

CYP1B1 Gene Mutation Impact on Prognosis of Primary Congenital Glaucoma

Thesis

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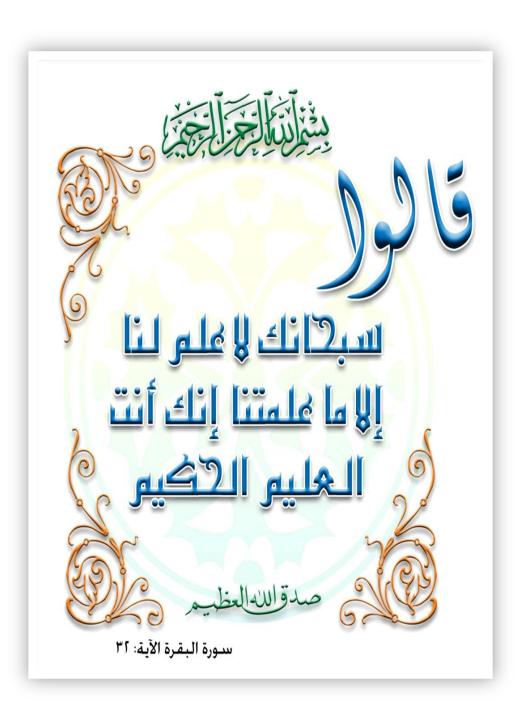
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List of Abbreviations

Abbrev.		Full-term
AA AC	:	Arachidonic acid Anterior chamber
AH	:	Aqueous humor
A119S	:	Polymorphism of alanine amino acid changed to serine. (non disease causing)
A443G	:	Mutation of alanine amino acid changed to glycine. (non disease causing)
ASD	:	Anterior segment dysgenesis
CCS	:	Conserved core structure.
CDR	:	Cup/disc ratio
Cm	:	centiMorgan unit of recombinant frequency which is used to measure genetic distance.
CW- TSCPC	:	Continuous wave transscleral cyclophotocoagulation
CYP1B1	:	Cytochrome P450 family 1 subfamily b
D430Afs*2	:	The frameshift mutation where aspartate amino acid was changed to alanine as a first amino acid affected by the change.
D449D	:	Polymorphism with no amino acid change. (non disease causing)
DNA	:	Deoxy ribo nucleic acid
dNTPs	:	Deoxy nucleotide triphosphate
E173K	:	Mutation of Glutamate Amino acid changed to lysine
EETs	:	Epoxyeicosatrienoic acid regioisomers

ECM : Extra cellular matrix

EUA : Examination under anesthesiaFDA : Food and drug administration

G329A : Mutation of Glycine Amino acid changed to

alanine

G61E : Mutation of Glycine Amino acid changed to

Glutamate

GSH : glutathione

HETEs: hydroxyeicosatetraenoic acids

H2O2 : Hydrogen peroxide

IOP : Intraocular pressure

KCL : Potassium chlorideLM : longitudinal muscle

LTBP2: Latent transforming growth factor beta

binding protein 2

MgCl2 : Magnesium chloride

MMC: Mitomycin C

MP- : Micro pulse transscleral cyctophotocoagulation

NAC : N-acetylcysteine

N453S : Polymorphism of aspargine amino acid

changed to serine. (non disease causing)

NCBI : National center for biotechnology

information USA

OD : Oculus dextrus = right eye

OMIM : Online Mendelian inheritance in man

OS : Oculus Sinistrus = left eye

OU : Oculus Uterque = both eyes.

PCG: Primary congenital glaucoma

PCR : Polymerase chain reaction

RA : Retinoic acid.Postn : periostin gene

ROS : Reactive oxygen species

R368H: Mutation of arginine Amino acid changed

to Histidine at position 368

R469W: Mutation of arginine Amino acid changed

to tryptophan at position 469

R444Q : Mutation of arginine Amino acid changed

to glutamine

R48G: Polymorphism of arginine amino acid

changed to glycine. (non disease causing)

S476P : Mutation of Serine Amino acid changed to

proline

SIFT : Sorting intolerant from tolerant

SNPs : Single nucleotide polymorphisms

SOD : superoxide dismutase

SST : Subscleral trabeculectomy

Taq : Thermos aquatiqus thermostable DNA

polymerase.

TBE : Trisborate EDTA

TM : Trabecular meshwork

tris-HCL : Buffer

V243V : Polymorphism with no amino acid change.

(non disease causing)

V432L : Polymorphism of valine amino acid

changed to leucine. (non disease causing)

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Introduction

laucoma refers to a group of disorders characterized by the death of retinal ganglion cells, optic nerve cupping, and visual field loss. This highly complex and multifactorial disease has multiple genetic and environmental influences (*Aboobakar and Allingham*, 2014).

In recent years, substantial progress has been made toward understanding the genetic basis of various forms of the disease. Gene-based screening tests are currently available for several early-onset forms of glaucoma (*Aboobakar and Allingham*, 2014).

Primary congenital glaucoma (PCG) is a severe form of glaucoma that presents early in life. PCG is a clinical and genetic entity that is distinct from juvenile forms of glaucoma. Despite its rarity, PCG and other forms of childhood glaucoma were once the leading cause of admission to schools for the blind in the United States in the first part of the 20th Century (*Abu-Amero et al.*, 2011).

PCG results from developmental abnormalities (trabeculodysgenesis) that affect the aqueous humor outflow pathway. These changes cause elevated intraocular pressure (IOP) and secondary glaucomatous optic nerve damage. (*Abu*-

Amero et al., 2011), and if left untreated, leads to irreversible blindness (Chakrabarti et al., 2010).

The incidence of PCG varies among geographic locations and ethnic communities, from 1:10,000– 20,000 in western countries, to 1:2,500 and 1:250 in inbred Slovakian Gypsy and Saudi Arabian populations, respectively (*Hilal et al.*, *2010*).

The link between PCG and gene abnormalities is the initial step in the establishment of the pathophysiology of the disease (*Badeeb et al.*, 2014).

Aim of the Work

To identify mutations in CYP1B1 gene in cases of primary congenital glaucoma, and its correlation to disease severity and surgical outcome (phenotype genotype correlation).