Clinical study protocol

Effect of the Teleconsultation of Renal Nutrition on Renal Function and Glycemic Control in Patients With DKD

Protocol number: NCT03344549

Date: 30 october 2022

INTRODUCTION

Diabetic kidney disease (DKD) is the leading cause of end-stage renal disease(1). The progression of diabetic nephropathy can be delayed by optimal glycemic control. Nutritional therapy with sugar control and low protein diets (0.8 g/kg/day) are the most recommended (2) however, it is difficult to achieve compliance (3). The dimensions of chronic kidney disease show it as a public health problem that requires the creation of new interventional and educational programs (4). Telehealth may improve clinical outcomes, care coordination, engagement, and satisfaction.

METHODS

Primary objective

The main goal of the study, a randomized and controlled study, is to determine a difference between the nutritional intervention through teleconsultation and the face-to-face consultation in patients with diabetic kidney disease in stage G3a, G3b and G4.

Study design

The trial will be a prospective, randomized, open, controlled design that will last 4 months. The trial was registered in the clinicaltrials.gov registry (ClinicalTrials.gov identifier: NCT03344549).

Study population

A total of 53 adult volunteers with a diagnosis of DKD will be recruited for this study. To be eligible in the trial, subjects must fulfil all of the inclusion criteria and none of the exclusion criteria, as stated below.

The following inclusion criterio will be adopted:

(1) Outpatients aged 18–80 years.
(2) With DKD with eGFR <60 ml / min / 1.73m2 and ≥ 15 ml / min / 1.73m2, (stage G3a, G3b and G4 respectively).
(3) Written informed consent to participate in this study before any study-mandated procedure.
(4) Who have access to the internet and have a computer, tablet or smartphone.
(5) A willingness and motivation to follow the study protocol.

The exclusion criteria will be as follows:

(1) Outpatients who have received prior nutritional treatment for the control of diabetic kidney disease.

(2) The use of food supplements and / or keto analogues.

(3) Diagnosis of anemia or recent transfusions (in the last 3 months).

(4) With serious complications (chronic infection, septicemia, cancer, HIV, Alzheimer's, uncontrolled heart failure, liver failure, refractory arterial hypertension, etc.).

(5) Patients with serious difficulties in communication or intellectual deficit that impedes the ability to understand the intervention.

Reasons for the participant to be discontinued from the study:

(1) Withdrawal of informed consent.

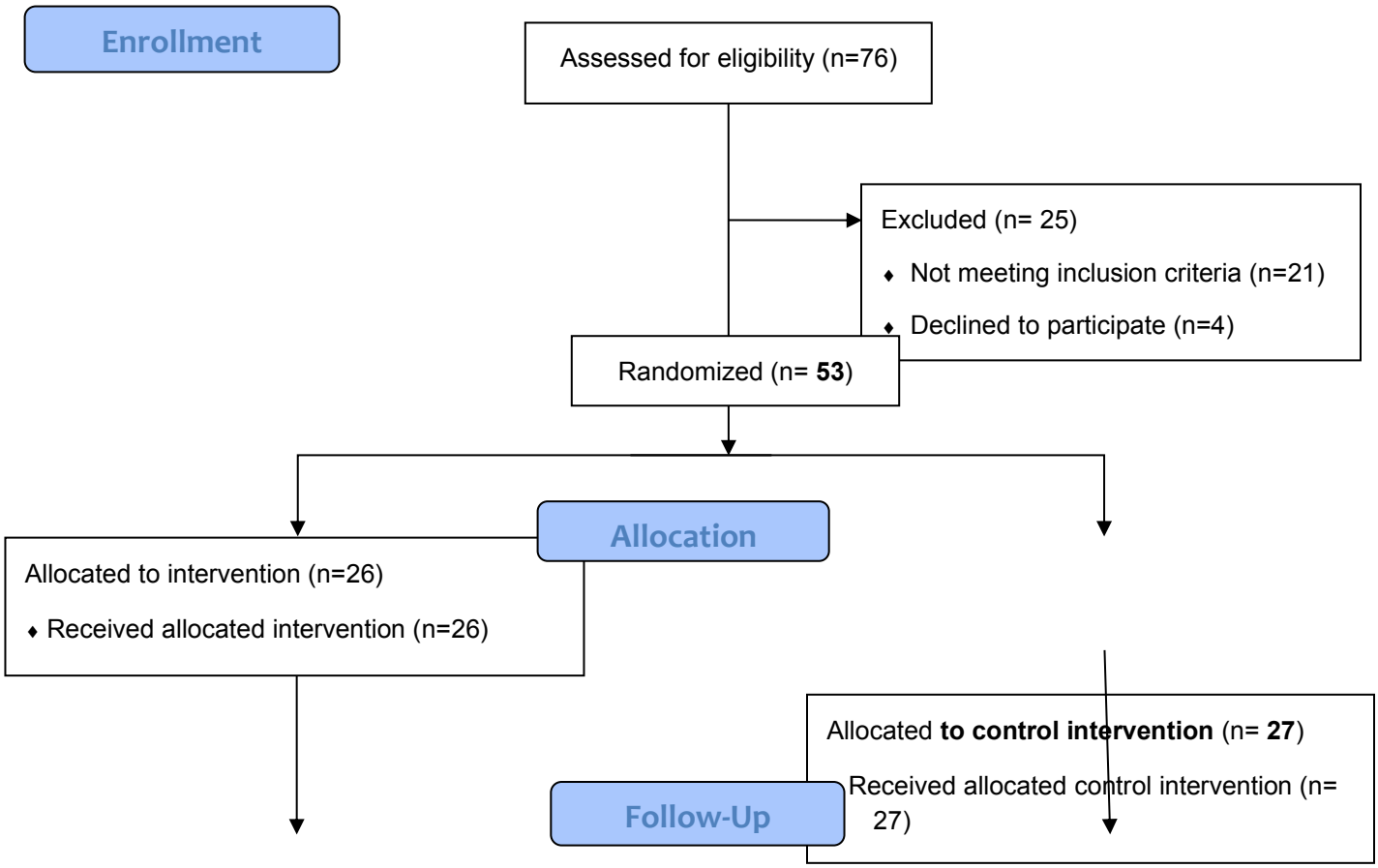
(2) Non-attendance at the study visits (≥ 2 nutritional interventions),

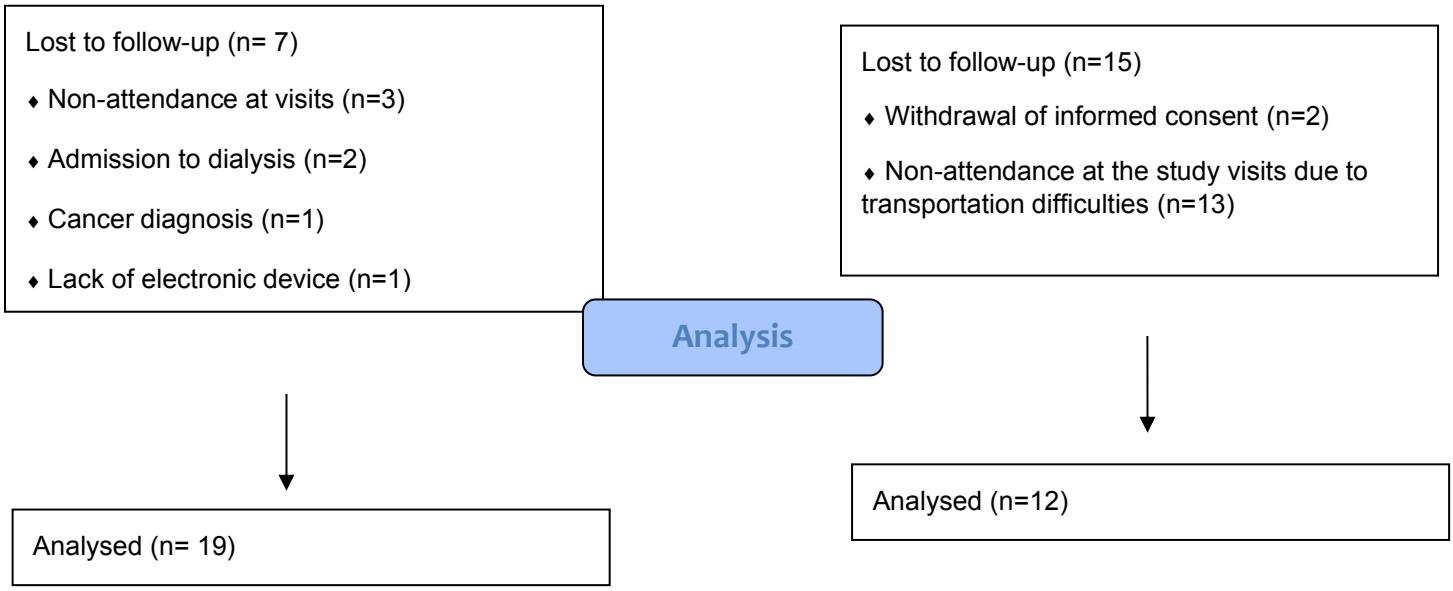
(3) Exclusion criteria found after enrollment, and

(4) Any serious adverse event during the intervention period (based on data safety monitoring).

(5) Admission to dialysis

Figure 1. CONSORT Flow Diagram





Sample size calculation

For the calculation of sample size, the formula was used to compare means of independent samples. A size of 27 patients per group was estimated, considering an expected difference in the Glycated Hemoglobin percentage of 0.7 reported in a previous study (6).

Randominzation

Randomization was performed using the simple method without replacement with sealed envelopes. Recruited individuals will be allocated into one of two groups:

(1) Teleconsultation (n =26)

(2) Face to face consultation (n =27)

DIETARY INTERVENTIONS

The teleconsultation group received nutritional therapy by video call in real time, with a monthly frequency for 4 months. The consultation includes the evaluation or reevaluation, diagnostic treatment and educational approach. Failure to attend more than two consultations is considered an exclusion criterion.

The Face to face consultation group, received nutritional therapy through face-to-face consultations in the hospital with a monthly frequency for 4 months. The consultation includes the evaluation or re-evaluation, diagnosis, treatment and educational approach. Failure to attend more than two consultations is considered an exclusion criterion.

DATA ANALISIS PRINCIPLES

To determine the difference between the nutritional interventions, the following changes from the baseline (I1) to the end of the study (I6) will be determined as primary outcomes:

(1) Renal function with de the determination of the changes in the estimated glomerular filtration rate (eGFR)

(2) Glycemic control with the determination of the changes in the Hemoglobin A1c (HbA1c)

To evaluate the adhrence to nutritional interventions were determined as secondary outcome:

(1) Level of compliance, was assessed using a self-reported Likert scale. Being the score 10 = good adherence and the score 1 = poor adherence to treatment.

STUDY PROCEDURES

The detection of patients is carried out in the nephrology department of the Juan I. Menchaca hospital, both in the morning and afternoon sessions. The identification of patients is carried out during the consultation with the nephrologist, where the selection criteria are evaluated and the patient is invited to participate in the study and to sign the agree consent.

After the patient's acceptance to participate in the study, the initial evaluation is carried out, which includes contact, demographic, anthropometric and dietary data; and the patient is trained to fill the dietary record at home. Anthropometric data are evaluated by standardized nutritionist trained with the correct technique. Venous blood was collected by qualified nurses. The biochemical indicators are requested by the nephrologist at the time of the consultation and the results of these are obtained from the institution's own data system.

After the initial evaluation, the probabilistic group assignment is carried out with the simple method without replacement, which is carried out using a sealed envelope. After the appointment of the group, the patient is scheduled for his first nutrition consultation (both arms).

In the teleconsultation group, two days before the first nutrition consultation, the patient is advised by telephone - or the family member in charge - about the use of the free technological tool to be used during the video conference.

In the patients of the intervention group, the nutritional intervention is carried out through teleconsultation with the free technological tool chosen (the patients from home and the

nutritionist from the remote clinic); and the patients of the control group are offered the nutritional intervention through face-to-face consultations carried out by the nutritionist of the nutrition service of the institution. All patients will be confirmed by phone the date and time of their next nutrition consultation, both the control group and the intervention group (Table.1)

Table 1. Timeline of the study

Time (weeks) from start of dietary intervention	Pre-baseline	Study period					Close-out
		Baseline					
	(I0) Week -1	(I1) Week 0	(I2) Week 4	(I3) Week 8	(I4) Week 12	(I5) Week 16	(I6) Week 18
Screening and sign the agree consent.	x						
Randomization	x						
Socio-demographic data	x						
Blood serum measurements	x						x

Dietary habits	x						x
Anthropometric measures	x						x
Nutritional intervention		x	x	x	x	x	
Level of compliance			x	x	x	x	

Data colletion

The following clinical/dietary information was obtained:

- Socio-demographic data (a questionnaire).
- Dietary habits: a 3-day food record.
- Vital signs: blood pressure.
- Anthropometric measures: weight, height, body mass index (BMI).
- Gastrointestinal symptoms: frequency and duration.

In the blood serum, we evaluated markers of glucose, and hemoglobin A1c; serum creatinine, urea, albúmin and blood biometry.

STATISTICAL ANALISIS PLAN

Categorical variables are presented as numbers and percentages, and comparisons between groups were performed with the chi-square or Fisher exact test as appropriate. According to

the Shapiro–Wilk test for data distribution, continuous variables are summarized as the means ± standard deviations (SD) if normally distributed or medians and interquartile ranges (25–75th) if non-normally distributed and were compared using Student's t-test or the Mann–Whitney U test, respectively. For variables measured at multiple time points, repeated measures analysis of variance tests were used for the comparisons between groups For the analysis of the interaction or intervening variables, a stratified statistical analysis will be carried out, using contingency tables and the Mantel-Haenszel method. All tests were two-tailed, and a p value less than 0.05 were considered significant. Statistical analysis and graphics were performed with IBM® SPSS® Stadistics Ver. 22).

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The trial was conducted in accordance with the principles of the Declaration of Helsinki and the International Conference on Harmonization Guidelines for Good Clinical Practice. All patients gave their written informed consent before any study-related procedure. The study was approved by the local ethics committee (14 CEI 14 039 048), was prospectively registered in clinicaltrials.gov (NCT03344549). No funding was received to conduct this study. The clinical trial was carried out under the CONSORT guidelines.

Informed consent was obtained from all subjects. All methods were carried out in accordance with relevant guidelines and regulations. All experimental protocols were approved by the Institutional Review Board "Comité de ética en Investigación del OPD Hospital Civil de Guadalajara Dr. Juan I. Menchaca"

CONSENT FOR PUBLICATION

INFORMED CONSENT FORM FOR MINIMAL RISK STUDY

Date: _____, Guadalajara Jalisco, México.

I hereby agree to participate in the research project entitled:

"Effect of the Teleconsultation of Renal Nutrition on Renal Function and Glycemic Control in Patients With DKD"

I understand that the purpose of this study is to identify the effect of remote nutrition intervention on glycemic control and kidney function in people with diabetic chronic kidney disease. Adequate nutrition plays an important role in the treatment of diabetes and chronic kidney disease, it has been shown that it is essential to slow down the deterioration of kidney function.

It has been explained to me that my participation will consist of:

1. I will answer a questionnaire about personal, socio-demographic data and history of illnesses.

2. They will take measurements of my nutritional status including weight, height, arm circumference and triceps skinfold.

3. They will request blood tests from me at the beginning, at the middle and at the end of the study.

4. I will attend 5 monthly nutrition consultations in the hospital or at home.

5. I will adhere to the indicated medical and nutritional recommendations.

I declare that I have been fully informed about the possible risks, inconveniences, perjury and benefits derived from participation in the study. Which are the following:

Risks: It is important that you provide true and complete information about your medical history and health status. During this study you will not receive any extra medication than the usual ones for the treatment of your disease, we will closely monitor you, and we will make sure that you receive the appropriate treatment in case you develop any complications. The nutritional evaluation, as well as the obtaining of blood samples, do not imply risks to your health.

Benefits: the main benefit is to identify whether remote nutritional intervention maintains renal function and glycemic control in the population with chronic kidney disease. This will give the opportunity to implement this modality in other people with kidney disease. You will be closely monitored by a team of specialist doctors and nutritionists to avoid any complications. All the information obtained from this study will be handled with discretion, maintaining the confidentiality of the data.

The responsible investigator has agreed to give me timely information about any appropriate alternative procedure that could be advantageous for my treatment, as well as to answer any questions and clarify any doubts that may arise about the procedures that will be carried out, the risks, benefits or any other matter related to the research or my treatment.

I understand that I have the right to withdraw from the study at any time I deem necessary, without affecting future medical care.

The responsible investigator has assured me that I will not be identified in the presentations or publications that derive from this study and that the data related to my privacy will be handled confidentially. He has also agreed to provide me with updated information that is obtained during the study, even if he could change his mind about my remaining in the study.

_____

Patient name and signature

_____

Name and signature of the responsible investigator

_____

Name and signature of the first witness

_____

Name and signature of the second witness

_____

The telephone number to which you can contact in case of questions related to the study is: 044 33 35 76 22 99.

REFERENCES

1. García-García G, Márquez-Magaña I, Renoirte-López K, et al. Screening for kidney disease on World Kidney Day in Jalisco, J Nephrol. 2010; 23(02): 224 – 230.

2. American Diabetes Association. Standards of medical care in diabetes. Diabetes Care. 2017; 40 (1): S1 – S135.

3. Bellizzi V. Low-Protein Diet or Nutritional Therapy in Chronic Kidney Disease?. Blood Purif. 2013; 36 :41–46.

4. Martínez-Ramírez HR, Cortes-Sanabria L, Rojas-Campos E, et al. Multidisciplinary strategies in the management of early chronic kidney disease. Archives of Medical Research. 2013; 44: 611 - 615.

5. Klug C, Bonin K, Bultemeier N, et al. Integrating Telehealth Technology into a Clinical Pharmacy Telephonic Diabetes Management Program. J Diabetes Sci Technol.2011; 5(5): 1238 – 1245.

6. Meloni C, Morosetti M, Suraci C, et al. Severe dietary protein restriction in overt diabetic nephropathy: ¿benefits or risks?. J Ren Nutr. 2002; 12(2): 96 – 101.