



ABSTRACT

Type 2 Diabetes (T2D) is a multifactorial disease whereas genetics and environmental factors play a crucial role in its pathogenesis. Present research was designed to evaluate the association of fat mass and obesity (*FTO*) gene with the development of T2D. We have checked the inheritance pattern of *FTO* among diabetic families. For this purpose, blood samples were taken from 10 Pakistani families which included both diabetic and non-diabetic individuals. Two SNP's from *FTO* gene rs9939609 and rs17817449 were selected for genetic analysis. Genotypic analysis was performed by polymerase chain reaction (PCR) and Sanger sequencing. We evaluated that males were at high risk than females. Important risk factors are positive family history and obesity in onset of T2D. Genetic analysis of SNP's rs9939609 and rs17817449 showed that only SNP rs9939609 was associated with T2D but rs17817449 did not have any contribution in T2D. The genotype A/T for rs9939609, both heterozygous AT and homozygous TT mutations were identified in diabetic families were shown to be associated with T2D. The genotypic and phenotypic pedigree analysis showed the association of SNP rs9939609 in diabetic families. While, rs17817449 polymorphism had no effect on T2D. It was concluded that *FTO* polymorphism have serious health hazardous and continuously effecting large number of Pakistani population.