

Special article

Position statement of the Spanish Society of Nephrology on the SARS-CoV-2 vaccines[☆]

Emilio Sánchez-Álvarez^{a,d}, Borja Quiroga^{b,d,*}, Patricia de Sequera^{c,d}, en representación de la Junta Directiva de Sociedad Española de Nefrología¹

^a Servicio de Nefrología, Hospital Universitario de Cabueñes, Gijón, Spain

^b Servicio de Nefrología, Hospital Universitario de La Princesa, Madrid, Spain

^c Servicio de Nefrología, Hospital Universitario Infanta Leonor, Madrid, Spain

^d Junta Directiva de la Sociedad Española de Nefrología, Spain

ARTICLE INFO

Article history:

Received 21 December 2020

Accepted 22 December 2020

Available online 22 September 2021

Keywords:

COVID-19

Chronic kidney disease

Dialysis

SARS-CoV-2

Transplant

Vaccine

ABSTRACT

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread worldwide over the last year causing more than one million deaths. Several treatments have tried to modify the natural history of the coronavirus disease 2019 (COVID-19) but only corticosteroids have demonstrated to be effective in moderate or severe affectation. In that situation, the development of vaccines for preventing the SARS-CoV-2 infection has focused the attention of the scientific community. At present, available messenger RNA-based technology vaccines have received the approval of local and international sanitary authorities. In this position statement, the Spanish Society of Nephrology wants to state that patients with chronic kidney disease and healthcare workers are at high-risk for contagion and complications of COVID-19 so they must have priority in the vaccine administration.

© 2020 Sociedad Española de Nefrología. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

DOI of original article:

<https://doi.org/10.1016/j.nefro.2020.12.002>.

^{*} Please cite this article as: Sánchez-Álvarez E, Quiroga B, de Sequera P. Posicionamiento de la Sociedad Española de Nefrología ante a la vacunación frente al SARS-CoV-2. Nefrología. 2021;41:412–416.

^{*} Corresponding author.

E-mail address: borjaqq@gmail.com (B. Quiroga).

¹ More information on the Board of Directors of the Spanish Society of Nephrology is provided in the Appendix A.

2013-2514/© 2020 Sociedad Española de Nefrología. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Posicionamiento de la Sociedad Española de Nefrología ante a la vacunación frente al SARS-CoV-2

R E S U M E N

Palabras clave:

COVID-19
Enfermedad renal crónica
Diálisis
SARS-CoV-2
Trasplante
Vacuna

La expansión de la pandemia por el coronavirus de tipo 2 causante del síndrome respiratorio agudo severo (SARS-CoV-2) ha ocasionado más de un millón de muertos en todo el planeta. Un año después de su irrupción, numerosos tratamientos se han postulado sin llegar a alcanzarse resultados clínicamente significativos, a excepción de los corticoides en pacientes con afectación moderada-severa de la enfermedad por coronavirus 19 (COVID-19). En este escenario, la prevención mediante vacunas ha centrado la atención de la comunidad científica. En el momento actual, disponemos de las primeras aprobaciones para el uso de vacunas basadas en ARN mensajero y las agencias locales e internacionales se disponen de manera inminente a su aprobación. Dado que la infección por COVID-19 es frecuente en los pacientes con enfermedad renal terminal y condiciona una elevada mortalidad, desde la Sociedad Española de Nefrología consideramos que los pacientes con enfermedad renal y los profesionales que los atienden deben considerarse prioritarios para recibir la vacuna por su elevado riesgo de contagio y morbi-mortalidad.

© 2020 Sociedad Española de Nefrología. Publicado por Elsevier España, S.L.U. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The pandemic caused by coronavirus SARS-CoV-2 resulted in more than a million deaths worldwide in 2020. The impact of the 2019 coronavirus disease (COVID-19) has generated serious health, economic and social consequences since its appearance a year ago in the People's Republic of China.¹ During this year of global fight against COVID-19, numerous drugs have been postulated as curative treatments for the disease, with a certain benefit found only in the use of corticosteroids in patients with moderate-severe disease.² Until now, research has focused its efforts on the development of vaccines against SARS-CoV-2 whose approval is imminent, allowing for mass vaccination in Spain.

The pandemic in Spain

The first case of illness from the coronavirus SARS-CoV-2 in Spain was described on the Canary Island of La Gomera, on 31 January. There, a German tourist who had been in contact with a sick person in his country of origin presented with symptoms of COVID-19 and was later diagnosed with the disease. Since that date, the incidence of infections and mortality related to the pandemic have not stopped growing. The most recent data from the Ministry of Health confirm more than 1.8 million infections in Spain with at least 50,000 deaths.³

Chronic kidney disease as a risk factor

From the first epidemiological analyses, it was observed that diabetic condition, arterial hypertension and cardiovascular disease constituted important risk factors for the development of COVID-19.⁴ The recently published study *OpenSAFELY* which included more than 17 million patients, revealed that age, male gender, obesity, smoking, ethnicity other than white

and numerous comorbidities including chronic kidney disease (CKD), but also respiratory disorders, chronic heart diseases, diabetes mellitus, cancer, liver diseases, dementia and a history of stroke and immunosuppression increase the risk of mortality in patients with COVID-19.⁵ In this study, patients with an estimated chronic reduction of glomerular filtration rate to less than 30 mL/min/1.73 m² chronically, had an increased mortality risk of 3.48 (3.23–3.75) times (adjusted for age and gender), increasing with greater deterioration in renal function. In addition to the CKD itself, this group of patients has a high prevalence of comorbidities such as diabetes mellitus, hypertension, lung disease, cardiovascular disease, obesity and fragility, which increases their risk of contracting COVID-19 and its complications.^{5–7} Meanwhile, among patients with kidney disease, those who require renal replacement therapy (RRT) (dialysis or kidney transplantation) are extremely vulnerable to the effects of COVID-19.⁸

The pandemic among people on renal replacement therapy in Spain

People on RRT in Spain have been hit hard by the pandemic. At the beginning of March, the Sociedad Española de Nefrología [Spanish Society of Nephrology] created the COVID-19 register, with the aim of analysing the incidence, risk factors and evolution of dialysis or transplant patients with COVID-19. From the very start, the high incidence of infection among these patients was evidenced, especially among haemodialysis patients in health centres.⁹ The factors that justify this circumstance include the impossibility of social distancing and regulatory isolation, and the need to travel to a health centre at least three times a week during times of maximum healthcare pressure. In addition, many of the patients who require chronic haemodialysis require collective transport and live in care homes, the epicentre of many infections.¹⁰ However, patients who perform home dialysis techniques were less

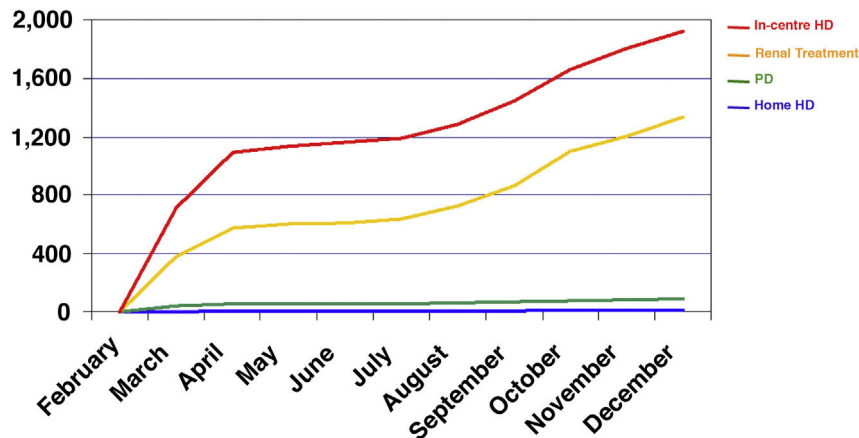


Fig. 1 – Evolution of COVID-19 in patients undergoing renal replacement therapy in Spain (data from the Spanish COVID-19 Register, updated as of 19 December 2020).

affected, which confirms the significance of social distancing as a protective measure against infection by SARS-CoV-2.¹¹

The evolution of the pandemic has continued to have a strong impact on people with kidney disease, having reached a contagion rate of 5% of the Spanish population in renal replacement treatment in December, exceeding 11% in the case of the Community of Madrid. At the time of writing, the number of patients included in the Register of the Sociedad Española de Nefrología is 3,363, of which 1922 correspond to patients on haemodialysis at a health centre, 1334 are kidney transplants, 91 on peritoneal dialysis and 16 on home haemodialysis (Fig. 1).

COVID-19 is not only very common among our patients, but it causes high mortality. Over the months of the pandemic, the analysis of the data from the Spanish register determined a mortality rate greater than 25% of the total number of infected patients on RRT, with haemodialysis patients being the most affected, with a mortality of 30%.^{12,13}

The Sociedad Española de Nefrología works continuously alongside the Ministry of Health in the development of action protocols to minimise the risks of contagion between staff and patients in haemodialysis units.^{14,15}

The impact of the pandemic among the healthcare staff of nephrology departments

The Sociedad Española de Nefrología has been carried a survey out among the medical personnel of nephrology departments. The most relevant conclusions confirm that 20% of nephrologists in Spain have already had COVID-19, with the lack of personal protective equipment being the most relevant associated factor. Likewise, older age, the need to work in areas other than Nephrology during the pandemic or greater exposure to patients with COVID-19 more frequently predetermined infection in professionals (*data not published*). At the same time, the pandemic has altered the healthcare activity of nephrology departments, reducing programmed activity and at times putting a stop to the kidney transplant programme.¹⁶

Justification for vaccination

Only a few months after the appearance of the first cases of COVID-19 in Europe, the first vaccines against SARS-CoV-2 are already available. There are currently 56 vaccines under clinical development and 166 under preclinical development.¹⁷ At the time of writing, the European Medicines Agency and the US Food and Drug Administration have urgently approved vaccines from the companies Pfizer-Biontech and Moderna. In fact, in the United Kingdom and the United States, immunisation of the population has already begun, while in the rest of Europe it is expected to begin imminently. The process of vaccinating the population will be long and the capacity of health systems to acquire and administer vaccines will cover at least the first six months of 2021.

On December 10th, the Spanish Minister of Health, Salvador Illa, appeared in the Spanish Parliament to report on the vaccination strategy against the SARS-CoV-2 in Spain.¹⁸ In his speech, he highlighted that during the first few weeks of the vaccination period, vaccines would be administered to the house staff and social and health care staff of care homes for the elderly and those with disabilities, as well as healthcare personnel working on the front line and those who are highly dependent and non-institutionalised, as they are the most vulnerable groups. The Sociedad Española de Nefrología contacted the health authorities and received an immediate reply from the General Directorate of Public Health, which stated the following: “Relying on current solid scientific evidence, patients with chronic kidney disease (particularly those undergoing renal function replacement therapy—dialysis or transplantation—) are at increased risk of severe disease from COVID-19. The vaccination strategy against COVID-19 provides for priority vaccination for those people who have pathologies or conditions with solid scientific evidence of a higher risk of serious disease, so these people have been included in the priority vaccination groups that will be vaccinated in the second stage of the strategy”.

The Sociedad Española de Nefrología, an organisation that watches over kidney health and cares for patients with kidney

disease and the health professionals dedicated to treating it, deems that:

- Patients with advanced CKD, especially those in need for RRT (dialysis and transplantation) should be considered by health authorities as high risk, both of contracting COVID-19 as well as of suffering consequences of this pathology, including death in a high percentage of cases.
- The risks are especially high in patients on a haemodialysis programme in health centres due to the impossibility of complying with social distancing and isolation measures.
- Patients with advanced CKD, especially those in need of RRT in Spain should be considered a priority for vaccination against SARS-CoV-2.
- Healthcare personnel who treat patients in RRT should also be prioritised when establishing immunisation strategies against COVID-19, given the close ties with vulnerable patients.

These recommendations from the Sociedad Española de Nefrología are in line with those dictated by other international organisations and societies.¹⁹⁻²²

Safety of vaccination in patients with kidney disease

Pivotal studies on vaccines authorised by the administration have demonstrated their safety and efficacy in the general population.^{23,24} Although at the present time we lack data specific to the population with kidney disease, we can consider that they are safe in this population. In the first place and unlike what we knew until now, the mechanism of action of the vaccines against SARS-CoV-2 does not consist of the inoculation of live or attenuated viruses, which could be compromising for a population in a situation of chronic immunosuppression. The first vaccines to be marketed are based on the inoculation of lipid nanoparticles of messenger RNA (mRNA) that synthesises the spike protein of SARS-CoV-2. This small genetic material penetrates the cells, reaching the ribosomes and stimulating the synthesis of this protein that will move to the cell membrane, generating the expected humoral response. That is, these genetically based vaccines instruct the host's cells to produce the antigen and subsequently the body itself generates antibodies against them without the presence of the SARS-CoV-2 virus.²⁵ It should be noted that with these vaccines there is no risk of genomic integration, since the process is in the cytoplasm and never penetrates into the nucleus. Secondly, although this technology is novel, its development has its origin more than 15 years ago, so its long-term safety is supported by scientific evidence.²⁶

For all these reasons, and with the information that we currently have available, we must reliably recommend priority vaccination of patients undergoing renal replacement therapy and the healthcare personnel who care for them in the initial moments of vaccination campaigns.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Appendix A.

The members of the Board of Directors of the Sociedad Española de Nefrología are: Gabriel de Arriba, Miquel Blasco, Gema Fernández Fresnedo, Sagrario Soriano, Francisco Javier Pérez Contreras, Auxiliadora Mazuecos, Marian Goicoechea, Manuel Gorostidi, María José Soler and Mariano Rodríguez Portillo.

REFERENCES

1. Organización Mundial de la Salud [Accessed 20 Dec 2020]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200413-sitrep-84-covid-19.pdf?sfvrsn=44f511ab_2.
2. Tomazini BM, Maia IS, Cavalcanti AB, Berwanger O, Rosa RG, Veiga VC, et al. Effect of dexamethasone on days alive and ventilator-free in patients with moderate or severe acute respiratory distress syndrome and COVID-19: the CoDEX randomized clinical trial. *JAMA*. 2020;324:1307-16, <http://dx.doi.org/10.1001/jama.2020.17021>.
3. Ministerio de Sanidad; Gobierno de España. [Accessed 19 Dec 2020]. Available from: <https://covid19.isciii.es/>.
4. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497-506, [http://dx.doi.org/10.1016/S0140-6736\(20\)30183-5](http://dx.doi.org/10.1016/S0140-6736(20)30183-5).
5. Williamson EJ, Walker AJ, Bhaskaran K, Bacon S, Bates C, Morton CE, et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature*. 2020;584:430-6, <http://dx.doi.org/10.1038/s41586-020-2521-4>.
6. United States Renal Data System [Accessed 20 Dec 2020]. Available from: <https://adr.usrds.org/2020>, 2020.
7. Bruchfeld A. The COVID-19 pandemic: consequences for nephrology. *Nat Rev Nephrol*. 2020:1-2, <http://dx.doi.org/10.1038/s41581-020-00381-4>.
8. Sim JJ, Huang CW, Selevan DC, Chung J, Rutkowski MP, Zhou H. COVID-19 and survival in maintenance dialysis. *Kidney Med*. 2021;3:132-5, <http://dx.doi.org/10.1016/j.xkme.2020.11.005>.
9. Sánchez-Álvarez JE, Pérez Fontán M, Jiménez Martín C, Blasco Pelicano M, Cabezas Reina CJ, Sevillano Prieto ÁM, et al. SARS-CoV-2 infection in patients on renal replacement therapy. Report of the COVID-19 Registry of the Spanish Society of Nephrology (SEN). *Nefrología*. 2020;40:272-8, <http://dx.doi.org/10.1016/j.nefro.2020.04.002>.
10. Fernandez-Prado R, Gonzalez-Parra E, Ortiz A. Often forgotten, transport modality to dialysis may be life-saving. *Clin Kidney J*. 2020;13:510-2, <http://dx.doi.org/10.1093/ckj/sfaa163>.
11. Maldonado M, Ossorio M, Del Peso G, Santos C, Álvarez L, Sánchez-Villanueva R, et al. COVID-19 incidence and outcomes in a home dialysis unit in Madrid (Spain) at the height of the pandemic. *Nefrología*. 2020;3:329-36, <http://dx.doi.org/10.1016/j.nefro.2020.09.002>. S0211-6995(20)30166-1.
12. Crespo M, Mazuecos A, Rodrigo E, Gavela E, Villanego F, Sánchez-Alvarez E, et al. Respiratory and gastrointestinal COVID-19 phenotypes in kidney transplant recipients. *Transplantation*. 2020;104:2225-33, <http://dx.doi.org/10.1097/TP.0000000000003413>.
13. Sánchez-Alvarez E, Macía M, de Sequera Ortiz P. Management of hemodialysis patients with suspected or confirmed COVID-19 infection: perspective from the Spanish nephrology. *Kidney360*. 2020;1:1254-8, <http://dx.doi.org/10.34067/KID.0002602020>.

14. de Sequera Ortiz P, Quiroga B, de Arriba de la Fuente G, Macía Heras M, Salgueira Lazo M, Del Pino Y, et al. en representación de la Sociedad Española de Nefrología. Protocol against coronavirus diseases in patients on renal replacement therapy: dialysis and kidney transplant. *Nefrologia*. 2020;40:253-7, <http://dx.doi.org/10.1016/j.nefro.2020.03.001>.
15. [Accessed 19 Dec 2020]. Available from: <https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19-hemodialisis.pdf>.
16. Soler MJ, Macia Heras M, Ortiz A, Del Pino Y, Pino MD, Salgueira Lazo M. Impact of the COVID-19 pandemic on Spanish Nephrology Services. *Nefrologia*. 2020;40:579-84, <http://dx.doi.org/10.1016/j.nefro.2020.08.002>.
17. [Accessed 19 Dec 2020]. Available from: <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines>.
18. Situación de la infección por SARS-CoV-2 en pacientes en tratamiento renal sustitutivo. Informe del Registro COVID-19 de la Sociedad Española de Nefrología (SEN) [Accessed 20 Dec 2020]. Available from: <https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=5163>.
19. UK Renal Community. COVID-19 vaccination for adult patients with kidney disease: A position statement from the UK renal community. Published December 4, 2020. [Accessed 4 Dec 2020]. Available from: <https://britishrenal.org/covid-19-vaccination-for-adult-patients-with-kidney-disease/>.
20. Krueger KM, Ison MG, Ghossein C. Practical guide to vaccination in all stages of CKD, including patients treated by dialysis or kidney transplantation. *Am J Kidney Dis*. 2020;75:417-25, <http://dx.doi.org/10.1053/j.ajkd.2019.06.014>.
21. Centers for Disease Control and Prevention. Understanding mRNA COVID-19 vaccines. [Accessed 4 Dec 2020]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html>.
22. Lurie N, Experton B. How to leverage the medicare program for a COVID-19 Vaccination Campaign. *JAMA*. 2021;325:21-2, <http://dx.doi.org/10.1001/jama.2020.22720>.
23. Folegatti PM, Ewer KJ, Aley PK, Angus B, Becker S, Belij-Rammerstorfer S, et al. Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial. *Lancet*. 2020;396:467-78, [http://dx.doi.org/10.1016/S0140-6736\(20\)31604-4](http://dx.doi.org/10.1016/S0140-6736(20)31604-4).
24. Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al. Safety and efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *N Engl J Med*. 2020;383:2603-15, <http://dx.doi.org/10.1056/NEJMoa2034577>.
25. De Francisco ALM, Available from: <https://www.nefrologiaaldia.org/es-articulo-interrogan-tessobre-la-vacuna-covid-19-355>, 2020.
26. Ceppi M, Ruggli N, Tache V, Gerber H, McCullough KC, Summerfield A. Double-stranded secondary structures on mRNA induce type I interferon (IFN alpha/beta) production and maturation of mRNA-transfected monocyte-derived dendritic cells. *J Gene Med*. 2005;7:452-65, <http://dx.doi.org/10.1002/jgm.685>.