Analysis of the factors conditioning the diffusion of peritoneal dialysis in Italy

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Abstract

Background. The diffusion of peritoneal dialysis (PD) in Italy is lower than expected on the basis of indications and contraindications reported in literature.

Methods. To analyse the factors influencing the use of PD in Italy, we used data from the first National Census of the Italian Society of Nephrology relating to 9773 incident patients (Incid HD+PD) in 2004 and 43293 prevalent patients dialysed in 658 centres at 31/12/2004 (337 public centres, 286 private centres, 12 paediatric centres, 15 research or religious institutions and 8 unspecified).

Results. The percentages on PD of total incident (IncPD%) and prevalent dialysis patients (PrevPD%) were 15.9% and 10.3%, respectively with considerable variations from region to region and from centre to centre. The IncPD% was higher in regions with fewer patients on dialysis in private centres. In the private centres, the IncPD% was 0.4%. Of the 325 non-paediatric public centres, 116 (35.7%) do not use PD: compared with the 209 centres which do, these centres have a lower mean IncHD+PD and PrevHD+PD per centre (13.0±12.3 vs 28.6±18.0 – 51.8±35.7 vs 117.3±66.4 patients, P<0.0001), and more haemodialysis (HD) stations available (3.0 vs 3.5 patients per HD station, P<0.0001). However, the significant influence of cultural and motivational factors on the use of this method is demonstrated by the fact that it is used by 34% of the smaller non-paediatric public centres, and is not used by 19% of the larger non-pediatric public centres.

Keywords: end stage renal disease; haemodialysis; healthcare; modality selection; patient preferences; peritoneal dialysis; patient education; renal replacement therapy; survival

Introduction

The diffusion of peritoneal dialysis (PD) varies extremely from country to country, with haemodialysis (HD) clearly predominating in most cases [1,2]. Since data from registers and various studies show no significant differences in survival rates between HD and PD [1,3–9], the differences in the diffusion of PD may be due to factors associated with the choice of modality and/or drop out rates. The technique-related drop out rate is known to be higher in PD than in HD [1,3,4,10]. However, the importance of the choice of modality in influencing the lower penetration of PD is confirmed by a parallel trend in the incidence and prevalence of PD, which—in most countries—are lower than those of HD [1,2,11].

One treatment may be preferred to another on clinical grounds, or for non-clinical reasons such as psychological, social and aptitude factors, which are more significant where a home-based, self-administered treatment such as PD is concerned. According to the data reported in literature [12–16], indications to PD are clinical in 1–15% of patients, and non-clinical in 0–3% of cases. Contraindications to PD, on the other hand, are represented by clinical factors in 4–17% of cases, and non-clinical factors in 1–21% of cases. The balance between indications and contraindications to PD varies between +1.4% [12] and –14.3% [13] for clinical factors, and between –1.3% [13] and –20.0% [12] for non-clinical factors. Considering both clinical and non-clinical factors, as well as indications and contraindications, a choice against PD may occur in at most 23.5% of cases [12–16].
If, therefore, the choice of treatment is influenced by the above factors alone, and not by a preference of patients or doctors for one type of modality, we should expect a PD incidence of at least 35–40%. Since a similar percentage is only found in certain countries, while in the others the incidence of PD is decidedly lower, there are grounds for assuming a negative attitude on the part of patients and/or family members towards this modality.

This negativity seems to be associated fundamentally with inadequate information on the various dialysis options during pre-dialysis. Indeed, published data seem to confirm that PD is chosen by 48–58% of patients who are not conditioned by clinical and non-clinical factors, and who have been provided adequate information on the dialysis treatment [13,14,17]. This is more likely in early-referral patients, although adequate information supplied following the commencement of the dialysis treatment seems to nullify the negative effect of late referral [13]. On the other hand, insufficient or a complete lack of information also results in less likelihood of PD being chosen in early-referral patients too [18]. In the end, the different diffusion rate for PD is conditioned by the choice of doctors on whether to inform, propose and use this modality.

According to Nissenson et al. [19], their attitude can be conditioned by economic and cultural factors. Of importance among the economic factors are both the country’s wealth and availability of resources, and the benefits for the doctor or for the facility in terms of reimbursements and the utilization of investment made for the setting up of a dialysis centre. Significant among the cultural factors are educational aspects relating to health workers, and the customs, social conditions and cultural traditions of the patients and their families. Furthermore, Nissenson et al. observed how PD diffusion in Italy varied considerably among different regions, and was low not only in private centres, but also in public facilities, suggesting that the use of PD is conditioned by non-economic factors.

The purpose of this study was to analyse the factors that affect the variability in the penetration of PD in Italy among different geographical areas and centres.

Materials and methods

The data collected by the First National Census organized by the Italian Society of Nephrology were used for this study. This census gathers aggregate data, for all Italian centres, on structural and human resources, organizational aspects and activities which are not taken into consideration by the Italian Dialysis and Transplant Register (RIDT). The incidence data relate to 2004, and the prevalence data to 31/12/2004.

The census covered all the 658 Italian centres, including 337 public, 286 private, 12 paediatric centres (one of which was private, giving a total of 287 private centres), 15 others with different legal status (research or religious institutions), and eight unspecified. Figure 1 shows the distribution among the Italian regions of the different types of centres. These centres were supplemented by 303 satellite centres which were taken into account in the evaluation of the overall number of HD stations.

To assess the use of PD, the number of new patients admitted to this renal replacement therapy during 2004 (IncidPD) was compared with the total number of admissions to PD and HD (IncidPD+HD) over the same period ([IncidPD%=(IncidPD/IncidPD+HD)×100]). In addition, the total number of patients on PD at 31/12/2004 (PrevPD) was compared with the total number of patients on renal replacement therapy (PrevPD+HD) as of the same date ([PrevPD%=PrevPD/(PrevPD+HD)×100]).

The occupancy of HD stations was assessed by relating prevalent patients at 31/12/2004 (PrevHD) to available HD stations (SHD) in centres, including their satellite services, (PrevHD/SHD). The ratio between incident and prevalent patients in PD (IncidPD/PrevPD) was used as an indirect drop-out index.

The statistical analysis was applied to evaluate difference between groups by means of the Chi-square test.

Results

Over the course of 2004, 9773 patients were admitted to dialysis treatment, including 1557 (IncidPD%=15.9%) on PD; the patients on renal replacement therapy (HD+PD) at 31/12/2004 were 43,293, of whom 4461 were on PD (PrevPD%=10.3%) (Table 1). However the use of PD varies considerably from region to region (Figure 2).

Figure 3 shows the IncidPD% and the PrevPD+HD in the different Italian regions; the width of each column represents the percentage of PrevPD+HD in a given region compared with the total number of Italian
Factors conditioning PD diffusion

Factors distinguishing centres not using PD were smaller in size in terms of both mean IncidPD+/HD per centre (13.0 ± 12.3 patients vs 28.6 ± 18.0; \( P < 0.0001 \)) and mean PrevPD+/HD per centre (51.8 ± 35.7 patients vs 117.3 ± 66.4; \( P < 0.0001 \)), and more availability of HD stations (PrevHD/StatHD ratio 3.0 vs 3.5 patients per station; \( P < 0.0001 \)). These data were then used to assess the influence of centre size on the choice of PD. Small centres (SC) were defined as those with an IncidPD+/HD ≤ 13 patients, and big centres (BC) those with an IncidPD+/HD > 13 patients. The IncidPD% in SC and BC was 12.7% and 20.2% (\( P < 0.0001 \)), respectively, while the PrevHD/StatHD was 2.78% and 3.52% (\( P < 0.0001 \)). Furthermore, patients were admitted to PD in 34% of SC and 81% of BC.

The 209 public centres which performed PD were divided on the basis of their mean PrevPD (19.8 ± 15.1 patients) into two groups, with PrevPD < 20 or ≥ 20 patients. The IncidPD/PrevPD ratio was significantly higher in the centres with a lower PrevPD (0.39 vs 0.33; \( P < 0.01 \)).

Discussion

The IncidPD% (15.9%) and PrevPD% (10.3%) show low diffusion of this renal replacement therapy in Italy. Considerable regional disparity existed within this national report, with IncidPD% varying between 2.4% (Basilicata) and 36.8% (Val d’Aosta), while PrevPD% ranged from 1.4% (Basilicata) to 19.5% (Liguria). One factor which seems to strongly influence this variability is the presence of private centres, especially when it exceeds 10% of the centres in the region. In fact, of the 286 HD private centres in the census, only five performed PD. This result is caused by legal provisions, in terms of both accreditation criteria and

Table 1. Numbers of incident and prevalent patients and PD incidence and prevalence rates based on type of centre

<table>
<thead>
<tr>
<th>Centres</th>
<th>Incident patients</th>
<th>Prevalent patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Num %</td>
<td>Total IncPD%</td>
<td>Total PrevPD%</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Total centres</td>
<td>658 100.0 9773 15.9</td>
<td>43 293 10.3</td>
</tr>
<tr>
<td>Non-paediatric private centres</td>
<td>286 43.5 1624 0.4</td>
<td>10 833 0.2</td>
</tr>
<tr>
<td>Non-paediatric public centres</td>
<td>325 49.4 7495 19.3</td>
<td>30 530 13.8</td>
</tr>
<tr>
<td>Non-paediatric public centres with PD</td>
<td>209 31.8 5988 24.1</td>
<td>24 522 16.9</td>
</tr>
</tbody>
</table>

Fig. 2. Incidence and prevalence of PD in the various regions of Italy.
reimbursement rates making PD less economically favourable than HD for private centres. This finding also confirms previous results on the inverse ratio in different countries between the greater importance of private centres in the health system and a lower diffusion of PD [20].

The use of PD also varies considerably from centre to centre, with size being an influential factor. In fact, the IncidPD% and PrevPD+HD% were lower in centres which did not perform PD than in centres where this therapy was made most use of.

In the SC, there was a lower occupancy of HD stations in terms of PrevPD+HD. Other authors [10,11,21,22] have pointed out how an increase in SlHD leads to less use of PD, as it entails the need to utilize the investment carried out to create them [19].

Within the Italian context, an IncidPD%+HD of lower than 13 patients seems to be a discriminantly critical measure for the use of PD. In this respect, it is quite clear that even where the admission rate to PD is not particularly high, a higher IncidPD%+HD caters to a PD prevalence rate which is capable of amortizing the employment of sufficient human resources to guarantee optimal management of the PD programme. On the other hand, it has been found how the PD drop-out rate can be reduced by having a programme which is more extensive in terms of either overall number of patients treated [23] or PrevPD [24,25]. As reported by other authors [24,25], in this study it was also found that a PrevPD of around 20 patients is able to distinguish centres with a higher or lower PD drop-out rate. The cultural and motivational input of health workers is a further important element which may influence the choice of a centre to use PD. This study found that 36% of all public centres and 19% of the BC in Italy did not use this modality, while 34% of SC did. This cultural and motivational factor may be attributed to a lack of familiarity with this therapy. This cultural gap results in turn in inadequate information to patients about PD during pre-dialysis. [18,26,27]. This lack of information contradicts the deontological principle of informed consent and the willingness of patients to take part in the choice of the dialysis treatment, as shown by the fact that only 4.9% of 773 patients without indications or contra-indications to PD or HD accepted that the dialysis modality was established by randomization [28].

In conclusion, PD diffusion in Italy is limited, but varies considerably in different geographical areas. The reasons for this variability can be attributed to the characteristics of the centres and to cultural factors. The use of PD is more limited in private and SC, where there is greater availability of HD stations. Besides these structural elements however, the use of PD in individual centres is also significantly influenced by
cultural and motivational factors relating to health workers.

Conflict of interest statement. None declared.

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