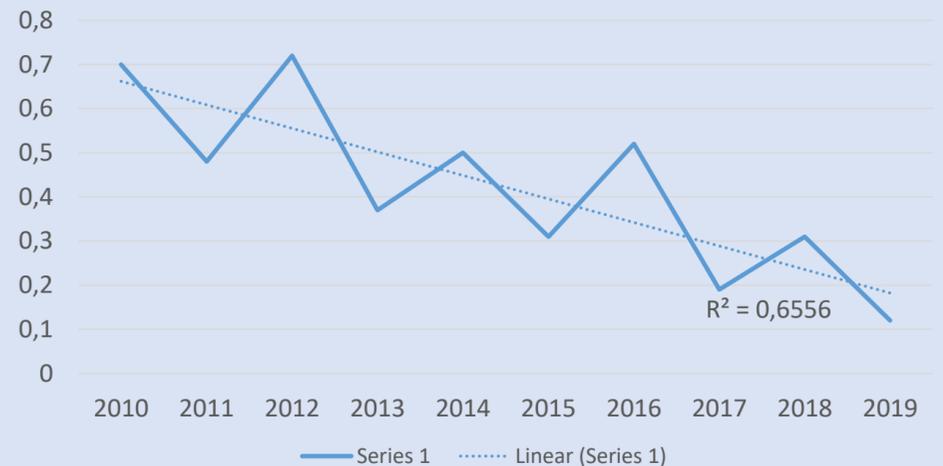


Figure 2. Peritonitis rates (per patient-year) with overall trend from 2010 to 2019

Table 1. Microbiology

	Year 2019	Year 2020
Peritonitis Numbers	n (%)	n (%)
Total	4 (100)	27 (100)
Relapsing peritonitis	0	3
Peritonitis-free patients	19	24
Chylous and germ-free	4	0
Peritonitis rates (per patient-year)	0.16	0.91
Gram + Cocci		
Total	1 (25)	15 (55.5)
E. faecalis	0	4
S. pneumoniae	0	1
S. aureus (met-S)	1	3
S. epidermidis	0	4
S. haemolyticus	0	2
S. agalactiae	0	1
Gram + Bacilli		
Total	1 (25)	1 (3.7)
Corynebacterium jeikeum	1	0
Unspecified	0	1
Gram - Bacilli		
Total	1 (25)	5 (18.5)
Acinetobacter non-specified	0	1
E. cloacae	0	2
E. Coli	1	1
Pseudomonas aeruginosa	0	1
Unidentified		
Total	1 (25)	6 (22.2)

4. Discussion

Borg D. et al in 2003 demonstrated a **fivefold reduction** of peritonitis through the training and retraining of patients, reducing the cost and rate of hospitalizations. During a pandemic, the will to avoid contact for patient's safety might bring worse outcomes due to the lack of re-education of exchange protocols in PD.

Since the COVID-19 pandemic, the rate of CG+ infections rose to 100% from probable exit-site catheter infection due to a lack of hygiene during the fluid exchanges.

5. Conclusion

This study shows how significant a program of patient's training and re-training is as well as having a coherent, well trained and motivated medical and nursing staff. We also demonstrate the risks of staff shortage on medical results.