

Impact of Endothelial Nitric Oxide Synthase gene Polymorphism G894T

On the Development of Type-2 Diabetes

Toukabri I¹, Ouni Z.^{1,2}

¹: Hopital Militaire Principal d'Instruction de Tunis (HMPIT)

²: Faculté de pharmacie de Monastir



N°6ER-023

ATC code: -

Objectives

Type 2 diabetes (T2D) is a multifactorial disease characterized by the severity of its complications. In addition to traditional risk factors, many emerging factors are now described as certain genetic polymorphisms.

The objective of this study was to evaluate the place of G894T polymorphism of the eNOS gene as a new risk factor for T2D.

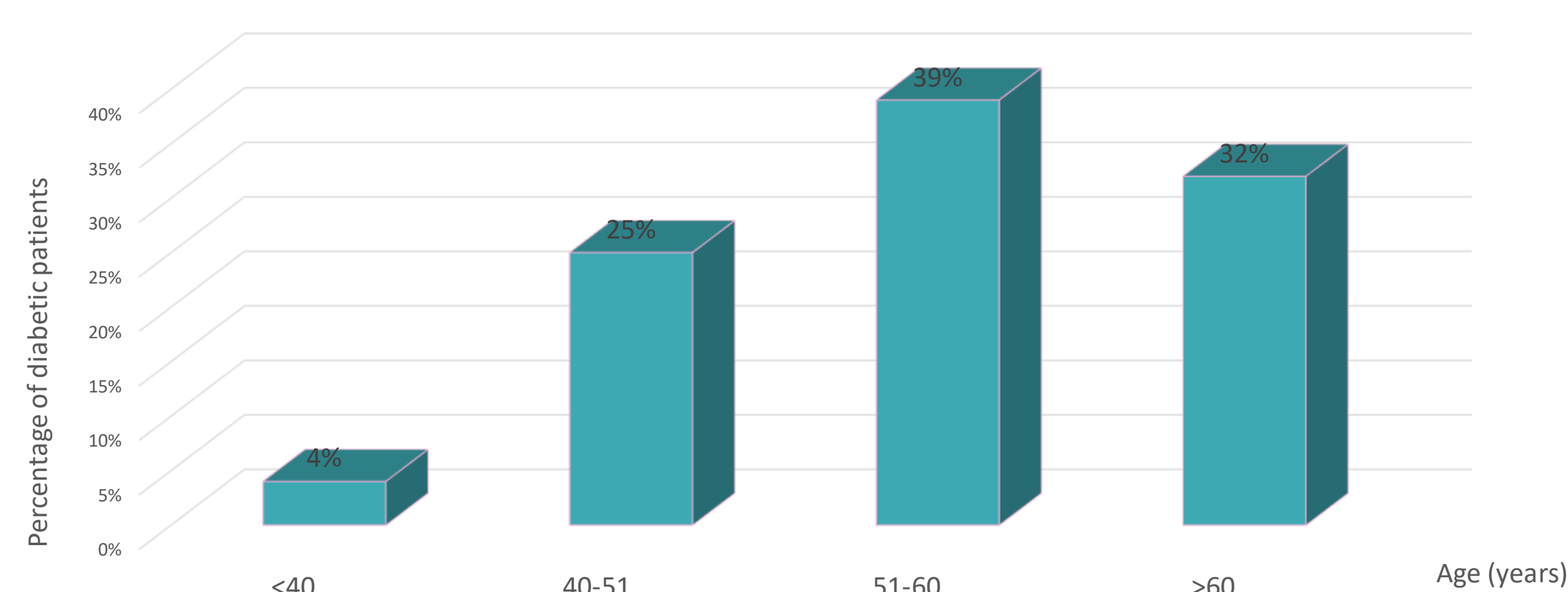
Study design

The study was carried out at the department of biochemistry in collaboration with the department of endocrinology. We conducted a case-control study including a group of patients with T2D and a group of non-diabetic controls. The patient group included 100 type 2 diabetic subjects, who were hospitalized in endocrinology department and whose age ≥ 18 years old. The control group included 100 non-diabetic subjects in good health, receiving no treatment and whose age ≥ 18 years old. These latter were recruited from medical staff and volunteers. Questioning was conducted for each patient and control to fill clinical information sheet. For each patient and control we sought G894T polymorphism of the eNOS gene by PCR-RFLP technique. The statistical analysis of the collected data was analyzed using an SPSS statistical software version 19.0

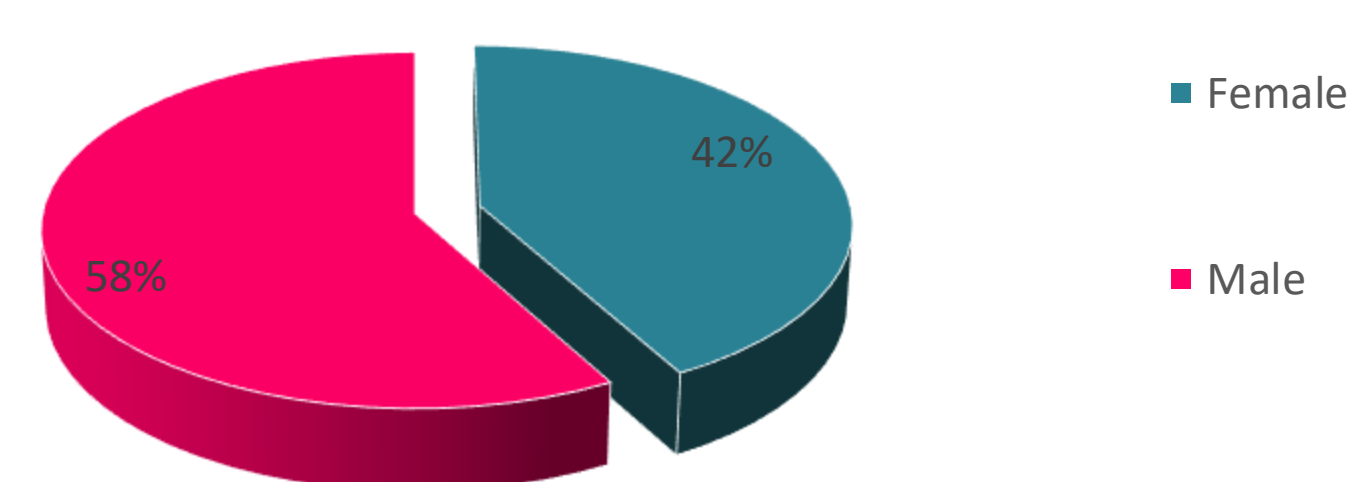
Results

Description of study population

Distribution of diabetic patients by age

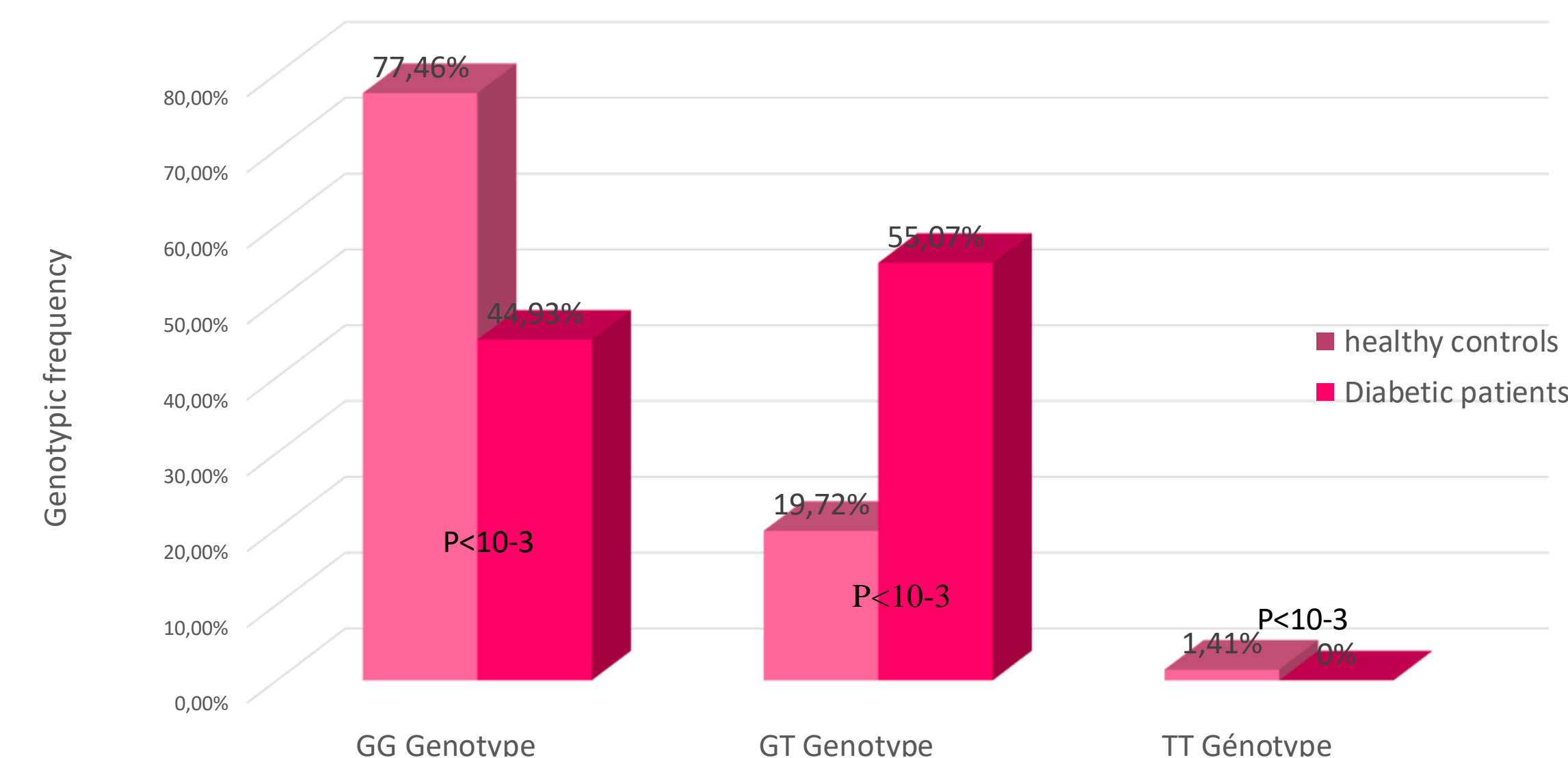


Distribution of diabetic patients by gender

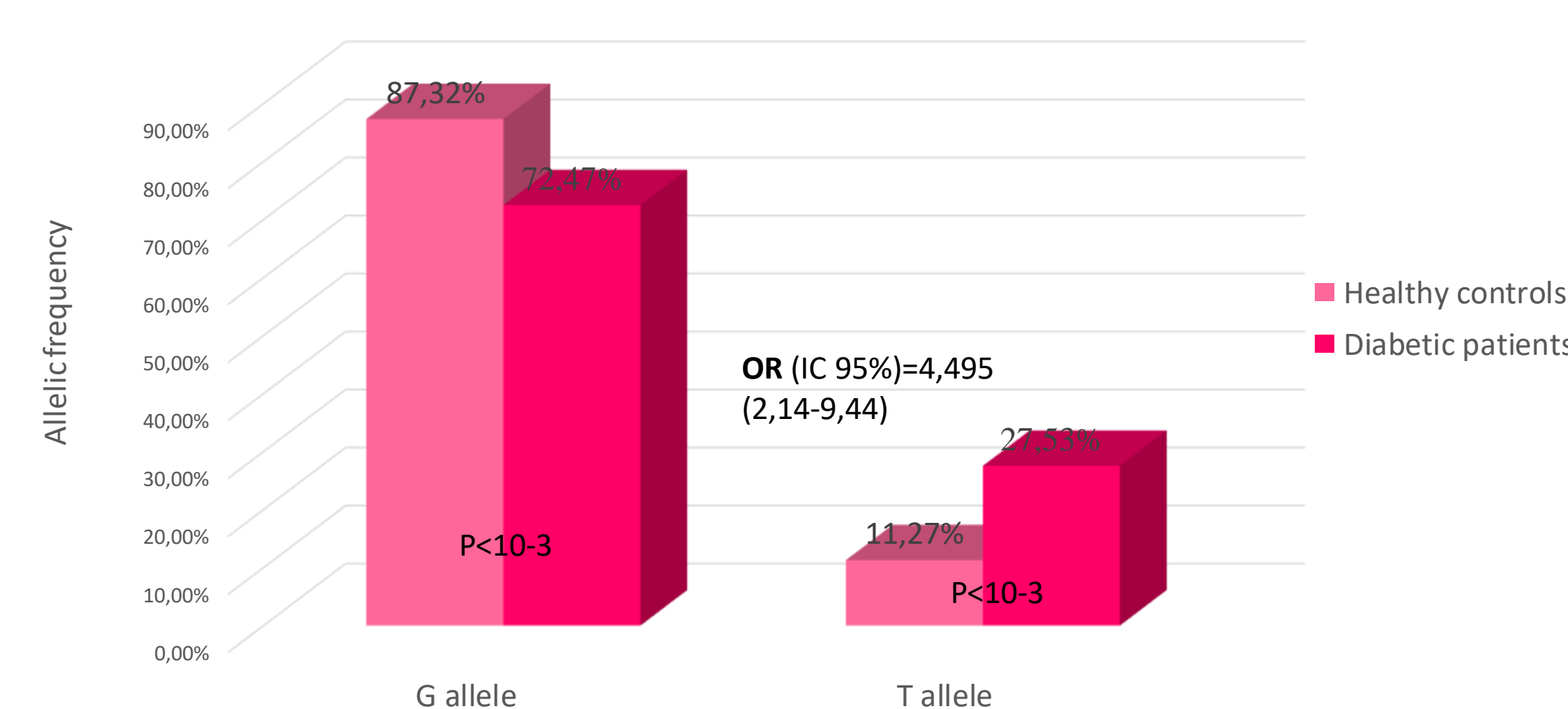


Study of genotypic and allelic frequency

Comparison of the frequency of eNOS genotypes between diabetics and healthy controls



Distribution of alleles in the two groups studied



Discussion

The analysis of our results shows that the mutated heterozygote genotype (GT) is more common in diabetics (55.07%) compared to controls (19.72%). This difference is statistically significant. The Odds Ratio calculation shows that the presence of the T allele increases the risk of type 2 diabetes (OR = 4.495, 95% CI = 2.140-9.449). Some studies found similar results (Angeline and al [1], Santos and al [2], Bessa and al [3]...). Indeed, the G894T polymorphism is responsible for a decrease in the activity of eNOS and subsequently a decrease in the rate of nitric oxide. This generates a state of oxidative stress that may be responsible for insulin resistance but also complications of type 2 diabetes.

Conclusion

G894T polymorphism of the eNOS gene may be related to the development of T2D among Tunisians. Further studies involving larger populations would be of great value to conclude the correlation between G894T polymorphism of eNOS gene and T2D.

References:

- [1] Angeline and al. Endothelial nitric oxide synthase gene polymorphism (G894T) and diabetes mellitus (Type II) among South Indians. *Oxidative Med Cell Longev*. 2011; 2011: 1-4.
- [2] Santos and al. Association of eNOS gene polymorphisms with renal disease in Caucasians with type 2 diabetes. *Diabetes Res Clin Pract*. 2011; 91(3):353-62.
- [3] Bessa and al. Impact of nitric oxide synthase Glu298Asp polymorphism on the development of end-stage renal disease in type 2 diabetic Egyptian patients. *Ren Fail*. 2011; 33(9):878-84.