

# Table of Contents

<b>Chapter 1 Introduction And Review of Literature</b>	<b>1-45</b>
1. Introduction	1
1.1 Female Infertility	1
1.2 Epidemiology/ Prevalence of female infertility	2
1.3 Classification of female infertility	6
1.4 Etiology of female infertility	6
1.5 Risk factors and causes of female infertility	7
1.6 Female infertility of endocrine origin	9
1.6.1 Thyroid disorders and female infertility .....	9
1.6.1.1 Thyroid disorders .....	10
1.6.1.1.1 Risk factors and causes of thyroid dysfunction .....	12
1.6.1.1.2 Hypothyroidism and female infertility.....	12
1.6.1.1.3 Subclinical hypothyroidism (SCH) and female infertility .....	14
1.6.1.1.4 Prevalence of SCH with female infertility in India .....	14
1.7 Autoimmune Thyroid Disease (AITD) and female infertility	15
1.8 SCH and alteration in female reproductive system	17
1.9 SCH, oxidative stress (OS) and female infertility	22
1.10 SCH, alteration in lipid profile and female infertility	23
1.11 Polychlorinated Biphenyls (PCBs) as cause of SCH leading to female infertility	25
1.12 SCH, Single Nucleotide Polymorphisms (SNPs) and female infertility	27
1.13 References	29
<b>Chapter 2 Aim and Hypothesis</b>	<b>46-55</b>
2.1 Aim of the study	47
2.2 Hypothesis of the study	47
2.3 References	51

<b>Objectives</b>	<b>53</b>
<b>Chapter 3 Screening of infertile female population for the prevalence of Subclinical Hypothyroidism, and to study the prevalence, involvement and the correlation of Autoimmune thyroid disease with Subclinical hypothyroidism in primarily infertile female population from Gujarat</b>	<b>56-99</b>
3.1 Introduction	57
3.2 Material and Methods	61
3.2.1 Ethical consideration.....	61
3.2.2 Study Population.....	61
3.2.3 Blood Collection and Serum Separation .....	62
3.2.4 Thyroid function test-TFT (Hormonal Estimation).....	63
3.2.5 Strategies for Screening and Management of IF-SCH.....	63
3.2.6 Confounding variables .....	64
3.2.8 Sampling method .....	65
3.3 Statistical analysis	65
3.4 Results	66
3.5 Discussion	79
<b>Chapter 4 Evaluating the effects of Subclinical hypothyroidism on the female reproductive hormones and to find out the prevalence of hyperprolactinemia, and to study the correlation of Subclinical hypothyroidism with altered reproductive hormonal profile in Gujarat infertile female population</b>	<b>100-135</b>
4.1 Introduction	101
4.2 Material and Methods	102
4.2.1 Ethical consideration.....	102
4.2.2 Study Population.....	102
4.2.3 Blood collection and sample preparation.....	103
4.2.4 Estimation of PRL and Reproductive hormones .....	103
4.2.5 Sampling method .....	103
4.4 Results	104
4.6 Discussion	120

4.7 Conclusions	126
4.8 References	127
<b>Chapter 5 To estimate and explore the effect of SCH on Oxidative stress levels and lipid profile, and to find out the correlation of SCH with the oxidative stress levels along with alterations in the lipid profile in primarily infertile female population of Gujarat</b>	<b>133-159</b>
5.1 Introduction	134
5.2 Materials and Methods	136
5.2.1 Ethical consideration.....	136
5.2.2 Study Population.....	136
5.2.3 Blood collection and sample preparation.....	136
5.3 Statistical analysis	138
5.4 Results	139
5.4.1 Oxidative stress biomarkers status	139
5.4.2. Lipid profile alterations in Control and IF-SCH subjects .....	144
5.5 Discussion	152
5.6 Conclusions	155
5.7 References	156
<b>Chapter 6 Estimating the levels of Polychlorinated Biphenyls and evaluating the correlation between PCBs toxicity and the cause of Subclinical hypothyroidism in Gujarat infertile female population</b>	<b>160-180</b>
6.1 Introduction	161
6.2 Material and Methods	164
6.2.1 Ethical consideration.....	164
6.2.2 Study Population.....	164
6.2.3 Blood collection and sample preparation.....	164
6.2.4 Gas chromatography.....	164
6.2.5 Body mass index (BMI).....	166
6.2.6 Lipid profile .....	166
6.2.7 Sampling method .....	166

6.3 Statistical analysis	166
6.4 Results	166
6.5 Discussion	168
6.6 Conclusion	174
6.7 References	174
<b>Chapter 7 To evaluate the prevalence and association of PDE8B polymorphisms with Subclinical hypothyroidism and female infertility And to study the possible genotype-phenotype correlation with the cause of SCH and infertility in Gujarat infertile female population</b>	<b>181-198</b>
7.1 Introduction	182
7.2 Material and Methods	184
7.2.1 Ethical consideration.....	184
7.2.2 Study Population.....	184
7.2.3 Blood collection and sample preparation.....	184
7.2.4 Genotyping <i>PDE8B</i> rs4704397 and rs6885099 polymorphisms .....	185
7.2.4.2 SNP rs6885099 in <i>PDE8B</i> gene.....	186
7.2.5. Sampling method .....	187
7.3 Statistical analysis	187
7.3.1 In-silico analysis .....	187
7.4 Results	188
7.4.1 <i>PDE8B</i> rs4704397 SNP in infertile females with subclinical hypothyroidism	188
7.4.2 <i>PDE8B</i> rs6885099 SNP in infertile females with subclinical hypothyroidism.....	190
7.4.3 Linkage disequilibrium and haplotype analysis .....	191
7.4.4 Genotype-phenotype correlation analysis .....	192
7.4.5 In-silico analysis .....	192
7.5 Discussion	192
7.6 Conclusion	195
7.7 References	195
<b>Chapter 8 Summary And Conclusions</b>	<b>199-205</b>

## **Appendix**

### ***List of Publications***

#### ***List of Oral/Poster Presentations***

#### ***Reprints of the Publications***

#### ***Ph.D. Thesis Synopsis***