© 2011 Revista Nefrología. Official Publication of the Spanish Nephrology Society

Diagnostic and interventional nephrology: an opportunity for Spanish nephrologists

M. Rivera, C. Quereda

Nephrology Department. Ramón y Cajal Hospital. IRYCIS. Madrid, Spain

Nefrologia 2011;31(2):131-3

doi:10.3265/Nefrologia.pre2011.Feb.10825

Half-way through the 20th century, nephrologists were responsible for numerous milestones, leading us to modern nephrology as we know it today. Nephrologists have designed and developed instruments that are fundamental for our speciality, such as renal biopsy,[1] the first haemodialysis shunt,[2] double lumen catheters,[3] the first arteriovenous fistula for haemodialysis,[4] the first tunnelled catheter for peritoneal dialysis,[5] and laparoscopic catheter placing.[6] Furthermore, Dr J Holmes, considered the father of diagnostic ultrasound,[7] was also a nephrologist.

However, as dialysis treatment progressed, nephrologists stopped performing interventions on their patients, to the advantage of other specialities (surgeons and radiologists, mainly) yet to the detriment of overall patient care. A clear example is the significant increase in the number of patients that received dialysis through a permanent catheter or a synthetic bypass, compared with those that have received an arteriovenous fistula, during recent decades.[8]

Kidney patient care was therefore fragmented, being placed into the hands of other specialists, who did not fully understand the reality of kidney diseases. Furthermore, as reported by O'Neill,[9] we nephrologists started to spend more time on the telephone, asking for tests, than solving our patients' problems.

In 2000, a group of American nephrologists, aware of this controversial situation, decided to create the American Society of Diagnostic and Interventional Nephrology (ASDIN)[10] so as to defeat the apathy that had developed. Its objective was for nephrologists to regain leadership, promoting the appropriate application of their techniques, that they themselves had developed, and to improve nephrology patients' care. This Society strives to promote interventional nephrology within nephrology services and has presented an annual congress since 2005. It also has a section in the journal *Seminars in Dialysis*, where its original articles are published. Since 2004, the International Society of Nephrology created the Interventional Nephrology Committee with the aim of promoting and addressing issues related with this new discipline, such as healthcare provision and training.[11]

INTERVENTIONAL NEPHROLOGY IN THE WORLD

Diagnostic and interventional nephrology is expanding in the United States. This discipline is being included more frequently as a permanent feature of courses and congresses, such as the Annual Scientific Meeting of the American Society of Nephrology, which has been taking place since 2000.[12] Hospitals offering training under this subspeciality have also increased notably in North America. However, according to a recent survey published on this matter,[13] there still are not enough hospitals and even fewer are ASDIN-accredited.[14-16]

Interest is also growing in Latin America. Countries such as Puerto Rico, Peru, Brazil, Mexico, Colombia, Argentina and Venezuela have been incorporating interventional nephrology into their daily healthcare and in scientific meetings.[17,18] The Latin American Society of Nephrology and Hypertension considers interventional nephrology as a discipline in itself and has its own interventional nephrology advisory committee.[19]

Europe, on the other hand, is more interested in diagnosis than intervention, i.e. introducing ultrasound to nephrology. We can assume this fact because ultrasound has featured occasionally in European Dialysis and Transplant Association pre-congress courses. However, very few studies conducted by nephrologists are presented in congresses or published in the *Nephrology Dialysis and Transplantation* journal.

Correspondence: Maite Rivera
Servicio de Nefrología. Hospital Ramón y Cajal. IRYCIS.
Carretera de Colmenar km 9,100. 28034 Madrid. Spain.
mriverag.hrc@salud.madrid.org
mriverago@gmail.com

INTERVENTIONAL NEPHROLOGY IN SPAIN

This subspeciality has hardly been developed in Spain. Although we are aware that there are numerous interventional nephrologists in Spain and that several departments boast an ultrasound machine, very few have published their experiences on performing fistula for haemodialysis,[20] placing tunnelled catheters,[21,22] ultrasound-guided renal biopsy,[23] or peritoneal dialysis catheters.[24,25] However, there are brilliant, consolidated initiatives for diagnostic ultrasound for vascular access.[26]

Lastly, in recent years we have learnt that kidney disease is an independent cardiovascular risk factor, and if attended to at early stages, nephrologists may have more treatment variables available, crucially influencing patient survival and quality of life. Therefore, kidney patients' diagnosis and follow-up should not only involve examining renal anatomy, but also evaluate the cardiovascular risk, by measuring the carotid intima-media thickness, for example.[27-30] This aspect is being actively researched in an important Spanish multi-centre study, which is supported by the Spanish Society of Nephrology (S.E.N.).[31]

We have had a diagnostic and interventional ultrasound unit at the *Servicio de Nefrología* (Nephrology Department) of the Ramón y Cajal Hospital since 1991.[22-35] From this moment onwards, we have been able to examine our patients (those suffering from kidney diseases and transplant recipients) using conventional ultrasound, later implementing Doppler imaging. Our initial idea was to recover the renal biopsy technique, but, in our experience, incorporating these diagnostic procedures in the nephrology department's daily routine has been extremely useful. It is an important tool for diagnosing and monitoring patients suffering from clinical kidney diseases, high blood pressure, or receiving kidney transplants.

Since 1995, we have been surgically implanting catheters for peritoneal dialysis. Since 2010, we have been evaluating the vascular access using ultrasound (pre- and post-surgery) and placing transitory central catheters using real-time ultrasound. Lastly, in our department, we also perform minor surgery, such as removing Schon tunnelled catheters (which was previously performed by vascular surgeons), repairing peritoneal catheters and draining abscesses.

Interest with regards diagnostic and interventional nephrology is growing in Spain, something which is reflected in the number of courses taking place.[36,37]

DISADVANTAGES AND OBSTACLES

Our first obstacle is that we must overcome the assumption that we are stepping into other specialist's fields, which is not the case, as we are relieving other specialities of numerous examinations and interventions, which may be of the utmost importance to us, but are less of a priority for them. In either case, there should be consensus with regard to interventional nephrology throughout the hospital so that it benefits the patients.

Another disadvantage, in our opinion, is that more focus is given to interventional nephrology than other areas. In our hospital there is a nephrologist who organises the *Unidad de Nefrología Diagnóstica e Intervencionista* (diagnostic and interventional nephrology unit), which is integrated by other nephrologists from the department. Each one is not only responsible for a given nephrology area, but also performs interventions. Given that they are continuously in contact with their patients, techniques are performed more swiftly. We have standardised each and every one of the activities performed in our department to avoid outcome variability.

Lastly, excessive workload is one of the main reasons for diagnostic ultrasound and interventional techniques being included as part of our routine. This has therefore improved the situation for other specialities (e.g. cardiology) by increasing staff.

CONCLUSION

Diagnostic and interventional nephrologists provide complete, rapid treatment to resolve problems associated with kidney diseases. We are able to recover diagnostic and treatment techniques from other specialists. If nobody is able to imagine a cardiologist living without an ultrasound machine or a cath lab, then maybe it would not be so difficult to envisage a "new type of nephrologist", who would be a master of ultrasound, perform renal ultrasounds and vascular mapping of the upper extremity to gain vascular access, perform ultrasound-guided biopsy and provide early diagnosis for vascular access complications. Nephrologists would also be responsible for starting dialysis programmes, as it would be them who place tunnelled catheters for haemodialysis and the peritoneal catheter or perform arteriovenous fistula surgery. Furthermore, they would be capable of evaluating chronic kidney patients' cardiovascular risk, adapting treatments to these parameters throughout the disease's development.

To achieve these goals, nephrologists must complete training in experienced centres and scientific societies must create training programmes and establish the minimum accreditation requirements. In this respect, we recognise the S.E.N.'s interest in promoting this type of programme. In Spain, the national commission for this speciality should assess whether these skills should be included in the nephrologists training programme. This new approach to

nephrology may make this discipline more attractive to future resident junior doctors.

REFERENCES

1. Iversen P, Brun C. Aspiration biopsy of the kidney. Am J Med. 1951;11:324-30.
2. Quinton WE, Dillard DH, Cole JJ, Scribner BH. Eight months' experience with silastic-teflon bypass cannulas. Trans Am Soc Artif Int Organs. 1962;8:236-45.
3. Uldall PR, Dyck RF, Woods F, Merchant N, Martin GS, Cardella CJ, et al. A subclavian cannula for temporary vascular access for haemodialysis and plasmapheresis. Dial Transplant. 1979;8:963-8.
4. Brescia MJ, Cimino JE, Appel K, Hurwich BJ. Chronic hemodialysis using venipuncture and surgically created arteriovenous fistula. N Engl J Med. 1966;275:1089-92.
5. Tenckhoff H, Schechter H. A bacteriologically safe peritoneal access device. Trans Am Soc Artif Int Organs. 1968;14:181-7.
6. Ash SR. Bedside peritoneoscopic peritoneal catheter placement of Tenckhoff and newer peritoneal catheters. Adv Peritoneal Dial. 1998;14:75-9.
7. Holmes JH. Early diagnostic ultrasonography. J Ultrasound Med. 1983;2:33-43.
8. Ethier J, Mendelssohn DC, Elder SJ, Hasegawa T, Akizawa T, Akiba T, et al. Vascular access use and outcomes: an international perspective from the dialysis outcomes and practice patterns study. Nephrol Dial Transplant. 2008;23:3219-26.
9. O'Neill C. The new Nephrologist. Am J Kidney Dis. 2000;35:978-9.
10. www.asdin.org
11. http://www.isn-online.org/isn/society/about/isn_20016.html
12. http://www.asn-online.org/education_and_meetings/renal_week/archives/
13. Berns JS, O'NeilL WC. Performance of Procedures by Nephrologists and Nephrology Fellows at U.S. Nephrology Training Programs. Clin J Am Soc Nephrol. 2008;3:941-7.
14. Niyyar VD, Work J. Interventional Nephrology: Core Curriculum 2009. Am J Kidney Dis. 2009;54:169-82.
15. O'Neill WC, Ash SR, Work J, Saad TF. Guidelines for Training, Certification, and Accreditation for Hemodialysis Vascular Access and Endovascular Procedures. Semin Dial. 2003;16:173-6.
16. Teitelbaum I, Burkar J. Core Curriculum in Nephrology Peritoneal Dialysis. Am J Kidney Dis. 2003;42:1082-96.
17. Nascimento MM, Chula D, Campos R, Nascimento D, Riella MC. Interventional Nephrology in Brazil: Current and Future Status. Semin Dial 2006;19:172-5.
18. Torre León F, Rivera Bermúdez C, Hernández V, Silva J, Santiago Delpín E. Interventional Nephrology in Puerto Rico. Semi Dial. 2006;19:176-9.
19. http://www.slanh.org
20. García-Trío G, Alonso M, Saavedra J, Cigarrán S, Lamas JM. Gestión integral del acceso vascular por los nefrólogos. Resultados de tres años de trabajo. Nefrología. 2007;27:335-9.
21. Royo P, García-Testal A, Soldevila A, Panadero J, Cruz JM. Catéteres tunelizados. Complicaciones en su inserción. Nefrología. 2008;28:543-8.
22. Ibrik O, Samon R, Roca R, Viladoms J, Mora J. Catéteres tunelizados para hemodiálisis tipo «sistema Tesio de catéteres gemelos» mediante técnica ecodirigida. Análisis retrospectivo de 210 catéteres. Nefrología. 2006;26:719-25.
23. Toledo K, Pérez MJ, Espinosa M, Gómez J, López M, Redondo D, et al. Complicaciones asociadas a la biopsia renal percutánea. Experiencia en España 50 años después. Nefrología. 2010;30:539-43.
24. Lanuza M, Minguela JI, Rodado R, Muriel J, Ruiz-de-Gauna R. Our nine-year experience with the self-locating catheter: comparison of malfunction rate with other Tenckhoff catheter variants. Int J Artif Organs. 2006;26:138-41.
25. De Álvaro F, Selgas R, Bajo MA, Serrano P, Fernández-Reyes MJ, Del Peso G, et al. Moncrief's technique for peritoneal catheter placement: experience of a CAPD unit. Adv Perit Dial. 1994;10:199-202.
26. Ibeas J, Vallespín J, Rodríguez-Jornet A, Branera J, Fortuño JR, Bermúdez P, et al. Portable Doppler-ultrasound used by the nephrologist in the hemodialysis Unit for the immediate detection of fistula pathology and ultrasound guided cannulation: consolidation of a technique incide a protocolized interdisciplinary team with vascular surgeons, interventional radiologists and infirmary. A 4 years experience. J Am Soc Nephrol. 2008;19:254A.
27. Junyent M, Martínez M, Borrás M, Betriu A, Coll B, Craver L, et al. Utilidad de las técnicas de imagen y biomarcadores en la predicción del riesgo cardiovascular en pacientes con enfermedad renal crónica en España: Proyecto NEFRONA. Nefrología. 2010;30:119-26.
28. Sarnak MJ, Levey AS, Schoolwerth AC, Coresh J, Culleton B, Hamm LL, et al. Kidney disease as a risk factor for development of cardiovascular disease: a statement from the American Heart Association Councils on Kidney in Cardiovascular Disease, High Blood Pressure Research, Clinical Cardiology, and Epidemiology and Prevention. Circulation. 2003;108:2154-69.
29. Go A, Chertow GM, Fan D, McCullough CE, Hsu CY. Chronic Kidney disease and the risks of death, cardiovascular events and hospitalization. N Engl J Med. 2004;351:1296-305.
30. Weiner DE, Tighiouart H, Amin MG, Stark PC, McLeod B, Griffith JL, et al. Chronic kidney disease as a risk factor for cardiovascular disease and all-cause mortality: a pooled analysis of community-based studies. J Am Soc Nephrol. 2004;15:1307-15.
31. Fernández E, Martínez-Castelao A. Proyecto NEFRONA: banco de datos de libre utilización. Nefrología. 2011;31:5-8.
32. Rivera M, Merino JL, Puig-Hooper C, Marcen-Letosa R, Rodríguez JR, Liaño F, et al. Interventional Nephrology: A One-Center Experience for 15 Years. J Am Soc Nephrol. 2006;17:754A.
33. Rivera M. Incorporación de la ecografía a la práctica rutinaria del nefrólogo: nuestra experiencia. Nefrología. 1995;15:104-7.
34. Rivera M, Ortuño J. Ultrasonography in Nephrology. Am J Kidney Dis. 1998;32:703.
35. Rivera M, Quereda C. La ecografía realizada por el nefrólogo: nuestra experiencia. NefroPlus. 2009;2:9-16.
36. http://www.seacv.es/congresos/V_CURSO_ECO_V8.pdf
37. www.nefrosur.com/index.php?option=com_content&view=category&layout=blog&id=18&

Sent for review: 1 Feb. 2011 | Acepted: 4 Feb. 2011