

See original article on page 629

Beyond survival in dialysis, we must change the paradigm

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Since the introduction of dialysis in the 1970s as a treatment for chronic kidney disease (CKD), when its use was limited to a small number of patients, until the present day, in which its use is widespread, its main objective has been to extend the lives of patients who suffer from this disease. Many studies have, on the basis of this concept, used different designs and tools to analyse the results of survival (SV) and establish which factors or treatment modalities yield the best results. However, over these more than 40 years, the possibility of improving SV has been conditioned by numerous factors, which could be grouped as follows: those related to technological advances, those associated with patients and those corresponding to health organisations. I will try to concisely analyse the impact that the progression and current situation of each of these groups has had on survival in dialysis, as well as proposing some alternatives to the current models that may have better results. To facilitate the discussion and support my proposals I will make some considerations using the publication, in this same issue, of the study by García-Cantón et al.¹ This study analyses, through a retrospective longitudinal cohort study, SV compared between peritoneal dialysis (PD) and haemodialysis (HD) in a group of 1100 incident patients (between January 2005 and December 2010) in accordance with the type of initial vascular access (arteriovenous fistula [AVF] or catheter). The study accurately and elegantly demonstrates that the differences between both techniques described by this group in favour of PD² exist because of patients who begin HD with a central venous catheter (HD-Cat) and that this difference does not exist when PD is compared with HD with developed vascular access (HD-AVF). Beyond this finding and the study's limitations, it contains data that we should reflect on and on the basis of which we should make proposals, such as those considered by these

authors, when they propose initial PD for those patients who have opted for HD but who lack developed vascular access.

KNOWN EVIDENCE

Factors associated with technological advances: the case of vascular access

It would be virtually impossible to count or establish a list of the large number of technological implementations in the field of dialysis and their impact on health outcomes of patients with CKD. These advances have been associated with the development of biological indicators (e.g. dialysis dose, inflammation markers, nutritional parameters, cardiovascular risk factors, etc.) that aim to more reliably predict the progression of patients and ultimately their SV. Interestingly, nephrologists themselves have played an important role in developing these advances and have participated in the design and implementation of various systems or techniques that have been used to resolve initial difficulties, but whose implementation would subsequently have a positive impact on patients' health.³ Willem Kolff and Belding Scribner were recognised for these achievements, receiving the 2002 Lasker Award for "Development of renal hemodialysis, which changed kidney failure from a fatal to a treatable disease, prolonging the useful lives of millions of patients".⁴ Today, it is the pharmaceutical industry and its research and development departments who are responsible for creating most of the technological innovations in the field of dialysis, which involves a significant investment of resources and effort. As already indicated, these advances have been associated with multiple analyses to establish the benefits or advantages of each dialysis modality. The conclusions drawn by these studies range from considering whether such a comparison is possible⁵ to confirming that both modalities yield equivalent results.⁶ One of the advances that involved a substantial change in the development of dialysis dates from 1966, which was the use of an AVF as a vascular access method.⁷ In the words of J. S. Cameron, AVF

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was “the most important contribution to increasing long-term survival in haemodialysis patients”. Since that time, much of the healthcare provided by nephrology services has focused on ensuring that all patients requiring chronic HD treatment have an AVF.⁸ To achieve this objective, various strategies were established and for a period of time, depending on the healthcare setting, nephrologists themselves took charge of its implementation, as well as participating, along with nursing staff, in the special care of the aforementioned AVF. However, over the last decade, the increasing incidence of CKD patients, their increased comorbidity, with a distribution of resources that are sometimes limited and other times inefficient, has prevented this objective from being realised. In these circumstances, tunnelled venous catheters were developed, which was a major technical innovation, as they allowed immediate vascular access with acceptable performance. However, their increasingly widespread use, together with the high rate and severity of complications with which they are associated, has generated a growing concern about their suitability.⁹ If we study the results of García-Canton et al.¹ we observe that the relative risk (RR) of mortality associated with HD-Cat was 2.270 as compared with PD, whereas no differences were observed between HD-AVF and PD patients. These results were maintained both on analysing patients with and without diabetes and when they were divided into two age groups. These data highlight the impact that having an AVF at the start of dialysis has on SV.

Another important finding is the high number of patients who began HD with a catheter (607/1100 patients, 54.7%), including 20%-49% of scheduled patients (data from two hospitals). In another recent study in the same geographical area, Anton-Pérez et al.¹⁰ show their concern about this situation, since 69% of patients started HD with a catheter (18% scheduled), which also had a negative impact on SV (RR 3.68). It must be noted that these data were the same in all autonomous communities. Therefore, in the Renal Disease Registry of Catalonia, where data of recent years are presented, there has been a stable number of patients starting with HD-AVF (40-44%) and a progressive increase in those start HD with a catheter (22-24%).¹¹ These results are a long way short of the quality of life proposals of the Sociedad Española de Nefrología (S.E.N.), which targets 80% of AVF for incident patients, although there are currently actions from the S.E.N. and the Vascular Access Working Group to achieve these targets.

FACTORS ASSOCIATED WITH PATIENTS: PATIENTS WITH CHRONIC KIDNEY DISEASE

Parallel to the development of dialysis and due to the universalisation of health care, along with socio-economic improvements, the epidemiological profile and characteristics of patients starting dialysis has been changing over the

years. In the initial stages, a lack of resources and limited availability of means led to the establishment of a number of criteria, not only medical, to determine who would be candidates for treatment with dialysis.¹² Subsequently, in 1972 the U.S. government considered CKD a disabling disease and dialysis as its form of treatment, as it extended the lives of patients.¹³ Subsequently, the possibility of dialysis treatment was extended and now is available to all patients who require it. As such, patient situations have become more complex, and patients are increasingly older and have more comorbidities, which has negatively influenced SV data. In the study by García-Canton et al.¹ we observe the impact of these factors on mortality. We note the high percentage of patients with diabetes (46-61%) and cardiovascular disease (43-62%), which is significantly higher in the HD-Cat group. Although, on analysis by subgroups, the factor that has the greatest impact on SV is the presence of a catheter. Special mention should be given to the high number of patients with diabetes in this series. This finding has already been referred to and it distinguishes the epidemiological profile from that of the population of the Canary Islands on dialysis.¹⁴ Given the difficulty of establishing advantages in SV for both techniques, especially in the first years of treatment, García-Canton et al.¹ considered whether it would be appropriate to base the treatment modality decision on other variables (e.g., patient preference, socioeconomic impact). This observation is highly topical, since on assessing the impact on health outcomes of any therapeutic action, it is not enough simply to refer to its effect on life expectancy, but the concept of quality is also relevant (QALYs: quality-adjusted life year or DALYs: disability-adjusted life year). This concept, along with the progressive increase in patients with high morbidity requiring dialysis, has led to the development and implementation of renal palliative care departments as a treatment option that ensures optimal care and quality for those patients in whom, for various reasons, we have opted for conservative treatment of their CKD.¹⁵

Factors associated with health organisations: peritoneal dialysis

Care for CKD patients is conceived and developed in health organisations. These are complex systems in which many agents participate directly or indirectly (for example, patients, families, healthcare professionals, managers, the pharmaceutical industry, scientific companies, etc.), which distinguishes them from other organisations.

Since its inception, our healthcare system has been based on the Beveridge model (funded by taxes) with universal coverage and public management. It has since evolved into the current situation, where after a decentralisation process, it is managed in each of the 17 autonomous communities, which are coordinated through the Inter-Territorial Health

Council. In this process, the public health offer has been supplemented by private healthcare, in a progressive manner and in different proportions, with the aim of improving the coverage and efficiency of healthcare. Treatment of CKD by dialysis is based on this mixed model,¹⁶ but in most cases, patients are assigned to a public hospital reference centre. To optimise the entire healthcare process until beginning dialysis, advanced chronic kidney disease (ACKD) departments were established, which since their introduction, have had a positive impact on the SV of patients starting dialysis on a scheduled basis compared with those who do not.¹⁷ However, at the present time, in order that these departments achieve their objectives, they must function better.¹⁷ García-Canton et al.¹ show data of ACKD departments of two hospitals and found that the percentage of patients with a scheduled start on dialysis was 53.7%-65%, which are quite acceptable values, especially if we consider the analysis period (2005-2010) and that this was not their objective.

In relation to these departments, I have already mentioned the alarming percentage of HD-Cat in scheduled patients, but I would like to discuss the rate of patients starting with PD (18-22% in the study), because, although these figures are adequate and have improved, it would be desirable for this trend to increase. In fact, these data are similar to those reported by the majority of CKDA departments, and as such, the S.E.N. and GAADPE have attempted to improve them. We cannot forget that 28 years ago, in a survey of 59 leading nephrologists, the latter proposed CAPD as a second class treatment,¹⁸ which contrasts with the current belief of 6595 nephrologists from different continents, 56% of whom consider home therapy to be more suitable and 49% consider PD to be the best initial option.¹⁹ García-Canton et al.¹ also propose PD as the initial modality for those who opt for HD and lack an AVF. There are many factors that could explain the difficulties of implementing this action and increasing the number of incident PD patients,²⁰ although it has been shown to be a highly efficient healthcare model,²¹ but the role of the Health System model of each country and their internal organisation is important in the distribution of the different forms of dialysis.²² The planning and organisation models also influence the situation of vascular access and as such, heterogeneous results have been reported that are far from the desirable objectives, in accordance with how healthcare is organised. The creation of Clinical Management Units that allow the actions of all agents involved in each healthcare process to be managed in an independent and coordinated manner, seems to be a measure that could result in the comprehensive care of patients with CKD, in an efficient way that encourages the sustainability of the Health System.

THE POSSIBLE ALTERNATIVES

In the current circumstances and bearing in mind the aforementioned evidence, it is appropriate to seek alternatives

that may improve the results of SV or correct the existing trend. It is surprising that 18 years ago Pérez Bañasco and Borrego⁸ warned about the seriousness of the vascular access situation and from then until now, this concern would be echoed by various groups, although there has been no substantial change in this situation. S.E.N., as part of the Strategic Plan against CKD, has implemented many actions to deal with this situation. I do not doubt that the following proposals, some general and others more specific, are already known, but I believe that they represent those that must be implemented immediately.

Prevent and stop the progression of kidney disease

We must assume that, instead of aiming to reform (or change) the health systems with the intention of ensuring sustainability, we should transform them into systems that have more to do with prevention and maintaining the population's level of health. This will make them more efficient and therefore, longer lasting. A message as simple as "the best treatment for kidney disease is to not have kidney disease" requires perfectly coordinated healthcare organisation, making such a complex task possible. Patient associations (ALCER) and the S.E.N. have already been successfully carrying out campaigns in this regard. Nevertheless, once the patient enters the healthcare setting, the solution revolves around early treatment and quick measures, although both situations are quite far from reality in our healthcare. The creation of healthcare units that are complementary to those already existing, whose only aim is to act against kidney disease to avoid its progression, has had encouraging results (departments for remission of kidney disease).²³ I am convinced that early diagnosis and therapies (for example, ultrasound, blockade of the renin-angiotensin system, etc.) with intensive follow-up and health outcomes as the objective (e.g., reducing the rate of new cases of CKD), will add value to our specialty and improve patients' health.

Guarantee patient safety

When we speak of safety, we refer to the absence or reduction, to a minimum acceptable risk level of suffering unnecessary damage in the course of healthcare (Source: AMSP/WHO: International Classification for Patient Safety v 1.1.2008). In relation to kidney patients and dialysis units, there is still much room for improvement, to the extent that our teams are trained to identify and assess risk situations through specific actions (reactive, such as the root-cause analysis and proactive, such as modal analysis of failures and effects), we will reduce our errors and increase efficiency.²⁴ Healthcare errors can occur in different settings, but those that occur in hospitals can have serious consequences (Agency for Healthcare Research and Quality; www.ahrq.gov), and as such, immediate action is necessary to change our guidelines for action against these errors.²⁵ Thus, in the case of catheters for HD, it is mandatory to incorporate measures such as zero

editorial comment

bacteraemia that guarantee a reduction in morbidity and mortality associated with their use.

Coordinate the actions of all agents

If we believe in the suitability of comprehensive healthcare for CKD, we must ensure perfect coordination of all agents and units involved in their healthcare, which will allow objectives to be achieved. In the setting of hospital healthcare this coordination is the responsibility of the heads of service. We know that any proposed change will encounter different degrees of resistance, so its success will depend on good management by healthcare professionals. For this they must assume a true leadership position (associated with the role of authority, not power),²⁶ transparent reporting and planning by agreement with the whole team. In this way, objectives such as all incident HD patients having an AVF at the suitable time²⁷ will be easier to achieve. In any case, we should not be unaware of the current reality, in which any specific proposal could be limited to a relationship of good intentions, unless it is accompanied by incentives of a different kind (we will discuss this statement below).²⁸ I agree with other authors that in the comprehensive healthcare of CKD, we must assume that all available treatment modalities (HD, PD, transplant and conservative) are interchangeable and their indication should be based both on medical criteria and those of other kinds.²⁹ This statement partially questions the need to make comparisons based solely on SV.

Establish alliances

Technological advances in the treatment of CKD come mostly from the pharmaceutical industry, but it has been through synergies with healthcare professionals that their implementation became possible. Proof of this is the recent study of on-line haemodiafiltration and its effect on SV.³⁰ The way forward is to innovate and as such we should form alliances, both with the industry and with other areas of knowledge (e.g. project e-nephro: Nephrology and Engineering). These alliances should be carried out with real planning and quality indicators in their development and objectives and include an economic evaluation of their implementation along with a regular review of their results (strategic plan). In the area of healthcare and due to the limitations inherent in public services, it is necessary to maintain agreements with private suppliers.¹⁶ Let us not forget that the target of our actions is our patients and their interest is centred exclusively in resolving their health problems (e.g. a reduction of the rate of CKD). Again, synergies based on agreed planning and quality are the way to optimise these actions to avoid individual interests that are detrimental to equality and the choice of the most suitable dialysis modality.²⁰

Encourage specific tasks

Professionalism is an inherent part of our healthcare culture³¹ and it is undeniable that thanks to it, most achievements in our profession have been obtained. In recent years and due, in a large part, to a government that has planned with short-term objectives in mind, our activity has been determined and systems have been expanded based on incentives.²⁸ This model, which on occasions is not well received, is one of the few tools available to us to manage our activity (e.g. recording the number of referrals). I believe that, if we adjust it to each context and we direct it towards health-based results instead of activity-based results, we would be able to achieve many objectives. In the current situation, we must reassess professionalism, encouraging more specific tasks and contributing to the implementation of good practices, reducing conflicts of interest and assuming the technical leadership that society needs.³¹

Promote home therapies

Currently, chronic diseases may be treated at home. The challenge facing us is to offer care to chronic patients, in an inefficient, centralised system in hospitals and in which the rate of visits to these departments is the highest in the European Union (8.1 compared with 5.5 medical visits annually per inhabitant; source Fedea report 2006. Promote a potential change in the health system. McKinsey & Company. www.cambioposible.es/sanidad). We have already highlighted the favourable opinion of nephrologists on home therapies.¹⁹ To achieve this situation, it is necessary, among other strategies to promote education to patients and their families, although the results of these actions are variable and depend on many factors.³² The S.E.N. and ALCER have actions and proposals aimed at educating and informing patients. The results of a recent study (in collaboration with industry) show that through a structured educational process with the use of tools that facilitate decision-making, a starting distribution of about 50% can be obtained in each dialysis modality.³³ It is undeniable that one of the keys to ensuring the sustainability of the system is to increase the responsibility of patients, professionals and managers.

At this point, we could say that, in the setting of comprehensive healthcare, the most widely used renal replacement therapy modality will be that which results in the best relationship between quality and efficiency. I would like to finish with the words of Richard Smith, of the Health Group, when he referred to health services, remembering that they “should be safe, evidence-based, patient-centred, efficiency, be sustainable and have a very clear philosophy of continuous improvement.” In my opinion, the challenge of creating a different future will be possible if we combine these proposals with a high dose

KEY CONCEPTS

1. Institutional and Professional Leadership by the heads of Nephrology Services for a Comprehensive Care of patients with CKD. Thus, we may coordinate the active participation of both patients and healthcare professionals, including managers, in the whole healthcare process.
2. Establish Healthcare Objectives based on Health Outcomes, including an appropriate balance between quality and efficiency with realistic planning, in which the Patient is the centre of our activity.
3. Renal Replacement Therapy Modalities (renal transplantation, haemodialysis, peritoneal dialysis and conservative treatment) must be understood as a healthcare continuum. They are interchangeable treatment alternatives and their indication will not only be based on medical criteria.
4. Patient Safety must be an inherent part of all our actions. CKD progression is determined by many factors and, as such, it is necessary to incorporate strategies that reduce the healthcare error rate, both in the hospital setting and at primary care level, through communication and analysis of each event.
5. Accept home treatment as a fundamental element of chronic patient care. CKD Home Therapies are part of this process, and as such, training must be provided for all healthcare staff. The use of structured educational models with tools that facilitate decision making will result in a more equitable and efficient distribution of resources.

of enthusiasm for our work, reduce uncertainty as much as possible and develop our resilience to adversity to the fullest.

Conflicts of interest

The authors declare that they have no conflicts of interest related to the contents of this article.

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