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CENTER-TO-CENTER VARIATION OF STERILE PERITONITIS RATES IN THE RDPLF

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Résumé

La fréquence des péritonites dans le Registre de Dialyse Péritonéale de Langue Française est d'un épisode tous les 32 mois-patients. Le but de cette étude est d'évaluer le pourcentage de péritonites sans germe identifié dans l'ensemble des centres, et par centre.

Methodes : un premier groupe représentant tous les patients traités en France métropolitaine en 2017 a été sélectionné pour identifier le taux de péritonites et le pourcentage de péritonites aseptiques. Certains centres ont des taux très bas et les pourcentages de péritonites aseptiques auraient eu peu de valeur sur de petits nombres, aussi avons-nous sélectionné un second groupe de patients, traités entre 2010 et 2017 et retenu les centres qui avaient eu au moins 20 péritonites. Le taux de péritonites aseptiques dans ces centres a été calculé individuellement par centre. Une enquête complémentaire a également été réalisée auprès des centres pour connaitre leurs conditions de prélèvement des liquides de dialyse péritonéale.

Résultats : En 2017 sur 1071 péritonites, on ne retrouvait pas de germe dans 17,2 % des cas. Au cours de la période de janvier 2010 à décembre 2017, 6068 péritonites ont été déclarées dont 954 sans germe retrouvé, soit 15,7 %. Cent et un centres ont eu plus de 20 épisodes de péritonites. Dans ces centres, le pourcentage de péritonites aseptiques a varié de moins de 6 % à plus de 50%. L'enquête additionnelle a révélé que les conditions de prélèvement étaient très variables d'un centre à l'autre et parfois non connues de l'ensemble des membres d'une même équipe.

Conclusion : les taux de péritonites en France et le pourcentage de péritonites aseptiques sont conformes aux recommandations internationales. Cependant ils existe une variabilité importante inter centres qui nécessiterait de définir les meilleures conditions de prélèvements et l'application des bonnes pratiques bactériologiques. Cela souligne aussi l'intérêt, lors d'études, de prendre en compte l'effet centre dans les modèles statistiques.

Mots clés : dialyse péritonéale, péritonite stérile, culture bactériologique

Abstract

Aim : Peritonitis rate in the French Language Peritoneal Dialysis Registry (RDPLF) is one episode per 32 patient-months. The purpose of the present study is to evaluate the percentage of germ-free, or aseptic, peritonitis in all centers, and also by center.

Methods : a first group representing all patients treated in metropolitan France in 2017 was selected to identify the rate of peritonitis and the percentage of aseptic peritonitis. Some centers have very low rates and the percentages of aseptic peritonitis would have had little value on small numbers, so we selected a second group of patients treated between 2010 and 2017 and retained centers that had at least 20 peritonitis. The rate of aseptic peritonitis in these centers was calculated individually per center. An additional survey was also carried out at the centers to find out their conditions for collecting and culturing effluent peritoneal dialysis fluid.

Results : In 2017, out of 1071 peritonitis, 17.2% had no germ identified. During the period from January 2010 to December 2017, 6068 episodes of peritonitis were reported, including 954 without any germ identified (15.7%). One hundred and one centers had more than 20 episodes of peritonitis during this period. In these centers, the percentage of aseptic peritonitis has varied from less than 6% to more than 50%. The additional survey revealed that the sampling conditions varied considerably from one center to another and sometimes they even were not known to all members of the same team.

Conclusion : the peritonitis rates in France and the percentage of aseptic peritonitis are in line with international recommendations. However, there is considerable inter-center variability which would require defining the best sampling conditions and the application of good bacteriological practices. It also highlights the interest of taking into account the center effect in statistical models used in studies.

Keywords : peritoneal dialysis, aseptic peritonitis, bacteriological cultures

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INTRODUCTION

The RDPLF registry for the last few years shows that the peritonitis rate in France has stabilized at levels deemed low: around 1 episode every 32 months (or 0.37 episodes per year, using the mode of expression recommended by ISPD [1]). These results should not obscure the fact that in 2017, peritonitis was the cause of 9 deaths (1.6% of deaths) and 82 definitive transfers to hemodialysis (16% of transfers) listed in the RDPLF. Apart from rare cases of sterile chylous peritoneal dialysate (see Gaied Hanene's article in this issue) or eosinophilic reactions, the absence of organisms in a peritoneal fluid drainage during true infectious peritonitis may be the cause of inappropriate initial therapy, and thus the cause of technical failure or even death. The identification of the organisms in question is therefore necessary and requires a rigorous bacteriological technique, which is also the subject of a separate article in this issue. The purpose of the present study is to identify the numbers and causes of aseptic peritonitis in patients treated by peritoneal dialysis in France.

PATIENTS AND METHODS

Quality control

- The RDPLF includes a main module (Survival and Infections), which is mandatory for all participating centers, as well as optional modules (2). The main module is more than 95% complete for all patients treated with peritoneal dialysis in France. Data updating is done in real time for most centers, which limits errors and omissions.
- The software automatically detects if no peritonitis is declared when the cause of PD failure of a patient is recorded as being peritonitis. It also sends alarms to signal any peritonitis whose causative organism is not declared.
- When the peritonitis rate in a center is significantly lower than the average or when it varies significantly from the previous year, the secretariat calls the center to request confirmation or verification of the data.
- All turbid fluid episodes are reported, whether they are true peritonitis, chemical peritonitis or chyloperitoneum. Contrary to the recommendations of the ISPD, the centers are also asked to report all recurrences, even early. The program then makes it possible to provide the results by distinguishing these different cases.

Selection

1) In order to evaluate the rate of sterile cloudy fluid per center and to have a sufficient number of peritonitis cases per center, we have selected all patients treated since January 1, 2010 in centers that had had at least 20 turbid liquid episodes during this period. We have then calculated the percentage aseptic peritonitis per center.
2) Episodes of cloudy fluid related to chyloperitoneum or bleeding or eosinophilic reaction were excluded from the analysis.
3) This was a complementary study: a questionnaire was sent to all the centers to ask them to explain their sampling methods.

RESULTS

- In 2017, there were 1094 episodes of cloudy peritoneal drainage in metropolitan France. Twenty involved chyloperitoneum, 2 an unexplained reaction to eosinophils and in1 case the liquid was not collected.

In the remaining 1071 episodes, a micro-organism was found 887 times, which meant a negative culture peritonitis rate of 17.2% in 2017.

- During the period from January 2010 to December 2017, 6068 cases of peritonitis were reported, including 954 without micro-organism found, or 15.7% aseptic peritonitis. One hundred and one centers had more than 20 episodes of peritonitis (with or without micro-organisms found).The percentage of aseptic peritonitis per center during the period 2010–2017 is shown in Figure 1.

-Among these centers, 72% had an aseptic peritonitis rate of less than 20%, and the remaining 28% had percentages of aseptic peritonitis that ranged from 21% to 58%. Thirty-two percent had an aseptic peritonitis rate of less than 10%. Figure 1 shows the distribution of centers that had more than 20 cases of peritonitis between 2010 and 2017, based on their percentage of aseptic peritonitis.

DISCUSSION

In France, the percentage of peritoneal infections without micro-organism found is 16%, in line with the ISPD recommendations, which state that it must be less than 20% (1). Nevertheless, there is a significant disparity between centers. This underscores the necessity for each team to evaluate not only its infection rate, but also its percentage of negative cultures. The fact that 30% of the centers are able to identify a micro-organism in more than 90% of cases shows that this is possible, and that the rates of aseptic peritonitis recommended by the ISPD should be lower. The lack of identification of a micro-organism makes it difficult to treat peritonitis if the initially prescribed probabilistic antibiotic therapy fails. The lack of identification of the micro-organism may have several causes, in particular the sampling method

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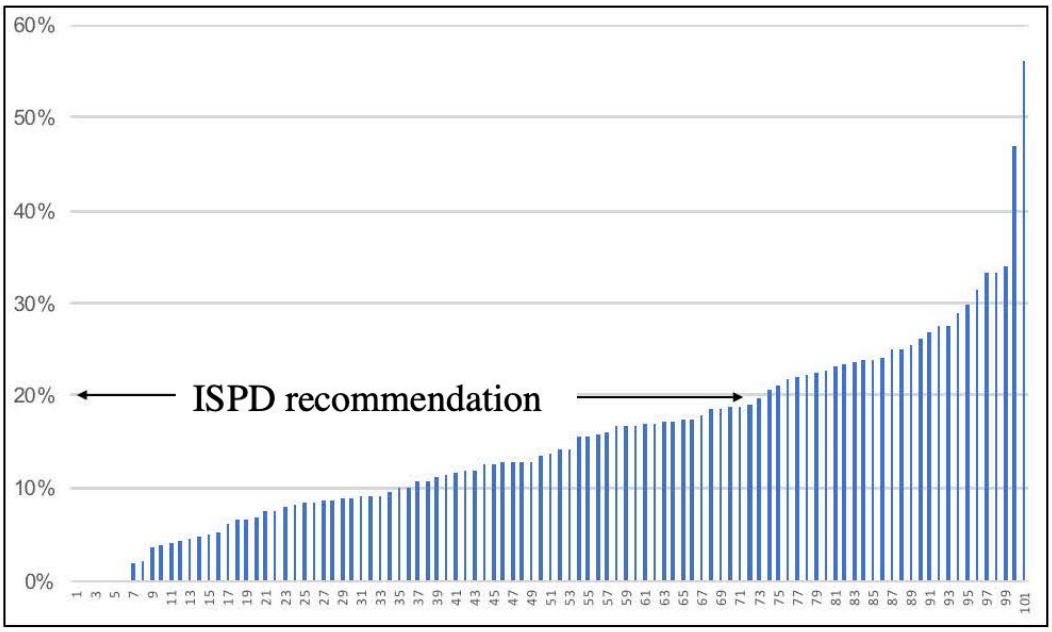

Fig. 1: Percentage of aseptic peritonitis micro-organismper center with more than 20 turbid episodes between January 1, 2010 and December 31

and the bacteriological technique itself. The survey of the centers in this study revealed a great disparity in sampling techniques, sometimes on important aspects such as reporting to the laboratory if the patient received antibiotics. More surprisingly, a large portion of staff, doctors and nurses sometimes did not know how to answer questions. This great

Results of the sampling survey;
the numbers of answers to each question are indicated:

Does the patient come full belly, the peritoneum is drained into the service in a pocket of CAPD and the liquid inoculated on culture broth

YES : 113
NO : 24
Does not know : 55

In CAPD, the patient comes full stomach, the peritoneum is drained into the service in a CAPD bag and the liquid inoculated on culture broth

YES : 110
NO : 29
Does not know : 54

The patient brings the drained bag home, and bacteriological sampling is performed on this bag

YES : 91
NO : 47
Does not know : 55

Only a test strip is taken from the drainage bag and if positive, antibiotherapy is started without culture

YES : 1
NO : 137
Does not know : 55

An exchange of CAPD is practiced in the service then drained, and the drainage liquid is seeded on culture broth

YES : 80
NO : 56
Does not know : 55

The contact time of the exchange carried out in the service before carrying out the bacteriological sampling is generally

Les than 2h : 25

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More than 2h : 84
No precise time recommended : 17
Does not know : 67

In addition to the cultivation in the service, the drainage bag is sent to the laboratory
YES : 8
NO : 128
Does not know : 57

You do not make culture in the service, you only send a sample of the full bag to the laboratory, in a sterile container
YES : 56
NO : 83
Does not know : 54

If the patient has received antibiotics, do you report it to the laboratory?
YES : 114
NO : 22
Does not know : 57

Do you immediately start antibiotics?
Yes after bacteriological sampling : 118
Yes without bacteriological sampling : 1
Wait for bacteriological results : 19
Does not know : 54

Your bacteriology laboratory is
In your institution : 54
In another institution but always the same : 64
In diferent other institution, changing : 11
Does not know : 9

In what approximate timeframes do your samples arrive at the laboratory?
Les than 15 min : 56
Between 15 min et 60 min : 65
Between 60 min et 120 min : 11
More than 120 min : 9

diversity in the responses, witnessing non-unified protocols and within the same center, is probably the explanation for the large variations in sterile peritonitis rates from one center to another. In this study, we have not sought to correlate these rates based on the preliminary survey responses, some of which have been ambivalent. However, the simple counting of the responses highlights the great difference in practices. This indirectly confirms other studies carried out by the RDPLF that testify to the importance of the center effect (3, 4). Thus, in the study by Vernier et al (5) on all RDPLF patients, antibiotic prophylaxis during the placement of a peritoneal dialysis catheter was seen to be effective, whereas in the article by Lanot et al (3) on the same database, it became ineffective when the center effect was taken into account in the statistical model. Contrary to these results, we observed a certain homogeneity in the whole database concerning the incidence of peritonitis, which varies little from one center to another and has become weak, around one episode every 32 patient-months in recent years (http://www.rdplf.org/infections/880-infections-2016.html). The improvement of the connectology and the widespread use of hydro-alcoholic solutions are probably contributing factors. Thus, an external process applied to all cases produces a common result, the decrease of the frequency of peritonitis; on the other hand, sampling techniques and bacteriological cultures, specific to each center and not universally standardized,

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lead to a very variable identification rate of micro-organisms. The absence of identification may then be the source of inadequate antibiotic therapy, leading to failure and recurrence.

CONCLUSION

While the overall rate of aseptic peritonitis identified in the RDPLF remains consistent with the recommendations of the ISPD, there is great inter-center variability, with germ-free peritonitis rates ranging from less than 5% to more than 50%. The sampling conditions, the delay in sample delivery to the laboratory and the bacteriology technique itself are probably the cause. Although we do not present conclusions regarding the best sampling technique in this study, the recommendations of the Strasbourg bacteriological team to ensure a high identification percentage (Antoine Grillon et al.) do appear in this issue.

CONFLICTS OF INTERESTthe authors declare that they have no conflict of interest in this article.

REFERENCES

1 - Philip Kam-Tao Li, Cheuk Chun Szeto, Beth Piraino, Javier de Arteaga, Stanley Fan, Ana E. Figueiredo, Douglas N. Fish, Eric Goffin, Yong-Lim Kim, William Salzer, Dirk G. Struijk, Isaac Teitelbaum and David W. Johnson. ISPD Peritonitis Recommendations: 2016 Update on Prevention and Treatment. Perit Dial Int September-October 2016 vol. 36 no.5 481-508
doi: 10.3747/pdi.2016.00078 (texte français : http://www.pdiconnect.com/content/36/5/481/suppl/DC2)

2 - Verger C, Ryckelynck JP, Duman M, Veniez G, Lobbedez T, Boulanger E, Moranne O, Fabre E.French peritoneal dialysis registry (RDPLF): outline and main results. KidneyInt Suppl. 2006 Nov;(103):S12-20.DOI: https://doi.org/10.1038/sj.ki.5001911

3 - Lanot A, Lobbedez T, Béchade C, Verger C, Fabre E, Vernier I. Efficacité de l'antibioprophylaxie à la pose du cathéter de dialyse péritonéale quand l'effet centre est pris en compte. Etudes des données issues du RDPLF. Néphrologie et Thérapeutique 2016; 12 (5) :316

4 - Guillouët S, Veniez G, Verger C, Bechade C, Ficheux M, Uteza J, Lobbedez T: Estimation of the center effect on earlyperitonealdialysisfailure : amultilevelmodellingapproach. Perit Dial Int 2016; Apr 4. pii: pdi.2015.00245.

5 - I.Vernier, E.Fabre,T.Lobbedez, M.Dratwa, C.Verger. Le module cathéters du RDPLF a 20 ans : analyse descriptive et résultats. Néphrologie & Thérapeutique 2017 ; 13 (5) : 273.
https://doi.org/10.1016/j.nephro.2017.08.

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