

INFLUENCE OF HbA1c AND LOW PHOSPHORUS DIET ON COGNITIVE IMPAIRMENT IN CHRONIC HEMODIALYSIS DIABETIC PATIENTS

Autors: Andra Stroescu-Balcangiu¹, Andrei Nicolae¹, Daniela Radulescu¹, Cristiana David¹, Ileana Peride¹, Elena Poenaru², Ionel-Alexandru Checherita¹

¹ST. JOHN, EMERGENCY CLINICAL HOSPITAL, CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY, BUCHAREST, NEPHROLOGY, Bucharest, ROMANIA, ²CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY, BUCHAREST, Biostatistics, Bucharest, ROMANIA

OBJECTIVES

Chronic hemodialysis and diabetes are conditions associated with the occurrence of cognitive disorders. In patients undergoing chronic dialysis, hyperphosphatemia is associated with arterial stiffness, which is involved in cognitive disorders. The emergence of cognitive disorders in diabetic patients is due both to degenerative changes in the brain generated by advanced glycosylation products and to disorders caused by micro-angiopathy.

This study aims to demonstrate whether serum phosphate levels and glycosylated hemoglobin (HbA1c) influence the severity of cognitive disorders in diabetic patients on chronic hemodialysis. It also aims to prove whether a low phosphorus diet and controlled daily diet based on carbohydrates can improve cognitive disorders

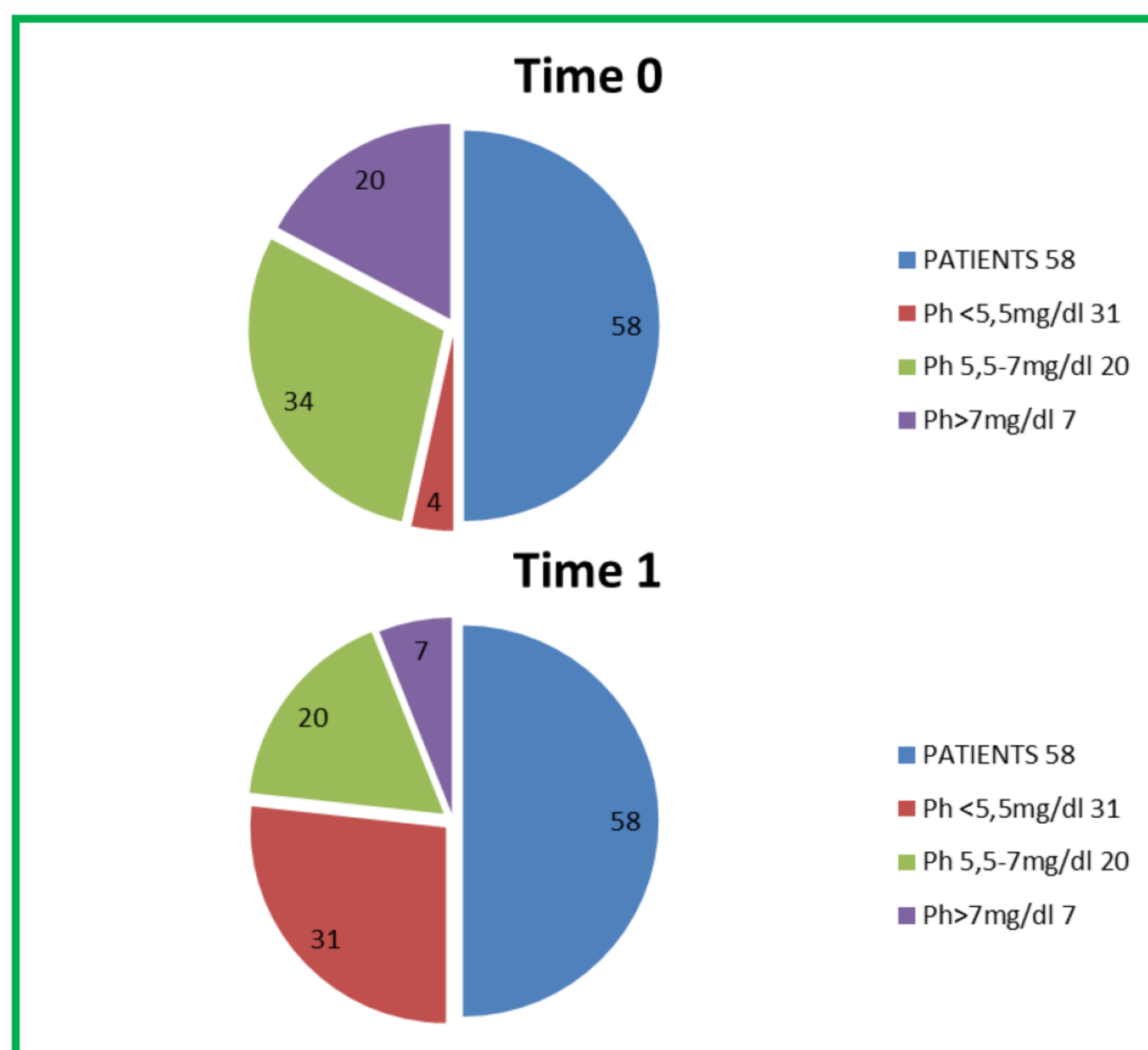
METHODS

We conducted an experimental analytical study for a period of 4 months, from June to September 2014, on a group of 58 patients with diabetes and chronic hemodialysis. The group was homogeneous concerning sex and age.

All patients were aged between 50 and 80 years. At the baseline and the end of the study, patients were collected blood samples to check serum level of phosphorus, glucose and glycosylated hemoglobin; Beck and Hamilton tests were also applied for assessing cognitive disorders.

Patients were advised to take chelating phosphorus specific medication and follow a low phosphorus diet as well as 200 g carbohydrate (HC) daily. Data was collected in two stages, at the beginning and at the end of the study and was statistically analyzed.

CHARTS



RESULTS

34 (59%) patients show values of serum phosphate between 5.5 and 7 mg/dl.

In 20 patients (34%) serum phosphate was above 7 mg/dl. 78% of patients with serum phosphate > 7 mg/dl presented glycosylated hemoglobin > 9% and at the evaluation of cognitive disorders the patients were diagnosed with depression.

In patients with serum phosphate between 5.5 and 7 mg/dl glycosylated hemoglobin level was < 9% in 82% of cases.

The tests of cognitive disorders indicated panic disorders by various degrees in the examined patients. After 4 months, out of the patients who at baseline showed a serum pH between 5,5 - 7mg/dl, only 14 followed the specific medication and the dietary recommendations, showing also an improvement of cognitive disorders ($p < 0.005$).

In the subgroup of patients who at baseline had a serum phosphate value higher than 7mg/dl, 13 patients were compliant to medication and dietary recommendations. At the end of the evaluating study they presented a value of serum phosphorus < 7mg/dl, a glycosylated hemoglobin < 9% and improvements of cognitive disorders ($p < 0.005$);

in the rest of 7 patients, elevated phosphate values and HbA1c persisted, and the tests of cognitive disorders indicate depression ($p < 0,001$).

CONCLUSIONS

Beck and Hamilton tests indicate that diabetic patients on chronic hemodialysis with serum phosphate values > 7mg/dl and HbA1c > 9% are diagnosed with depression. Low phosphorus diets and optimal intake of carbohydrates together with specific chelating phosphorus medication lead to improving cognitive disorders. Measures to correct hyperphosphatemia and to maintain good glycemic control should be applied even since predialysis, in order to obtain better results.

ACKNOWLEDGMENT

This paper was co-financed from the European Social Fund, through the Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/138907 "Excellence in scientific interdisciplinary research, doctoral and postdoctoral, in the economic, social and medical fields -EXCELIS", coordinator The Bucharest University of Economic Studies.

