Figure	List of Figures
no.	
Figure 1	Homocysteine metabolism
Figure 2	Homocysteinylation of proteins at lysine and cysteine residues
Figure 3	Structure of CBS enzymes
Figure 4	- glutamate-cysteine synthetase
Figure 5	Glutathione synthesis
Figure 6	Fundus Image of Eales' disease
Figure 7	Fundus Image of Age related macular degeneration
Figure 8	OPA and β-mercaptoethanol react with an amino acids
Figure 9	HPLC chromatogram of standards using Fluorescence detector
Figure 10	HPLC calibration curve of standards using Fluorescence detector  HPLC calibration curve of standards using Fluorescence detector
Figure 11	HPLC calibration curve of standards using variable wavelength detector  HPLC chromatogram of HcyTL standards using variable wavelength detector
Figure 12	HPLC chromatogram of Ticy 12 standards using variable wavelength detector
Figure 13	Succinyl-CoA and Glycine react with ALAS
Figure 14	- 1 1 and be of AT AS by Spectrophotometer
Figure 15	the same of heme by Spectrophotometer
Figure 16	of ferritin by Specific Distriction
Figure 17	. Ctorein MV SDPCHODHOLOG
Figure 18	
Figure 19	C Magazilar Endomphial (HOWLH Lactor by operiophicionicis
Figure 20	
Figure 21	HPLC calibration curve of GSSG standards using Electrochemical detector  HPLC calibration curve of GSSG standards using Electrochemical detector
Figure 22	the of Y- glutamate cystelle by spectrophotometer
Figure 23	
Figure 24	
Figure 25	HPLC chromatogram of plasma samples of the
Figure 26	HPLC chromatogram of plasma samples of Attached The Bar diagram of plasma amino acids in controls versus ARMD  The Bar diagram of plasma amino acids in controls versus ARMD
Figure 27	The protein-Cys bound Hcy and protein 230
gu	compare to controls  The protein-Cys bound Hcy and protein-Lys bound Hcy in plasma of ARMD  The protein-Cys bound Hcy and protein-Lys bound Hcy in plasma of ARMD
Figure 28	The protein-Cys bound 1169 and sample compare to controls sample compare to controls iron and total iron binding capacity in serum
	They plot of liacillogicom,
Figure 29	The Box plot of hadrings.  sample of ED compare to controls.  Correlation between the Hcy, serum haemoglobin and serum total iron binding.
Figure 30	1 Lian between the 1277
r igure 30	c :
Figure 31	Box plot of ferritin, transferrin and serum transferrin receptor in serum sample of ED compare to controls. Correlation between serum ferritin and serum ED compare to controls.
	ED compare to communication of the conferring in ED and
72	transferrin.  Correlation between the plasma Hcy, serum ferritin and transferrin in ED and
Figure 32	control samples.
Figure 33	control samples.  Heme, ALAS and Heme oxygenase in serum sample of ED compare to controls.  Heme, ALAS and Heme oxygenase in the plasma Hey, serum Heme, ALAS, Heme oxygenase in
Figure 34	Correlation between the plasma 1797,
I Igui C J T	ED and control samples.
Figure 35	VEGE level in serum Samp
Figure 36	Correlation between the plasma Hcy, serum VEOT and Secum VEOT And
Figure 37	The mRNA expression neperant, reserve
	1 and HIF 2

Figure 38	The protein expression of hepcidin and ferroportin in ED compare to controls in PBMC normalized with $\beta$ - actin.
Figure 39	The protein expression of HIF 1 in ED compare to controls in PBMC normalized
Fi 10	with β-actin.  The Bar diagram of glutathione in controls versus ED.
Figure 40	Correlation between Plasma Hcy and Plasma GSH
Figure 41	Reduced and oxidized plasma glutathione in controls versus ED of plasma
Figure 42	12
Figure 43	The Bar diagram of -glutamate-cysteine ligase activity of serum samples in
l rigilitation	L L L L L L L L L L L L L L L L L L L
Figure 44	The Bar diagram of -glutamate-cysteine ligase activity of PBMC in controls versus ED
Figure 45	The mRNA expression levels of GCLC and GCLM in peripheral blood
l ''gare 43	1 11- in controls versus FI)
Figure 46	The mRNA expression of nuclear erythroid related factor 2 (NII2) in peripheral
l iguit is	l
Figure 47	The project of Cso. Glu. ADP and Mg ions with GCLC project
Figure 48	DAGD of the Cg atoms of GCLC-Cso and GCLC-Cys complexes
Figure 49	- Substrates in the complexes.
	my shortest distance between Cso and Cys residues with Giu residue
Figure 50	Largest distance between Cys with Glu residue
Figure 51	Lestwoon (SO With Cill residue.
Figure 52	The shortest distance between Cso with Grant Garden Grant Gr
Figure 53	
	various time frame.  Cytotoxic effect of Hcy and Cys on ARPE-19 cells
Figure 54	ot sakione content
Figure 55	the treated with Fick and Cys to Attail E 17 doing
Figure 56	
Figure 57	Homocysteine alters the amino acids level in the Development of the MRNA expression of GCLC and GCLM after Hcy exposure to ARPE-19
Figure 58	The mRNA expression of Godo and
	cells mRNA Expression of Nrf2 after Hcy exposure to ARPE-19 cells
Figure 59	mRNA Expression of the
Figure 60	Cytotoxic effect of Hcy on HUVECs  The mRNA expression of catalytic unit and modifier unit of GSH after Hcy
Figure 61	The mRNA expression of catalytic
	exposure to HUVECs mRNA Expression of Nrf2 after Hcy exposure to HUVECs
Figure 62	
Figure 63	mRNA Expression of Total  Dysregulation of Iron homeostasis in ED  Dysregulation of Iron homeostasis in ED
Figure 64	Altered GSH synthesis in ED
_	

• • • • •

Table.no	List of tables
Table 1	Comparison of techniques
Table 1	
Table 2	Drugs induced the Homocysteine metabolism and the mechanisms are listed
Table 3	Randomized clinical trials of therapy
Table 4	Demographic details of the patients based on the age and sex matched groups
Table 5	Patients and controls recruitment in the study
Table 6	Processing of Intermediate Standards of Homocysteine and its related amino acids
Table 7	Processing of working Standards of Homocysteine and its related amino acids
Table 8	Processing of plasma Samples for Homocysteine and its related amino acids
Table 9	Protocol for ALAS Standards
Table 10	Processing of ALAS in serum and peripheral blood mononuclear cells
Table 11	Processing of heme oxygenase in serum and Peripheral blood mononuclear cells
Table 12	The processing of samples for cDNA conversion
Table 13	The primer sequences for all the genes
Table 14	Processing of GSSG standards
Table 15	Processing of plasma Samples for GSH and GSSG ·
	Processing for GC in plasma samples and Peripheral blood mononuclear cells
Table 16	Comparative levels of plasma amino acids in controls versus ED
Table 17	Comparative levels of plasma amino acids in controls versus ARMD  Comparative levels of plasma amino acids in controls versus ARMD
Table 18	Comparative levels of plant  ELISA values of Homocysteine in controls versus retinal diseases (ED and ARMD)
Table 19	ELISA values of Homocystem  HcyTL values in control versus retinal diseases (ED and ARMD)
Table 20	HcyTL values in control versus remains a control versus ED serum sample  Levels of iron related parameter in controls versus ED serum sample
Table 21	Levels of iron related parameter in controls versus ED PBMC
Table 22	Levels of iron related parameter in controls versus ED PBMC  Levels of iron related parameter in controls versus ED of plasma samples
Table 23	Levels of from reduced and oxidized glutathione in controls versus ED of plasma samples  Levels of reduced and oxidized glutathione in controls versus ED of plasma samples
Table 24	Levels of reduced and Levels of -glutamate-cysteine ligase in serum and peripheral blood mononuclear cells in controls versus ED

## **LIST OF UNITS**

- Å Armstrong unit - dL Deciliter - g Grams - h Hour -L Liter - µL Micro liter **-** μg Micrograms - μM Micro molar -  $\mu$  moles Micro moles - mg Milligrams - mL Milliliter - mM Milli molar - m moles Milli moles - min Minute - ng Nanograms - nL Nano liter - nM Nano molar - n moles Nano moles - LU Relative fluorescence units - Sec

- U

Seconds

Unit

## LIST OF ABBREVIATIONS

Adenine dinucleotide phosphate - ADP Adenosine triphosphate - ATP Age related macular degeneration - ARMD American Type Culture Collection - ATCC Aminolevulinic acid synthase - ALAS Bovine serum albumin - BSA Cardiovascular disease - CVD Connective tissue growth factor - CTGF Coronary heart disease - CHD Cystathionine-β synthase – CBS Cysteine - Cys, C Diethyl pyro carbonate - DEPC Dithothreitol - DTT Dimethylsulphoximide - DMSO Dipotassium hydrogen phosphate - K2HPO4 Discrete optimized protein energy - DOPE Disodium hydrogen phosphate - Na<sub>2</sub> HPO<sub>4</sub> Dulbeecco's Modified Eagle Medium - DMEM Eales' disease - ED Electrochemical Detector - ECD Endothelial cell - EC Essential Growth Medium - EGM Essential Basal Medium - EBM Ethylenetetraminediacetic acid – EDTA Extracellular Matrix - ECM Fetal Bovine serum - FBS Fluorescence Detector - FLD □-glutamate-cysteine ligase – GCL □-glutamate-cysteine ligase catalytic unit - GCLC □-glutamate-cysteine ligase heavy chain – GCHS □-glutamate-cysteine ligase light chain – GCLS □-glutamate-cysteine ligase modifier unit – GCLM Glycine - Gly Glucose-6-phosphate - G-6-P Glucose-6-phosphate dehydrogenase - G6PD Glutamic acid - Glu Glutathione peroxidase - Gpx Glutathione - GSH Haemoglobin – Hb Heavy chain ferritin - HCF Heme oxygenase - HO High Performance Liquid Chromatography - HPLC Homocysteine - Hcy, cso, H Homocysteine-thiolactone – HcyTL Human Umbilical Vein Endothelial cells – HUVECs Human Vascular Smooth Muscle cells – HUVSMCs Hydrogen Peroxide - H<sub>2</sub>O<sub>2</sub>