

Peritoneal videodialysis: first Italian audit

Articoli originali

Loris Neri¹, Simonetta Caria², Katia Cannas², Roberto Scarpioni³, Alessandra Manini³, Chiara Cadoni⁴, Rosella Malandra⁵, Ines Ullo⁶, Giuseppe Rombolà⁶, Maurizio Borzumati⁷, Francesca Bonvegna⁷, Giusto Viglino¹

1 Nephrology and Dialysis, "Michele e Pietro Ferrero" Hospital, Verduno (CN), Italy
2 Nephrology and Dialysis, Cagliari Local Health Authority, Quartu Sant'Elena
3 Nephrology and Dialysis, Piacenza Local Health Authority
4 Nephrology and Dialysis, Nostra Signora di Bonaria Hospital, San Gavino Monreale
5 Nephrology and Dialysis, Teramo Hospital
6 Nephrology and Dialysis, Sette Laghi Local Health Authority, Varese
7 Nephrology and Dialysis, Verbano Cusio Ossola Local Health Authority, Verbania



Loris Neri

Corresponding author:

Loris Neri
UO Nefrologia e Dialisi, Ospedale "Michele e Pietro Ferrero"
Strada del Tanaro 7/9 – CAP 12060 Verduno (CN)
Tel. 0172.140.8271
Cell. 333.3935557
E-mail: lorisneri1960@gmail.com

ABSTRACT

Conceived and developed since 2001 at the Alba Center, Videodialysis (VD) was used initially to prevent dropout in prevalent PD patients by guiding them in performing dialysis (VD-Caregiver). Subsequently, its use was extended to the clinical follow-up of critical patients (VD-Clinical), problems relating to transport to the Center (VD-Transport), and since 2016 for training/retraining all patients (VD-Training).

Since 2017 other Centers have employed VD using modalities analyzed in this paper.

Methods: the paper reports the findings of an Audit (February 2021) of the Centers using VD on 31-12-2020.

The Centers provided the following information:

- the characteristics of the patients using VD;
- the main and secondary reasons for using VD, considering nursing home (VD-NH) patients separately;
- VD outcomes: duration, drop-out, peritonitis, patient/caregiver satisfaction (minimum: 1 – maximum: 10).

Results: VD, which began between 09-2017 and 12-2019, has been used in 6 Centers for 54 patients at 31-12-2020 (age:71.8±12.6 years – M:53.7% – CAPD:61.1% – Assisted PD:70.3%).

The most frequent reason has been VD-Training (70.4%), followed by VD-Caregiver (16.7%), VD-NH (7.4%), VD-Clinical (3.7%), and VD-Transport (1.9%), with differences between Centers.

VD-Training is used most with self-care patients (93.8% – p<0.05), while with patients on Assisted PD it is associated with secondary reasons (95.7% – p<0.02). VD-Training (duration: 1-4 weeks) has always been completed successfully.

No peritonitis was reported; satisfaction was 8.4±1.4.

Conclusion: videodialysis is a flexible, effective, safe, and valued tool that can be employed using various modalities depending on the choice of the Center and the complexity of the patient.

KEYWORDS: Peritoneal Dialysis, Assisted Peritoneal Dialysis, Telemedicine, Videodialysis, Training

Introduction

To overcome the psychological, cognitive, and physical barriers to self-care which limit the use of Peritoneal Dialysis (PD), in particular in the elderly, a remote care system was devised and developed at the Alba Center. Called Videodialysis (VD), and described in detail in a recent paper [1–3], the system has proved to be effective as a virtual caregiver in overcoming the barriers to self-care in PD [1].

History of videodialysis

The experience with VD began on 01/10/2001 (Figure 1), when it was devised and used in order to prevent the dropout of prevalent patients who were no longer able to perform the PD procedures without assistance.

In view of the excellent results achieved, the use of VD was extended from 01/01/2009 to all the incident patients or their caregivers who from the outset showed barriers to performing PD without assistance. Used in this way, a nurse in the Center – who can be referred to as a Videocaregiver (VD-Caregiver) – “guided” the patient or caregiver remotely in the performance of the dialysis procedures (CAPD exchanges, or APD setup, connection and disconnection), thereby extending the use of PD and/or avoiding recourse to self-sufficient caregivers at a greater social or economic cost for the family [2].

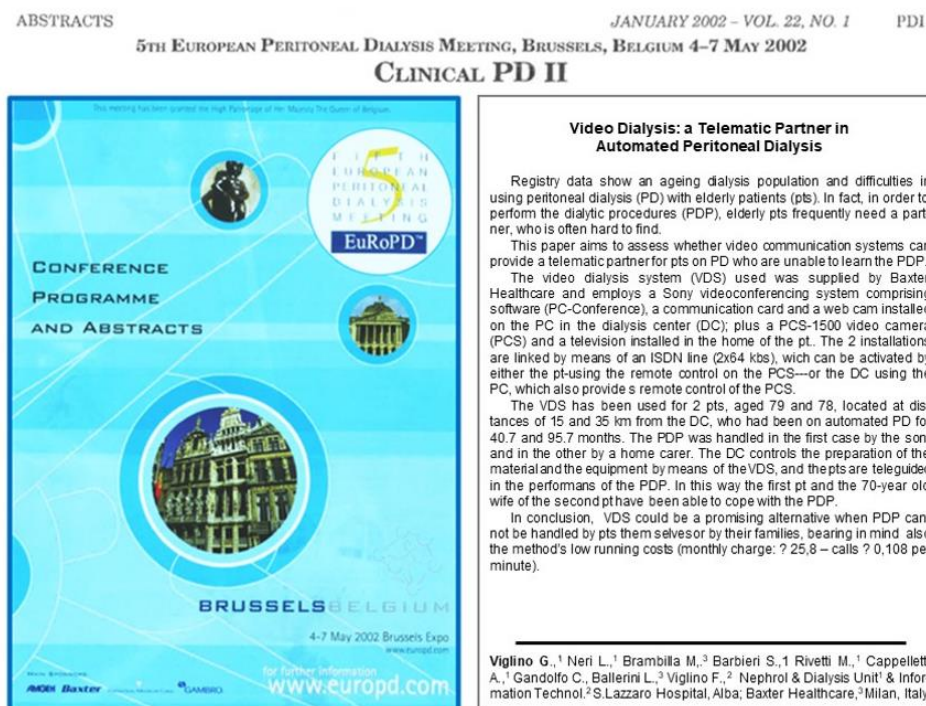


Figure 1: Abstract EuroPD Bruxelles, 4-7 May 2002. *Peritoneal Dialysis International* Vol 22 (1): 138.

Subsequently, VD was also recommended in the event of difficulty in accessing the Center due to distance or confinement to bed (VD-Transport), and clinical conditions requiring its frequent monitoring (VD-Clinical).

The difference between these 3 modes of use lies in the frequency of the connections with the Center: in the case of VD-Caregiver, for all exchanges (CAPD) or all dialysis sessions (APD); in the case of VD-Transport, just for visits or check-ups; and with medium frequency, depending on the seriousness of the clinical conditions or monitoring needs, in the case of VD-Clinical.

Over time it was observed that some patients using VD-Caregiver became independent in the performance of the dialysis procedures. This observation suggested that it could be more effective to provide customized training of the required duration in the performance of the procedures using VD.

This led to VD being used for the training of all patients (VD-Training) from 01/08/2016. Based on the results of the training, it was decided whether complete or partial support should be maintained with VD, or if patients could be left to perform the dialysis on their own.

To make the carrying out and evaluation of training more effective, an “expert training system” was devised and then applied from 01/11/2018 [3].

This experience, which has been outlined here, is also the story of a technological evolution that was described in detail in the paper cited previously [1].

Uses of videodialysis

VD can be employed in different situations and contexts, for different intended users, and in a variety of places.

Contexts: training in dialysis procedures (VD-Training); “permanent” support in the performance of dialysis procedures (VD-Caregiver); the intensive follow-up of patients with critical clinical conditions (VD-Clinical) and the follow-up of patients with difficulty in accessing the Center (VD-Transport).

Intended users: patients with or without barriers to PD; caregivers with or without barriers to PD; healthcare workers.

Places: home; Nursing Homes (NH). In NHs, critical clinical conditions often coexist with transport difficulties (patients confined to bed, the use of dedicated personnel and means) and the need for training and repeated retraining of healthcare workers due to high staff turnover.

The Alba Center’s experience relating to 57 patients (mean age 70.8 years – M 63.2% – APD 56.1%) during the period 01/01/2014-31/12/20 is summarized in Table 1 and Figure 2.

From 2017 VD began to be used in other Centres as well, initially in the form of VD-Caregiver.

Subsequently, every single Center decided on which modes of VD to use, partly in consideration of the outbreak of the COVID pandemic.

VD	PATIENTS (no.)	DURATION (months)	DEATHS (no.)	TRANSPLANT (no.)	DROP-OUT (no.)	PD WITHOUT VD (no.)	IN VD (no.)
TRAINING *	28	0.25–0.75	0	2	0	26	0
CAREGIVER	14	17.4±11.7	1	3	5	4	1
CLINICAL/TRANSPORT	6	13.8±11.6	2	0	0	1	3
NH **	9	14.4±15.3	6	0	3	0	0

Table 1: Experience with Videodialysis (VD) at Alba in the period 01/01/2014 – 31/12/2020 relating to 57 patients. Duration and reasons for ending the use of VD in relation to mode of use. VD-Clinical and VD-Transport were considered together due to the limited number of patients and the association between the two conditions. D-NH was considered separately because the reasons for its use are different, and all equally important.

* VD-Training was used in 28 patients for 35 Training courses. In 2 cases the Training was interrupted due to Transplant. The duration of VD-Training was shown to be between 1 and 3 weeks (0.25-0.75 months). For the other modes, the duration is expressed as mean ± SD.

** Drop-out includes 1 case of ending PD due to recovery of renal function

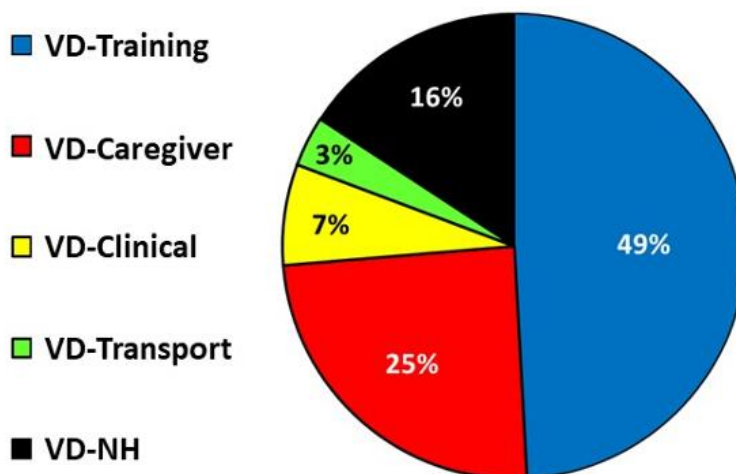


Figure 2: Reasons for the use of VD in Alba (Patients: 57 – Average age: 70.8 years – M: 63.2% – APD: 56.1%).

Objectives

The objective of this paper was to evaluate this initial multi-center experience over the period 01/09/2017-31/12/2020, in particular with regard to the reasons for using VD and the results achieved.

Materials and methods

An audit of the Centers using the VD system was conducted on 04/02/2021.

Each Center provided its data relating to:

- number of patients and their general characteristics;
- characteristics of the intended users of the VD (patient, family, or paid caregiver, NH);
- reasons for the use of VD, which could be the following:
 - training (VD-Training)
 - caregiver (VD-Caregiver)
 - clinical (VD-Clinical)
 - distance or difficulty in accessing the Center (VD-Transport)
 - location in NH (VD-NH)
- VD outcomes:
 - reasons for any discontinued use
 - duration of its use
 - peritonitis
 - user satisfaction (patient/caregiver) expressed on a scale of from 1 (minimum) to 10 (maximum)

Since there could be several reasons for the use of VD, Centers gave the main reason plus any secondary reasons which had contributed to the decision to use the system. VD-NH was considered separately since more than one equally important reason coexisted for the use of VD with these

patients (training of many nurses with high staff turnover, precarious clinical conditions, difficulty of transporting patients generally confined to bed).

The paper reports the results of the above aspects of this initial multi-center experience.

Statistical comparison by means of the Chi-square test was limited to analyzing the main reasons for the use of VD and – for VD-Training only (the most numerous group) – to the presence of any secondary reasons dependent upon patients' self-care ability.

Results

Participating Centers

Table 2 lists the Centers which took part in the Audit, together with the training site, frequency of home visits and date on which the experience with VD began for each Center.

CENTER	USUAL TRAINING LOCATION	HOME VISITS	START OF VD
Cagliari	Home	At the start, then every 2-3 months	September 2017
Piacenza	Center	At the start, then every 2-3 months	March 2019
Sanluri	Initially in Center (7 days), then at home	At the start, then if necessary	June 2019
Teramo	Initially in Center (3 days), then at home	At the start, then if necessary	April 2019
Varese	Initially in Center, then at home in some cases	Never	March 2018
Verbania	Home	At the start, then if necessary	December 2019

Table 2: Participating Centers: training site, frequency of home visits and Videodialysis start date.

Patients

Overall, VD was used for 54 patients, 33 of whom were on CAPD (61.1%) and 21 on APD (38.9%). The mean age was 71.8±12.6 years, but varied considerably from center to center.

Of the 54 patients, 16 (29.6%) performed the dialysis procedures independently, while 38 (70.4%) were on various modes of assisted PD (Table 3). In the former, the intended user of the VD was the patient, while in the latter it was the caregiver.

	NO.	AGE	M	CAPD	APD	SELF-CARE	ASSIST. PD
Cagliari	14	69.2±10.6	7	11	3	5	9
Piacenza	7	79.9±7.0	4	2	5	0	7
Sanluri	1	61	1	1	0	1	0
Teramo	12	65.6±14.1	6	7	5	7	5
Varese	8	74.4±5.3	4	6	2	0	8
Verbania	12	75.3±15.0	7	6	6	3	9
ALL (N°)	54	71.8±12.6	29	33	21	16	38
%			53.7	61.1	38.9	29.6	70.4

Table 3: Number of Videodialysis patients and their characteristics, divided by Center.

Assist.PD = Assisted PD: family member, carer, NH.

Reasons for using VD

Table 4 gives the main reasons for the use of VD in relation to the degree of patient self-care ability.

MAIN REASONS FOR USE OF VD							
	NO.	AGE	TRAINING	CAREGIVER	CLINICAL	TRANSPORT	NH
Self-care	16	61.9	15	0	0	1	0
Self-care with VD	1	67.0	0	1	0	0	0
Family CG	28	76.4	19	8	1	0	0
Carer CG	5	73.2	4	0	1	0	0
NH	4	78.3	0	0	0	0	4
		ALL (N°)	38	9	2	1	4
		%	70.4	16.7	3.7	1.9	7.4

Table 4: Main reasons for the use of Videodialysis broken down by degree of PD management ability.

- Self-care: self-managed PD
- Self-care with VD: self-managed PD using VD-Caregiver
- Family CG: PD assisted by a family member
- Carer CG: PD assisted by a paid carer
- NH: PD assisted by a nurse

VD-NH was considered separately because there are different reasons for its use, all contributing equally in importance.

The main reason for using VD was VD-Training in 38 patients (70.4%), followed by VD-Caregiver in 9 patients (16.7%) and location in an NH for 4 patients (VD-NH 7.4%). VD-Transport and VD-Clinical were grounds for using VD in 1 and 2 patients respectively.

The reasons for using VD proved to be very different among the various Centers (Figure 3).

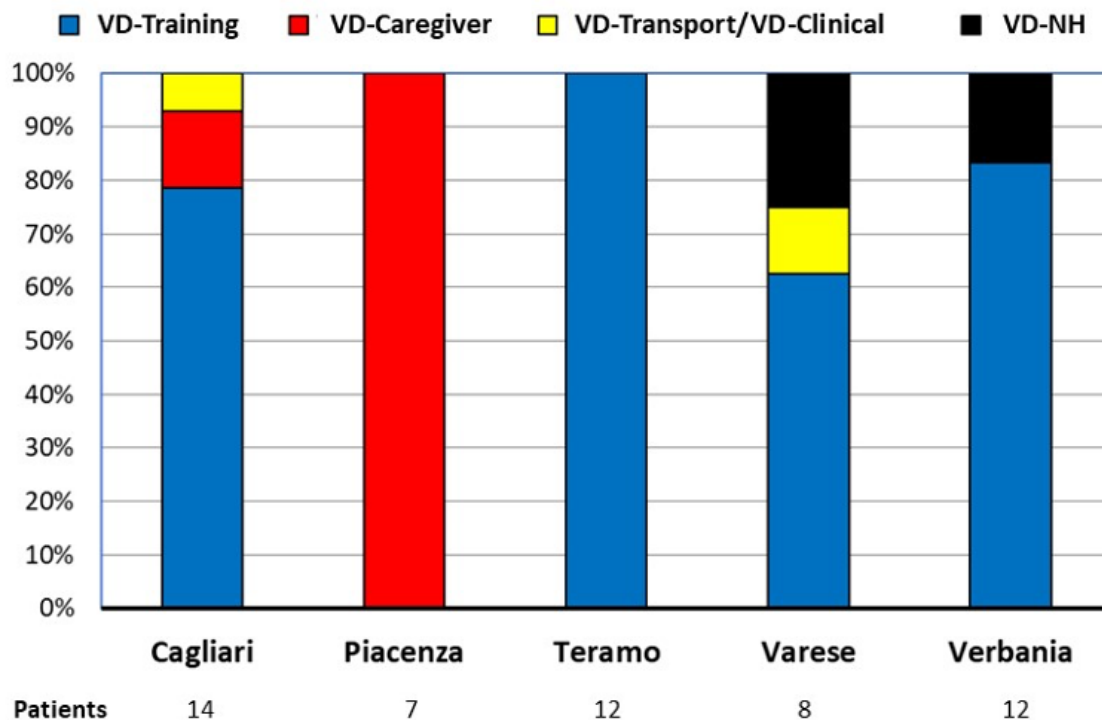


Figure 3: Mode of use of Videodialysis in the 54 patients in the Multi-Center Audit divided by Center. (Sanluri: not given as the Center has only 1 patient).

Training. VD-Training was given as the main reason for its use in 15 of the 16 self-care patients (93.8%) and for 23 caregivers of the 38 patients on assisted PD (60.5% – $p < 0.05$) (Figure 4A). In 8 of these 15 self-care patients (53.3%) and 22 of the 23 on assisted PD (95.7% – $p < 0.02$) (Figure 4B), secondary reasons were also given for using VD. In 70.0% of these 30 patients, the secondary reasons were clinical, and in 3.7% they were related to transport difficulties.

VD-Training was used in 26 incident and 12 prevalent patients respectively: in 6 cases due to changes in their dialysis treatment (5 due to a switch from CAPD to APD, and 1 due to management of antibiotic therapy for peritonitis), in 3 cases for retraining (1 following peritonitis, and 2 for other issues that required verification of self-care ability), in 2 cases due to the need for a caregiver, and in 1 case due to a change in caregiver. Of the 12 prevalent patients, 10 belonged to a single Center (Teramo).

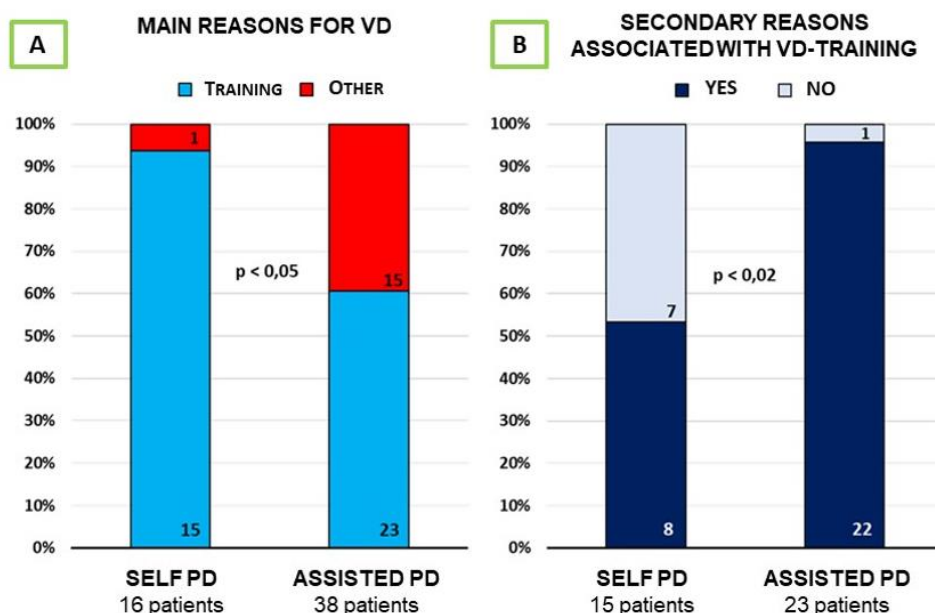


Figure 4: A: Main reasons for the use of Videodialysis in Self-care and Assisted PD patients B: Secondary reasons associated with VD-Training in Self-care and Assisted PD patients

Caregiver. VD-Caregiver was used in 9 patients, 7 of whom belonged to a single Center (Figure 3) which only employed the system in this mode. In 8 cases, the intended user was a Family Caregiver. The secondary reasons were clinical in 8 cases, and transport issues in 3 patients.

Distance or transport difficulties. VD-Transport was used in 1 patient due to the distance from the Center.

Clinical. VD-Clinical for follow-up was used for 2 patients on assisted PD: 1 terminal, and 1 in a Group Home. The secondary reasons were psychological barriers to self-care in the first case, and the need to provide Training to more than one caregiver over time in the second.

VD-NH. The use of VD in NHs involved 4 patients: 3 with VD-Training, and 1 with VD-Caregiver. It was difficult to distinguish between main and secondary reasons for VD in these patients. As a matter of fact, they all had barriers to self-care which could not be overcome, while there were clinical grounds (VD-Clinical) in 3 patients, and 2 were bed-ridden (VD-Transport).

Outcomes

VD Follow-up. This is shown in Table 5.

The duration of VD is given in relation to the different modes of use. In all 38 cases of VD-Training, the use of VD ended when the training came to a successful conclusion.

Of the remaining 16 patients, in 8 the use of VD ended due to death, 7 continued PD without VD, and 1 was still on PD with VD-Caregiver.

VD	PATIENTS (no.)	DURATION (months)	DEATHS (no.)	PD WITHOUT VD (no.)	IN VD (no.)
TRAINING *	38	0.25 – 1.0	0	38	0
CAREGIVER	9	6.7±5.6	5	3	1
CLINICAL/TRANSPORT	3	12.7±13.1	2	1	0
NH	4	1.0±0.6	1	3	0

Table 5: Duration (mean±SD) and outcomes (patients, number) of Videodialysis (VD) in its different modes of use. Compared to Table 1, cases of Transplant and Drop-out are not given. VD-Clinical and VD-Transport are considered together due to the limited number of patients.

* The duration of VD-Training was shown to be between 1 and 4 weeks (0.25-1.0 months). For the other reasons, the duration is expressed as mean±SD.

Peritonitis. No cases of peritonitis were recorded during the use of VD.

Satisfaction questionnaire. Patient satisfaction was evaluated by 5 Centers in relation to 39 patients. The average score was 8.4 ±1.4.

The average scores reported by patients in the single Centers are given in Figure 5.

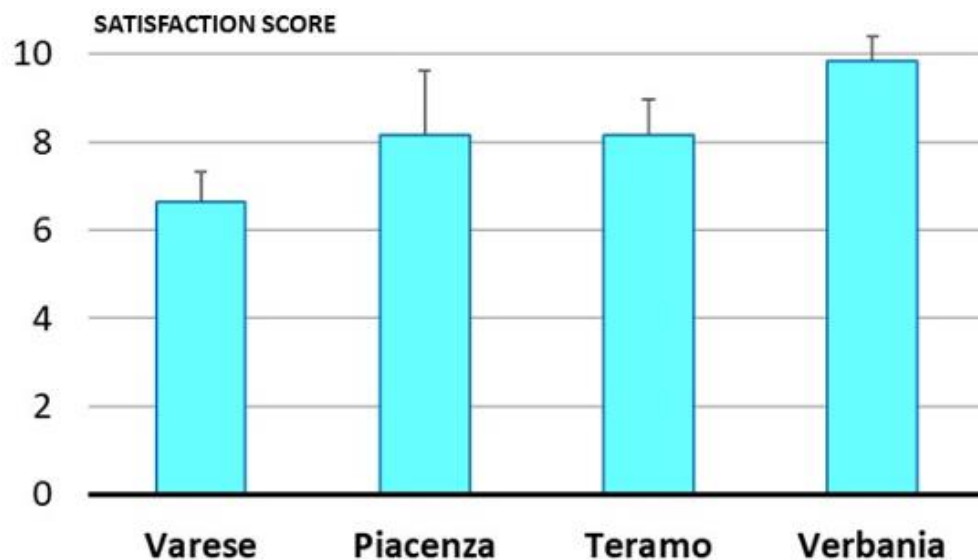


Figure 5: Results of the satisfaction questionnaire (min = 1 – max = 10). (Sanluri: not given as the Center has only 1 patient, score = 8).

Discussion

The most frequently used mode of VD is VD-Training for incident patients starting on PD. However, it was used almost exclusively by one Center for prevalent patients (83%) changing method or caregiver. In the Teramo and Verbania Centers, this mode of use coincided with the spread of the pandemic, which may have incentivized the use of telemedicine services.

On the other hand, the VD-Caregiver mode was used in 78% of cases in only one Center (Figure 3). These differences can be explained by the different policy applied by the Center to a method of care for which there was no previous experience other than that of the Alba Center (Figure 1), where its use had initially been limited – due to the technological limitations of the equipment and telecommunications systems – to patients who were already on PD in order to avoid the dropout.

Despite the limitations of an audit, this initial experience shows the considerable flexibility of a system that can be used in different ways with patients who require different levels of care intensity.

Indeed, the main reason for the use of VD in self-care patients is VD-Training (94%), while other reasons were given for choosing VD in 39% of the patients on assisted PD (Figure 4A). Furthermore, in 97% of the patients on assisted PD in VD-Training there were other secondary reasons that made recourse to VD necessary (Figure 4B).

The duration of the use of VD depended on its mode of use; in the case of VD-Training, the duration varied between 1 week and 1 month, and is consistent with Alba's experience (Table 5 vs Table 1).

The effectiveness of VD-Training is demonstrated by the successful completion of all the training courses carried out with VD (Table 5).

For the VD-Caregiver, VD-Clinical, and VD-Transport modes, conclusions cannot be drawn on duration and reasons for dropout due to the data available and the limited number of cases. In the case of VD-NH, the average duration of a stay in an NH with VD was much lower than in Alba's experience (Table 5 vs Table 1). This can be attributed to a different use of VD-NH: in the Audit, for patients who were terminally ill or placed temporarily in a facility; at Alba, for patients who were nonterminal and on permanent placement in an NH.

The safety of the system is supported by the absence of peritonitis during the use of VD. However, no further conclusions can be drawn due to a lack of post-training follow-up data.

Average patient/caregiver satisfaction with VD, expressed on a scale of between 1 and 10, was shown to be high (8.4 1.4), with differences between Centers (Figure 5).

Conclusions

Videodialysis is a flexible, effective, safe, and valued tool that can be used in different ways depending on Center choice and patient complexity. Furthermore, the use of VD may have been positively incentivized by the need to reduce access to Centers during the COVID pandemic.

Acknowledgments

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