

Background

Chronic Kidney Disease (CKD) : According to the French Authorities around 10% of the French population may suffer from CKD. The outcome of CKD is death, or renal replacement therapy (RRT). RRT is costly, around 4.18 Billion Euros are spent annually by the French National Insurance to cover this expenditure, dialysis represent 80% of this budget while kidney graft is only 20%. However, a shortage of functional kidneys exists limiting the number of grafts.

CKD is a disease with grim outcomes, and it is worsen when the patient is also suffering from **Type 2 Diabetes**. (T2D) T2D is both an accelerator and a cause from CKD. Coping with diabetes is therefore essential to ensure a better life. Many treatments exist for T2D : ranging from better eating habits to oral medication such as metformin or insulin jab.

The **aim of the study** was to assess the effectiveness of anti-diabetes treatment in the kidney function degradation. Using real-world data from the ND-CRIS cohort and a propensity score we matched patients in order to compare the GFR loss between two visit.

Methods

Data

We used real world data from an excerpt of the french cohort ND-CRIS (Non Cialysis Chronic Renal Insufficiency Study). This cohort was set up in 2012 and followed patient until 2017. A total of 4012 patients were included in the study of which **1598** were suffering from diabetic kidney disease. Among them, 902 had at least two GFR measures.

Missing Data

Multiple imputation was used for handling missing data. 70 imputations were used to match the percentage missing value from the most missed measure. We only used multiple imputation for the quantitative variables.

Propensity Score

The use of a propensity score allows us to match patients in order to simulate a clinical trial. We used a 1:1 matching ratio and a caliper of 0,01. The following variables were used : sex, risk factors (heart failure history, heart fibrillation, high blood pressure, smoking history, cancer history), GFR at inclusion, calcium blood rate, phosphorus blood rate, vit D blood rate

Results

At inclusion, the mean age was 73 years old, the mean GFR was 32,47 ml/min/1,73m² corresponding to advance CKD (class IV) on the KDIGO scale) Of the 903 patients selected, 13% had no treatment, 36% had an oral antidiabetic treatment and 30% had insulin only antidiabetic treatment. Over the whole période, 96 patients progressed to end-stage renal failure.

On average, patients showed a loss of 7,5% of GFR between consultations.

Each treatment had their own group, for a total of 4. The no treatment group served as reference, while other treatment were matched against. The propensity score, a quasi-experimental method was used, and mimic a randomization.

A linear regression was used , a simple equation was used.

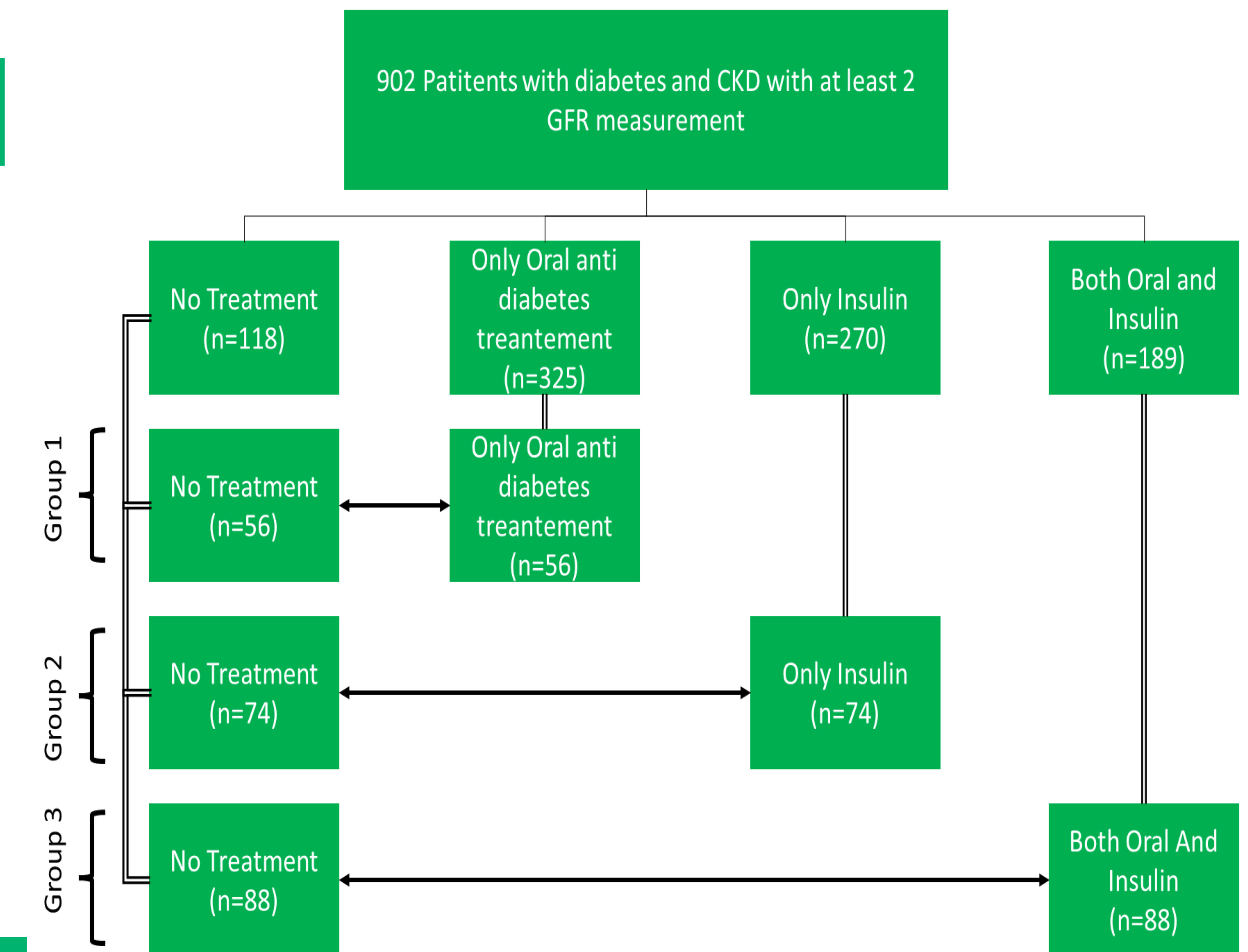
$$\Delta\text{GFR} = \text{PS} \cdot \text{X1} + \beta$$

The use of such a simple equation is due to the confounder lying in the propensity score. Using more control variable would enhance bias.

Group		Estimate	Standard Error	T-value	Pr > t
1	Intercept	-0,00194	0,01441	-0,13	0,8933
	Diabetes Treatment	-0,03056	0,02038	-1,50	0,1367
2	Intercept	-0,00391	0,00339	-1,15	0,2509
	Diabetes Treatment	0,00106	0,00240	0,44	0,6594
3	Intercept	-0,00438	0,00255	-1,71	0,0882
	Diabetes Treatment	-0,00039488	0,00121	-0,33	0,7439

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No significant differences were found between the groups. Such a result might be caused by the lack of posology accountability. However the lack of difference implies that all treatment protect the renal function, as soon as the implementation of hygiemo-dietetic rules. This statement confirms the similarity between the kidney protective diet and the anti-diabetic diet and implies a greater involvement from nutritionnist than today in order to protect the kidney.

Conclusion

As the analyses showed no significant results on the clinical differences of the antidiabetic treatments, all treatments work to protect renal function.