

Awareness and implementation in daily practice of the *S.E.N.-semFYC consensus document on chronic kidney disease*

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ABSTRACT

Background: In 2007, the Spanish Society of Family and Community Medicine (semFYC) and the Spanish Society of Nephrology (S.E.N.) created a consensus document in order to reduce the variability in clinical practices for the detection, treatment, and referral of cases of chronic kidney disease (CKD). **Objectives:** To evaluate the level of awareness, dissemination, agreement, and application of the S.E.N.-semFYC consensus document on chronic kidney disease. **Method:** Ours was a cross-sectional, descriptive, and observational study carried out among 476 primary health care doctors and nephrologists using a survey. **Results:** Of the 326 primary care doctors and 150 nephrologists surveyed, 51.1% and 89.6% respectively knew of the consensus document. A total of 70.8% of nephrologists considered the document to be highly necessary, and were very much in agreement with the content. Primary care doctors placed more value on the practical usefulness of the document (63.2% AP vs. 52.1% nephrologists). The sections that reported the greatest level of unfamiliarity among primary care doctors (>20% of those surveyed) included recommendations regarding the suitability of ultrasound examinations in male patients with CKD older than 60 years of age and in regards to the criteria for patient referral to the nephrology department. The level of application of the recommendations set forth in the document varied widely

between the two specialties, with greater compliance among nephrologists. Age, sex, field of medicine, professional experience, the population treated, and health care workload were not significantly associated with differences in awareness, perceived need, or application of the consensus document. **Conclusions:** This survey demonstrates that the level of implementation of the S.E.N.-semFYC consensus document for CKD has much room for improvement, above all among primary care physicians. The application of this consensus document can improve clinical practice. Several critical aspects have been identified in the evaluation and referral of patients with CKD that must be addressed through the establishment of strategies for disseminating information and continued training for the scientific societies involved in treating these patients.

Keywords: Primary health care. Nephrology. S.E.N.-semFYC Consensus Document. Chronic kidney disease. Prevention. Clinical guidelines. Early detection. Follow-up.

Conocimiento y aplicación en la práctica real del Documento de consenso S.E.N.-semFYC sobre la enfermedad renal crónica

RESUMEN

Antecedentes: En el año 2007 la Sociedad Española de Medicina Familiar y Comunitaria (semFYC) y la Sociedad Española de Nefrología (S.E.N.) realizaron un documento de consenso para disminuir la variabilidad en la práctica clínica

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ca en la detección, tratamiento y derivación de la enfermedad renal crónica (ERC). **Objetivos:** Evaluar a los dos años de su publicación el conocimiento, difusión, grado de acuerdo y aplicación del Documento de consenso S.E.N.-semFYC sobre la enfermedad renal crónica. **Métodos:** Estudio transversal, descriptivo y observacional realizado en 476 médicos, incluyendo médicos de Atención Primaria (AP) y nefrólogos, mediante encuesta de opinión. **Resultados:** De los 326 médicos de AP y 150 nefrólogos encuestados, 51,1 % y 89,6 % respectivamente conocían el Documento de consenso. El 70,8 % de los nefrólogos lo considera muy necesario, con alto grado de acuerdo con sus contenidos. Los médicos de AP valoran más su utilidad práctica (63,2 % AP vs. 52,1 % nefrólogos). El mayor grado de desconocimiento en AP (> 20 % de los encuestados) incluye recomendaciones sobre la idoneidad del estudio ecográfico en varones con ERC mayores de 60 años y sobre los criterios de derivación a Nefrología. El grado de aplicación de las recomendaciones entre ambos especialistas resulta muy variable, siendo superior en nefrólogos. Edad, sexo, ámbito de trabajo, experiencia profesional, hábitat poblacional y presión asistencial no se asociaron con diferencias en el conocimiento, percepción de necesidad y aplicación del consenso. **Conclusiones:** Esta encuesta constata que el grado de difusión del documento S.E.N.-semFYC sobre ERC es mejorable, sobre todo en AP. Su aplicación puede modificar la práctica clínica. Se han identificado varios aspectos críticos en la evaluación y la derivación de los pacientes con ERC sobre los que deberían establecerse estrategias de difusión y formación continuada por las sociedades científicas implicadas.

Palabras clave: Atención Primaria. Nefrología. Guía de consenso S.E.N.-semFYC. Enfermedad renal crónica. Prevención. Guías clínicas. Detección precoz. Seguimiento.

INTRODUCTION

Chronic kidney disease (CKD), defined as a decrease in renal function (glomerular filtration rate [GFR] or creatinine clearance rate $<60\text{ml}/\text{min}/173\text{m}^2$) or as persistent renal damage lasting at least three months,^{1,2} constitutes an important health problem in industrialised nations. CKD is associated with an aging population, arterial hypertension (AHT), and diabetes mellitus (DM).³ The prevalence of this disease increases with age. According to the results of the EPIRCE study, the prevalence of CKD in Spain is 9.16%, a number that increases to 23.7% in individuals older than 64 years of age.⁴ CKD also makes individuals 3–10 times more at risk for cardiovascular events as compared to reference populations,^{5,6} and is associated with increased mortality and hospitalisation rates.^{7,8} Early stages of CKD tend to be asymptomatic and easily detectable in the primary care (PC)

setting during routine check-ups in older patients, those with hypertension, and those with diabetes, by determining plasma creatinine levels, GFR as estimated using standard formulas,^{2,3} and by calculating urine albumin/creatinine ratios in a simple urine sample. However, these tests are not always applied, such that a large portion of patients have hidden CKD; that is to say, reduced GFR but with plasma creatinine values that fall within the normal range in laboratory tests.³ The importance of early detection of CKD is based on the fact that early actions to combat factors that favour the progression of kidney disease (such as proteinuria, AHT, and DM), cessation of potentially nephrotoxic medications, and optimising drug doses for GFR may slow the progression of renal failure and its associated complications.²

Given the high prevalence of CKD, its economic repercussions (in Spain, the cost of treating this disease in its advanced stages is estimated at 800 million Euros/year),² the associated risk for cardiovascular disease, and the availability of medications that are effective at impeding or slowing its progression,⁹ clinical guidelines have been developed for the diagnosis and proper follow-up of cases of CKD directed towards both PC doctors and nephrologists (K/DOQI¹, KDIGO,¹⁰ S.E.N.,¹¹ CMJA,¹² NICE,¹³ SIGN,¹⁴ Renal Association,¹⁵ among others). Experts and health authorities such as the World Health Organisation (WHO) have alerted the medical community as to the need for effectively disseminating the information in these documents in order to facilitate appropriate medical practices. However, the level of awareness and implementation of these evidence-based clinical recommendations is insufficient.

In 2007, the Spanish Society of Family and Community Medicine (semFYC) and the Spanish Society of Nephrology (S.E.N.) created a consensus document with the goal of decreasing the variability in clinical practices for the detection, treatment, and referral of patients with CKD, and to promote health care collaboration and coordination between PC and nephrology.² This *S.E.N.-semFYC consensus document on chronic kidney disease* included 13 recommendations based on scientific evidence covering the following topics: 1) optimisation of treatment; 2) urinary pathology; 3) patient screening; 4) evaluation of renal function; 5) estimating GFR using equations; 6) estimating GFR using other methods; 7) evaluating urinary excretion of proteins; 8) vascular risk (detection and management) 9) controlling vascular risk factors; 10) prevention of iatrogenic events; 11) referral to nephrology; 12) referral of diabetic patients to nephrology; and 13) PC-nephrology collaboration.

The objective of this study was to evaluate the level of acceptance, awareness, agreement, and implementation of these guidelines among Spanish nephrologists and PC physicians two years after publication.

MATERIAL AND METHOD

Ours was an observational, descriptive, and cross-sectional study carried out through the application of a self-administered, voluntary, written survey between May and November 2009. The questionnaire was composed of 24 items regarding the recommendations made in the S.E.N.-semFYC consensus document, grouped into four sections: the concept of CKD, detection and diagnosis of CKD, therapeutic approach, and referral to nephrology. Each of the items comprised two multiple choice questions with answers referring to the appropriateness and use of the S.E.N.-semFYC recommendations evaluated in each item (Appendix I).

The questionnaires were distributed along with a letter of invitation to both medical societies (nephrology and primary care) by mail, with a second dispatch if necessary, to 550 family doctors and 200 nephrologists, of which 326 PC physicians and 150 specialists responded. The total number of doctors participating in the survey was then stratified into sub-samples corresponding to the proportion of the population treated in each autonomous community. The sample of randomly selected participants was large and geographically diverse, yielding a high estimated precision for the responses to the survey items, with a maximum error of $\pm 5\%$ for PC and $\pm 8\%$ for nephrology, with a 95% confidence level.

The eligibility criteria for participation in the study were: practicing nephrologists and PC physicians of any sex or age, working at public and private Spanish health care institutions anywhere within the country, and who frequently treat patients with AHT, diabetes, and/or CKD.

Variables and measurements

The initial block of questions in the survey referred to the profile of each participant (demographic data, professional experience, field of medicine, type of patients treated, workload, etc.). The second block of questions was a questionnaire designed to evaluate the participant's level of awareness, agreement, and implementation in daily practice of the clinical recommendations regarding CKD contained within the *S.E.N.-semFYC consensus document on chronic kidney disease* (Table 1). The questionnaire ended with questions concerning the opinion of each participant regarding the usefulness and need for this document.

Members of each professional society also responded to a group of questions considered by the scientific committee of the study to be of particular interest for each speciality: PC (items 1-11 and 13-18) and nephrology (items 4-5, 8-12, and 15-24). Some of these items were designed exclusively for only one speciality (PC: 1-3, 6-7, 13, and 14; nephrology: 12

and 19-24), whereas others were responded to by members of both specialities.

For each clinical recommendation evaluated, different aspects were assessed based on the speciality of the survey participant. PC physicians were asked for their personal evaluation regarding prior awareness of the recommendation and the level of implementation in their daily practice. Nephrologists were asked to give a professional evaluation of the recommendation and to state their level of implementation of each recommendation based on personal criteria.

Once completed, the paper questionnaires were scanned by trained personnel using mrScan[®] software, an application that facilitates automatic preparation of printed questionnaires for scanning and digitalising the results. This obviated the need for double manual entry of information.

Preparation, analysis, and interpretation of the results

The survey results were tabulated in terms of relative frequency distributions (%) for each response option for each item and for each medical speciality (PC and nephrology).

We analysed the significance of differences between PC physicians and nephrologists in self-reported awareness regarding each recommendation using chi-square tests.

In order to identify possible differences in the global level of agreement expressed by survey participants on an ordinal scale, we obtained mean and median values for the score reported for each item (categorising these responses on an ordinal scale of 1 to 5), and constructed a 95% confidence interval around the mean. We analysed the significance of differences in the criteria/opinion expressed by members of each speciality using Mann-Whitney non-parametric U-tests.

We also used standard statistical tests (chi-square, Student's t, analysis of variance, or their non-parametric equivalents) to analyse possible associations between personal and professional characteristics of the survey participants (medical speciality, age, field of medicine, professional experience, etc.) and certain characteristics of the test.

Ethical/legal aspects

Our study was a survey of professional attitudes and opinions that did not affect routine clinical practice or produce any type of intervention on patients. The study also did not compile any information regarding patient identities or their pathologies. The data compiled regarding

Tabla 1. Content of the context recommendations evaluated in our study

Item	Section 1: Concept of CKD
1	CKD is considered to be a decrease in renal function (glomerular filtration rate-GFR<60ml/min/1.73m ²) with persistence for at least three months.
2	Renal damage is diagnosed using direct methods (renal biopsy) or indirect markers such as albuminuria or proteinuria, altered urinary sediments, or imaging tests, with persistence for at least three months
3	CKD is categorised based on GFR using the following scale:

Stage	GFR (ml/min/1,73 m ²)	Description
1	≥ 90	Renal damage with normal FGR
2	60-89	Renal damage with normal FGR
3	30-59	Moderate decrease in GFR
4	15-29	Severe decrease in GFR
5	< 15 o diálisis	Predialysis/dialysis

Stages 3-5 are commonly referred to as "renal failure". Symptoms must persist for at least 3 months.

Item	Section 2: Detection and Diagnosis of CKD
4	All patients with CKD -renal failure (GFR<60ml/min) and/or renal damage- must be monitored to evaluate the evolution of disease stages, potential reversibility of disease, and prognosis in order to optimise treatment options.
5	In all male patients older than 60 years of age with CKD, an ultrasound must be used to rule out the presence of obstructive urinary pathology.
6	Groups of patients at risk for developing CKD and who should go through a screening process include: older than 60 years of age, hypertensive, diabetic, cardiovascular disease, and those with family members with renal failure.
7	Screening for CKD consists of evaluating GFR and albuminuria at least once per year in at-risk patients.
8	Renal function should not be assessed solely based on evaluations of serum creatinine levels. GFR should be estimated using a standardised formula, preferably the MDRD equation (Modification of Diet in Renal Disease). Alternatively, the Cockcroft-Gault formula can be used.
9	Creatinine clearance measured in 24-hour urine samples does not generally improve the accuracy of GFR estimates derived from equations.
10	When predictive equations are used, a numerical value for GFR should only be reported if this value is <60ml/min, not when the value is greater than this cut-off.
11	Urinary protein excretion should be evaluated preferably using albumin/creatinine ratios in single urine samples (normal <30mg/g), preferably in the first morning urine.
12	Albumin/creatinine ratios provide a good estimate of proteinuria and obviate the need for taking 24-hour urine samples.

Item	Section 3: Treatment Approach in Patients With CKD
(13)	In the general treatment of patients with CKD, special emphasis should be placed on controlling typical vascular risk factors. The treatment objectives are:
13a	Control of BP<130/80mm Hg (125/75mm Hg if the albumin/creatinine ratio is >500mg/g).
13b	Reduction of proteinuria (with the objective of reaching an albumin/creatinine ratio <300mg/g) with ACE inhibitors or ARBs.
13c	Control of dyslipidaemia: c-LDL<100mg/dl and c-HDL>40mg/dl.
13d	Control of diabetes: HbA1c<7%.
(14)	In the general approach for patients with stage 3-5 CKD (renal failure), special attention must also be placed on avoiding iatrogenic event:
14a	Adjustment of medications based on GFR, especially in the elderly.
14b	Avoiding whenever possible the use of NSAIDs.
14c	Precautions when using metformin and oral anti-diabetics that are eliminated through the kidneys (the majority), and avoiding their use altogether when GFR<30ml/min.
14d	Avoiding uncontrolled combinations of drugs that produce potassium retention: ACE inhibitors, ARBs, potassium-sparing diuretics, NSAIDs, and beta-blockers.

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Continued table 1. Content of the context recommendations evaluated in our study

Item	Section 4: Referral of Patients With CKD to Nephrology			
15	Patients >70 years of age with stable stage 1-3 CKD (GFR>30ml/min) and albuminuria <500mg/g can be treated in primary care with no need for referral to nephrology, as long as BP and other vascular risk factors are properly controlled.			
(16)	Referral of patients <70 years of age:			
16a	Patients < 70 years of age with GFR>45ml/min should be referred to nephrology if albumin is increasing or >500mg/g, or in the presence of complications (anaemia: Hb<11g/dl after correcting ferropeonia, or inability to control vascular risk factors such as AHT refractory to treatment). These patients should be monitored through primary care or by joint collaboration as necessary.			
16b	Patients <70 years of age with GFR<45ml/min should be referred to nephrology. Joint follow-up with primary care may be appropriate in certain circumstances.			
17	All patients with stage 4-5 CKD must be referred to nephrology.			
18	In addition to the aforementioned criteria, diabetic patients should be referred to nephrology if albuminuria is present: albumin/creatinine ratio (confirmed) >300mg/g, despite providing appropriate treatment and BP control.			
19	In addition to the aforementioned criteria, diabetic patients should be referred to nephrology if albuminuria increases despite providing appropriate treatment			
20	In addition to the aforementioned criteria, diabetic patients should be referred to nephrology in the event of AHT refractory to treatment (using three different drugs at maximum doses with no effect).			
21	With the objective of providing a protocol for joint patient follow-up between primary care and nephrology, the following algorithm is proposed:			
	MDRD-estimated GFR (ml/min)			
	> 60 (CKD 1-2)	45-60 (CKD 3)	30-45 (CKD 3)	< 30 (CKD 4-5)
Primary care	6 Months	4-6 Months	3-6 Months	Individualised
Nephrology	1 year or no follow-up	1 year or no follow-up	6 Months	1-3 Months
22	Upon each follow-up session of CKD patients in primary care, anaemia should be monitored. If CKD stage 3-5 and Hb<11g/dl, referral should be considered for a nephrology consultation in order to evaluate treatment with erythropoietin-stimulating agents.			
(23)	Upon each follow-up session of CKD patients in primary care, diet habits should be reviewed, with recommendations given regarding what type of diet should be followed based on GFR values, as follows:			
23a	CKD 1-3: low-sodium diet in the case of AHT.			
23b	CKD 4-5: diet limitations for sodium, phosphorous, and potassium.			
24	Upon each follow-up session of patients with CKD stage 3 or higher in primary care, the following should be measured: haemogram, blood biochemistry (glucose, serum creatinine, urea, Na, K, Ca, P, albumin, and cholesterol), MDRD-estimated GFR, urine biochemistry (single urine sample from first morning urine), albumin/creatinine ratio, urinary sediments, and monitoring of any prior alterations (analyses of 24-hour			

NSAID: non-steroidal anti-inflammatory drugs; ARB: angiotensin receptor blocker; c-HDL: high-density lipoprotein-linked cholesterol; c-LDL: low-density lipoprotein-linked cholesterol; CKD: chronic kidney disease; GFR: glomerular filtration rate; AHT: arterial hypertension; ACE inhibitor: angiotensin-converting enzyme inhibitor; BP: blood pressure.

professional attitudes and opinions were processed anonymously, and results were not linked in any way to the identity of study participants. Data regarding researchers were treated based on organic law 15/1999, from 13 December, for the protection of personal information.

RESULTS

Professional environment and participant profiles

We surveyed a total of 476 doctors from all Spanish autonomous communities. The profiles of the study participants are summarised in Table 2. Compared to nephrologists, PC physicians had a longer history of medical

practice and attended to more patients/week with cardiovascular risk, defined as patients >60 years of age, with AHT, or with DM. Nephrologists, on the other hand, tended to treat patients in urban areas and treated more patients with CKD than PC physicians.

Nephrologists had a greater level of access to GFR estimates using the MDRD formula (*Modification of Diet in Renal Disease, MDRD-GFR*) in their normal laboratory analyses (86.8% vs 66.6% in PC physicians; $P<.001$). There were no differences in terms of creatinine clearance estimates using the Cockcroft-Gault formula (72.1% in PC physicians vs 64.6% in nephrologists) or albumin/creatinine ratios (Alb/Cr) in urine samples (94.4% in nephrologists vs 94.1% in PC physicians).

Table 2. Profiles of the doctors surveyed

Speciality	Primary Care	Nephrology	P
n (%)	326 (68.3)	150 (31.7)	
Years of practice	21.6	18.6	0.004
Public health care (%)	86.1	91	
Works in urban environment (>25 000 inhabitants) (%)	63.3	92.5	< 0.001
Patients with cardiovascular risk ^a /week (n)	45.2	36.5	< 0.001
Patients with CKD/week (n)	8.2	39.5	< 0.001

n=476. CKD: chronic kidney disease.

^aPatients <60 years/arterial hypertension/diabetes mellitus

None of the following descriptive variables of the professional profiles of the study participants (age, sex, public or private practice, professional experience, geographical area, number of patients with CKD or risk factors treated, or access to diagnostic tests of renal function in laboratory analyses) were associated with the level of awareness or perceived need/usefulness of the consensus document.

Level of awareness of the S.E.N.-semFYC consensus document on chronic kidney disease in primary care

Only 51.1% of PC physicians reported familiarity with the contents of the S.E.N.-semFYC consensus document before participation in the survey.

The level of awareness among PC physicians of each of the 24 items in the questionnaire regarding the consensus document (Table 1) that were selected specifically for PC physicians (1-11, 13-18) varied widely: between 0.9% and 50% of PC physicians surveyed reported that they had no previous familiarity with these characteristics. In 5 of the 24 items (5, 9, 10, 15, and 16a), the percentage of prior unfamiliarity surpassed 20% of survey participants (Table 3), this constituting poor awareness of the recommendation. A level of unfamiliarity of 10%-20% was considered to be normal, and 0%-10% was considered to be indicative of good awareness. These five items of “poor awareness” among PC physicians are particularly relevant, since these include the criteria for the appropriateness of urinary ultrasound analyses in males older than 60 years of age with CKD, and the criteria for referring patients to nephrology.

Level of agreement with the S.E.N.-semFYC consensus document on chronic kidney disease among nephrologists

The level of professional agreement (consideration of the document as appropriate) with each of the recommendations

made as manifested by the nephrologists surveyed reached a high level in all cases (total or partial agreement) (Figure 1).

The mean percentage of nephrologists in complete agreement with the specific recommendations for their speciality (“total agreement”) was 64.1% (range: 34.7%-83.1%), and the level of partial agreement (“tends to agree”) was 29.7% (range: 16.9%-52%).

The recommendation that yielded the greatest level of agreement was item 20: “In addition to the aforementioned criteria, diabetic patients should be referred to nephrology

Table 3. Level of awareness of the consensus recommendations as reported by primary care physicians surveyed

Item ^a from the study questionnaire	PC physicians who are not familiar with the item (%)
1	11.3
2	11.8
3	19.9
4	5.9
5	23.0
6	6.5
7	8.7
8	16.1
9	28.6
10	50.2
11	5.5
13a	7.1
14a	1.9
14b	2.2
14c	9.8
14d	5.2
15	21.1
16a	20.9
16b	11.9
17	3.1
18	16.1

PC: primary care.

^aItem: each of the survey questions used in the study.

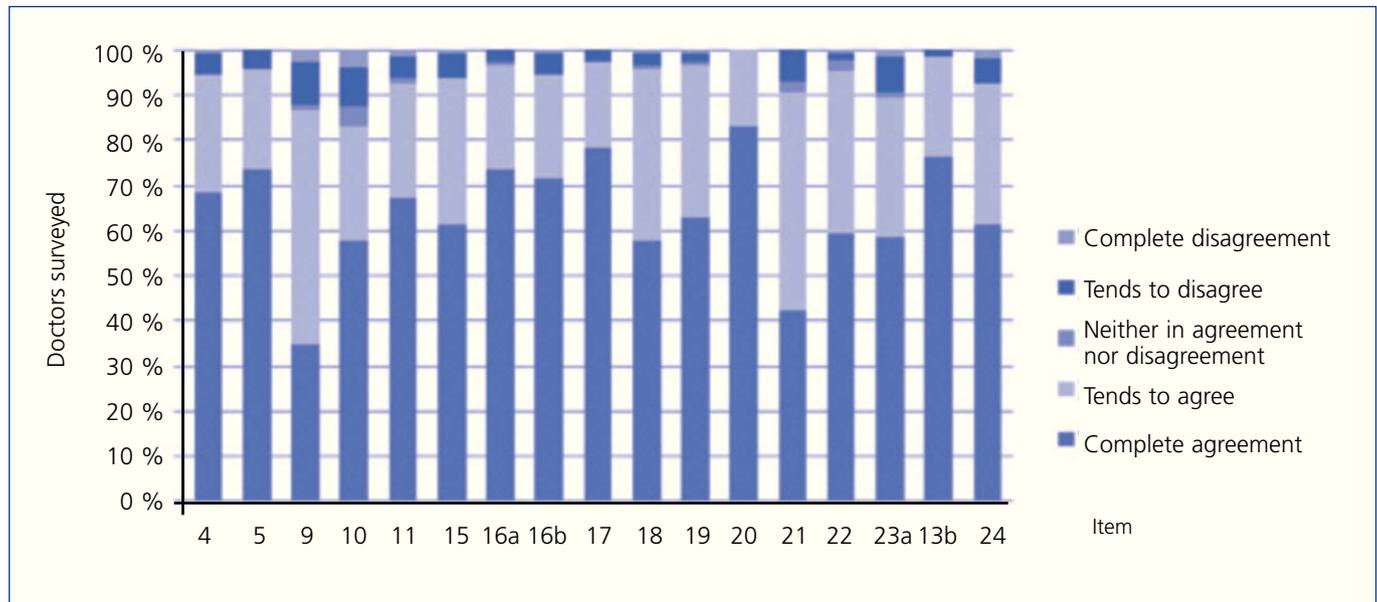


Figure 1. Level of agreement with the S.E.N.-semFYC guidelines, nephrologists.

when also suffering from AHT refractory to treatment (three different drugs at maximum doses and still no control)”, with an 83.1% rate of total agreement among nephrologists surveyed.

We also observed a strong correlation between the level of professional agreement reported for each recommendation and the level of implementation of said recommendation in routine clinical practice (Spearman’s coefficient >0.4).

Level of implementation of the S.E.N.-semFYC consensus document on chronic kidney disease in nephrologists and primary care physicians

The level of implementation in routine clinical practice reported for the recommendations in the consensus document that were specific for nephrologists was very high; in all cases (Figure 2), the mean score was situated between “always” (51.2%) and “almost always” (38%). Only 0.7% and 8.1% of nephrologists answered “never” or “rarely”, respectively. The recommendation corresponding to item 12: “Albumin/creatinine ratio provides a good estimate of proteinuria and obviates the need for taking 24-hour urine samples” was the least closely followed recommendation of all, with 8.1% of survey participants reporting “never” or “rarely”.

Upon comparing the level of implementation of recommendations between PC physicians and nephrologists, only 2 items (11 and 15, regarding the evaluation of urinary protein excretion and referral to nephrology, respectively) were equally followed by nephrologists and PC physicians. For all other items, nephrologists reported a greater level of

implementation than PC physicians; “always”: nephrologists: 51.2% (range: 27.4%-74.8%) vs. PC physicians: 35.8% (range: 22.7%-72.3%); “almost always”: nephrologists: 38% (range: 22.4%-49.3%) vs PC physicians: 42.6% (range: 23.9%-54.4%). This difference was especially notable for three items (Table 4): item 5, regarding obstructive pathologies in male patients >60 years of age (93.6% vs 60.4%); item 9, regarding creatinine clearance measurements in 24-hour urine samples for estimating GFR (80.4% vs 64.5%), and item 10, regarding the numerical results of GFR (85% vs 44.1%).

Perception of the need and usefulness of the S.E.N.-semFYC consensus document on chronic kidney disease

As a group, nephrologists manifested a greater perceived need for the S.E.N.-semFYC consensus document on chronic kidney disease in order to improve the quality of clinical practice. However, the usefulness of the document for clinical practice was given greater value among PC physicians than among nephrologists ($P<.001$) (Figure 3).

DISCUSSION

The results from our study provide useful information regarding the profiles of doctors who treat CKD patients, their level of familiarity with this pathology, and their opinions regarding the recommendations and level of application of the S.E.N.-semFYC consensus document on chronic kidney disease.

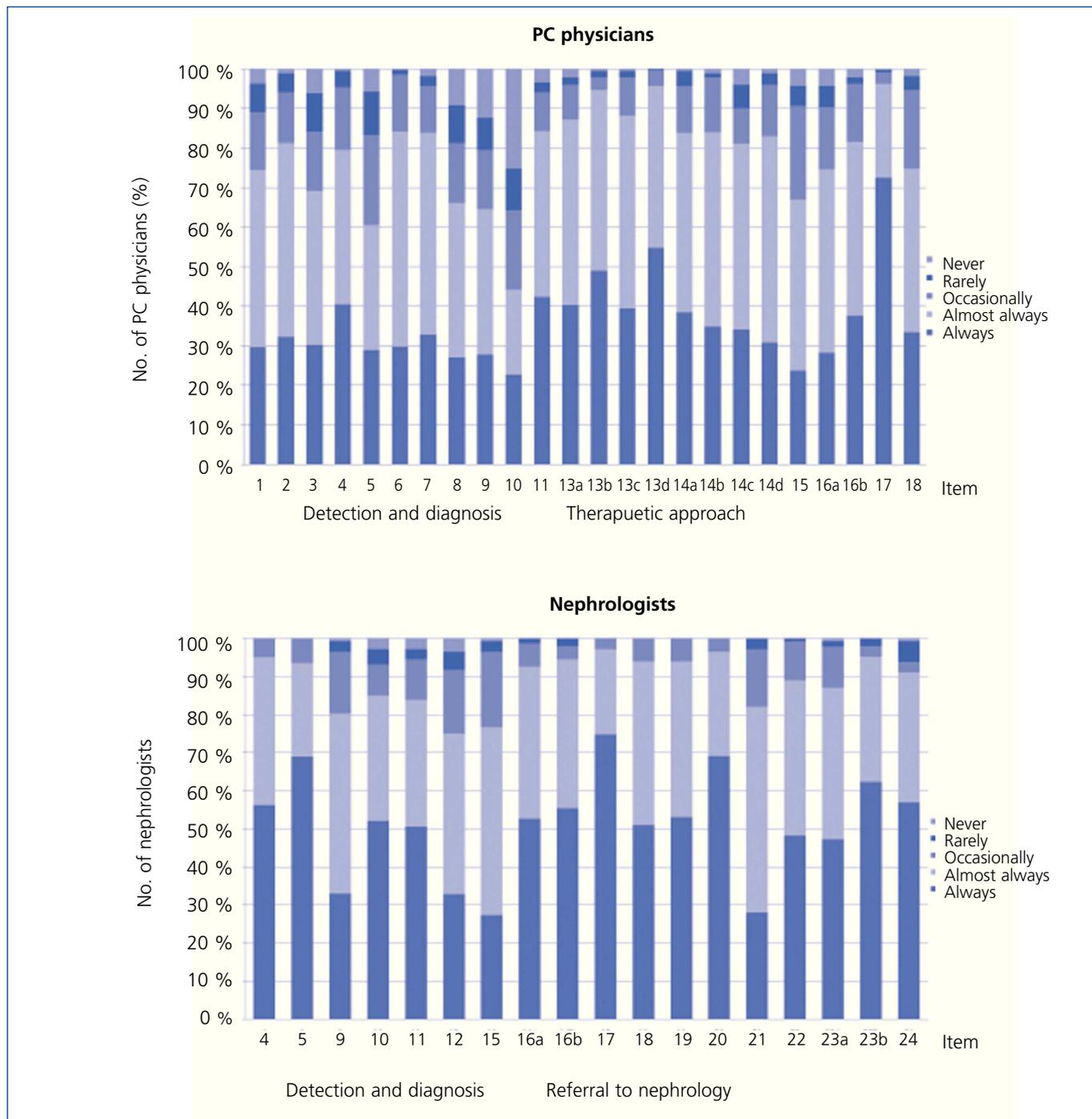


Figure 2. Level of implementation of the S.E.N.-semFYC consensus guidelines among nephrologists and primary care physicians.

PC: primary care.

CKD has a high prevalence in the general population, which places the PC physician at an ideal position for identifying the at-risk population and providing early detection and treatment of this disease.¹⁶ Referral of patients to nephrology should be limited to select cases, primarily those with the greatest risk for progression or already in advanced stages of CKD. In fact, some programmes for shared treatment of CKD between PC and

nephrology reveal that a substantial number of renal patients do not require referral.¹⁷

One of the most notable results from our survey is that, despite a major effort for dissemination throughout all implicated scientific societies, only half of the PC physicians that responded to the questionnaire were familiar with the *S.E.N.-semFYC consensus document on chronic kidney*

Table 4. Difference in the level of implementation of consensus recommendations reported by physicians of both specialties

Significance of differences in level of implementation between primary care and nephrology

S.E.N.-semFYC ^a	Item ^b	P ^c
Detection and diagnosis of CKD		
1	All patients with CKD -renal failure (GFR<60ml/min) and/or renal damage- must be monitored to determine evolution of disease, potential reversibility, and prognosis in order to optimise treatment options	0,0001
2	All males older than 60 years of age with CKD must be administered an ultrasound in order to rule out the possibility of obstructive urinary pathology	< 0,0001
4	Creatinine clearance values obtained using 24-hour urine samples do not generally improve the accuracy of GFR estimates as obtained using equations	0,001
5	When using predictive equations, a numerical value for GFR should only be provided when <60ml/min, not when values are higher than this cut-off	< 0,0001
7	Urinary protein excretion should preferably be evaluated using albumin/creatinine ratios taken from single urine samples (normal <30mg/g), preferably from the first morning urine	0,13
Referral to nephrology		
11	Patients > 70 years of age, with stable stage 1-3 CKD (GFR>30ml/min) and albuminuria <500mg/g can be treated in the context of primary care and do not need to be referred, as long as BP and other vascular risk factors are well controlled	0.04
	Patients < 70 years of age with GFR>45ml/min must be referred to nephrology if albuminuria is increasing or >500mg/g, or in the case of complications (anaemia: Hb<11g/dl after correction of ferropoenia, or inability to control vascular risk factors such as AHT refractory to treatment	< 0.0001
	Patients <70 years of age with GFR<45ml/min should be referred to nephrology. Follow-up in primary care or by joint collaboration may be appropriate in select cases.	< 0.0001
	Patients with stage 4-5 CKD must be referred to nephrology in all cases.	0.58
12	In addition to the aforementioned criteria, diabetic patients should be referred to nephrology in the case of albuminuria: albumin/creatinine ratio (confirmed) >300mg/g, despite adequate treatment and controlled BP.	< 0.0001

PC: primary care; CKD: chronic kidney disease; GFR: glomerular filtration rate; AHT: arterial hypertension; BP: blood pressure.

^a Recommendations from the S.E.N.-semFYC guidelines. Recommendations may be listed as an item in the questionnaire or be sub-divided into multiple items. ^b Item: each of the survey questions used in the study. ^c Statistical significance reported by the Mann-Whitney U-test.

disease. These results are similar to those published regarding awareness of CKD clinical practice guidelines from other countries.¹⁸⁻²⁰

We also observed that PC physicians are not very familiar with the recommendations regarding patient referral to nephrology, and these are the items that are least applied in clinical practice. Two of every three PC physicians

surveyed reported that they always or almost always apply recommendation 15 (no need for referring patients >70 years of age with stable CKD in stage 1-3 and albuminuria <500mg/g). Taking into account the large number of CKD patients that fall under these criteria (in the EPIRCE study,⁴ 52% of all patients with CKD were older than 65 years of age with stage 1-3 CKD), lack of awareness and implementation of this recommendation

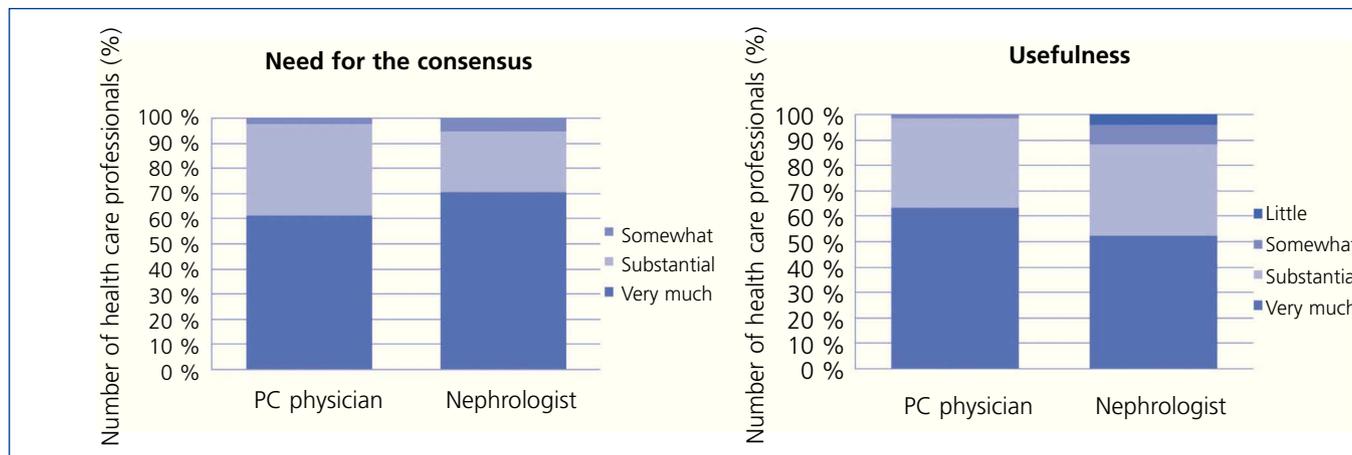


Figure 3. Need for the consensus document and usefulness for improving clinical practices for treating chronic kidney disease.

PC: primary care.

among PC physicians is an important point for improvement.

The results of our survey reflect a very positive opinion among nephrologists regarding these guidelines, with 70.8% of those surveyed reporting that they considered the guidelines to be useful and at least moderately influential in daily clinical practice (52.1%). These results are similar to those from surveys carried out in other countries,^{21,22} and reflect the potential capacity of evidence-based documents for modifying the clinical decision making process.²²

The survey demonstrated that 30% of PC physicians and 20% of nephrologists do not normally use the CKD stage classification system provided in the consensus document (the same as proposed by the KDIGO and National Kidney Foundation guidelines). This may be due to the fact that insufficient time has passed since the publication of the consensus document and guidelines for CKD in order to completely modify the clinical practice of the health care professionals surveyed. This is compounded by the variability in the definitions used for CKD in original publications from the medical literature. In a recent review, the internationally accepted definition of CKD was specifically mentioned and clearly adopted in only 20% of all articles on CKD published in 2009.²³

As regards the laboratory analyses used to evaluate renal function, the Spanish Society of Clinical Biochemistry and Molecular Pathology, together with the S.E.N., established recommendations in 2007²⁴ specifying that glomerular filtration rates “must be estimated using equations based on serum creatinine levels, thus obviating the need for measuring creatinine clearance in 24-hour urine samples” in clinical practice. However, our survey showed that almost 30% of PC physicians did not recognise that “creatinine

clearance as measured in 24-hour urine samples does not generally improve the accuracy of GFR values as obtained using equations”, which highlights the need for implementing strategies for disseminating these recommendations among Spanish doctors.

At the time of the survey, the normally used equations for estimating glomerular filtration rate (Cockcroft-Gault and MDRD) were well-known and routinely used by PC physicians (practically 85% were familiar with the equations and more than 75% were in complete agreement with their use). The most recent equation, the CKD-EPI, was not well established at the time of the survey, and so it was not included in the questionnaire.

We observed a high level of professional agreement among nephrologists with the recommendations outlined in the consensus document, as was the case for the level of implementation of these recommendations, except for the item regarding urinary albumin excretion: “albumin/creatinine ratios provide a good estimate of proteinuria and obviate the need for taking 24-hour urine samples”, in which the level of implementation was lower. Three different tests are commonly used in the medical literature for measuring proteinuria: dipstick, protein/creatinine ratio in urine samples, and 24-hour urine samples,²⁵ although current guidelines preferably recommend the use of the albumin/creatinine ratio.²⁶ The reference intervals for Alb/Cr do not take into account differences in creatinine excretion between different populations of patients (related to differences in sex, age, and ethnicity) or the increase in risk related to albumin excretion,²⁷ which could explain why this is the least commonly applied of all recommendations from the *S.E.N.-semFYC consensus document on chronic kidney disease* by nephrologists (8.1% reported that they “never” or “almost never” followed this recommendation).

The level of implementation appears to be correlated with prior familiarity as reported by the survey participants. Although PC physicians declared a substantial level of implementation of the consensus document recommendations, this was significantly lower than the high level of implementation reported by nephrologists. This could be due to the fact that, compared with nephrologists, PC physicians use much more heterogeneous criteria for evaluating patients with CKD.²⁸

This is the first cross-sectional study to evaluate the opinions of both PC physicians and nephrologists regarding guidelines and recommendations that are widely distributed among practitioners of both specialties. Our results show that the implementation of clinical practice guidelines, in this case regarding CKD, is not a simple process due to the presence of barriers for development and application. We have shown that the *S.E.N.-semFYC consensus document* would have the potential to modify the clinical practice of health care professionals if the dissemination of these recommendations among PC physicians were greater. The information provided by our study could provide a strong baseline upon which to develop future training measures for the health care professionals involved in the global process of treating patients with CKD (both nursing staff and medical residents), primarily in the form of prevention. Our study has also pointed out the need for improving the awareness and use of this document among PC physicians, with special emphasis on the criteria for referring patients to nephrology.

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Conflicts of interest

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