

ABSTRACT

Glaucoma is a group of optic neuropathies characterized by the dynamic degeneration of retinal ganglionic cells. It is clinically and innately heterogeneous disease consisting of different types, each with various causes and severities. Primary open-angle glaucoma (POAG) is the most common type of glaucoma. The current study was conducted to evaluate the genetic association of *SLX6* gene with pathogenesis of glaucoma in Pakistani population. *SLX6* gene plays an important role in ocular development and has been associated with morphology of the optic nerve. Two single nucleotide polymorphisms (SNPs; rs10483727 and rs33912345) at the *SLX6* locus on chromosome 14q22.3-q23.1 were selected for genetic analysis. A total of 100 patients clinically diagnosed with glaucoma and 100 control individuals of age over 30 were recruited in this study. Cases and controls were age and sex matched. Genomic DNA was extracted by organic extraction method. Genotyping of SNPs was done by (i) PCR based restriction fragment length polymorphism (RFLP) and sequencing method for rs10483727 (*NdeI*) and (ii) direct sequencing for rs33912345. This study has revealed that people over 40 years of age are at high risk of glaucoma. BMI of glaucoma patients was found to be quite normal. Positive family history was found a major risk factor for glaucoma in Pakistani population. In genetic analysis, significant genetic association ($p < 0.05$) was observed for SNP rs33912345 with POAG While SNP rs10483727 was not found to be associated with POAG in studied Pakistani population. In SNP rs33912345, mutation led to the change in amino acid sequence (Alanine into Glutamic Acid). Present study demonstrated that haplotype "TA" was strongly associated with POAG while haplotype "TC" was protective against glaucoma onset. No significant linkage disequilibrium was observed between these SNPs. In conclusion, current study indicated that age over 40 years, positive family history and SNP rs33912345 were significantly associated with POAG in Pakistani population. Moreover, current findings support the association of *SLX6* gene with pathogenesis of glaucoma. However, further studies are needed to delineating the role of these SNPs in POAG development.