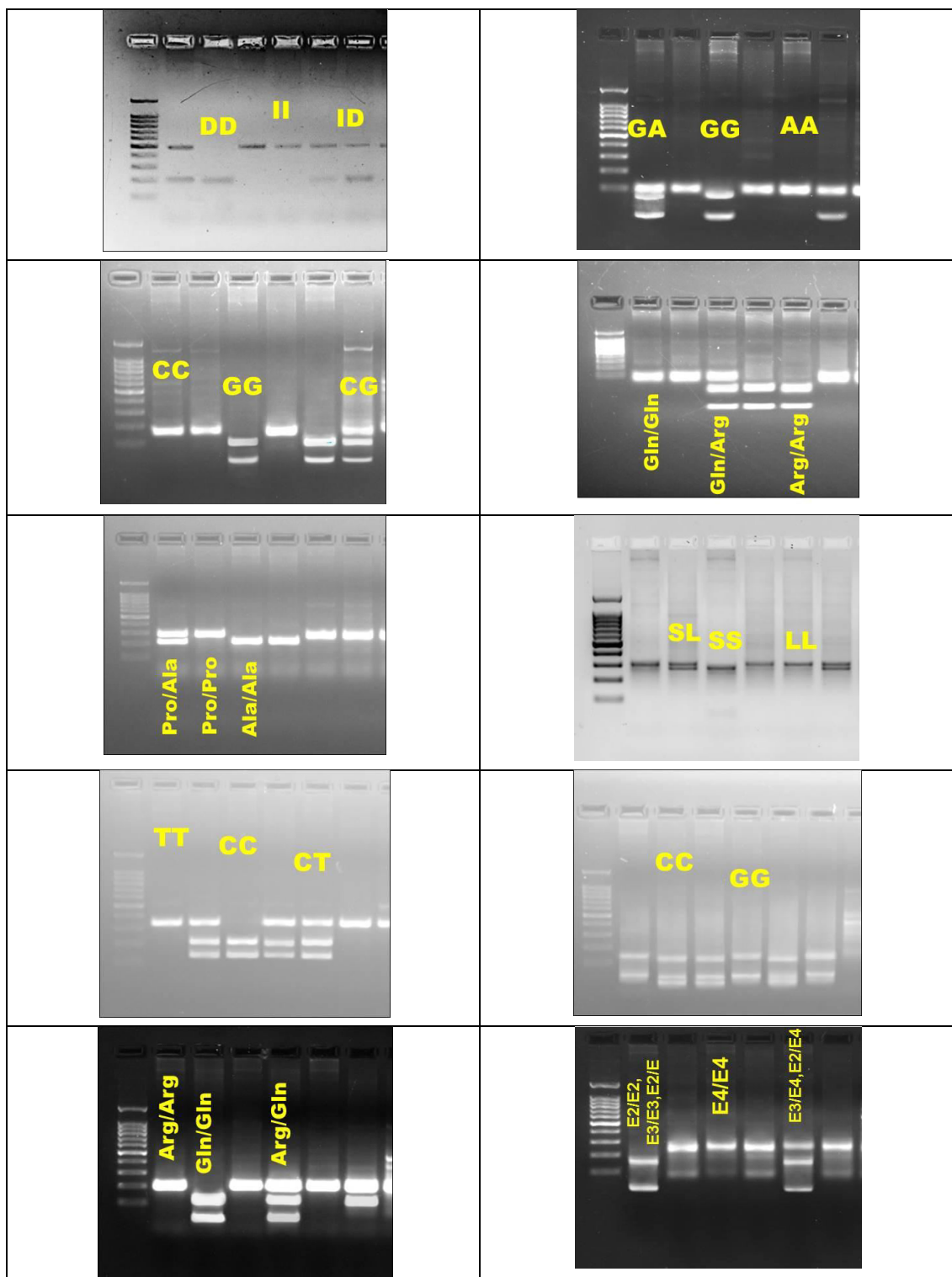


**Figure 5.7:** Gel image after PCR amplification using specific primers a) ACE showing 490 & 190 bp b)TNF  $\alpha$  showing 107 bp c) IL-6 showing 164 bp d)LEPR showing 80 bp e)PPAR showing 270 bp f)5HTT showing 267 & 300 bp g)5HTR2A showing 342 bp h)5HTR2C showing 184 bp i)ADRB showing 200 bp j)APOE showing 227 bp



**Figure 5.8: Gel image showing restriction fragment length polymorphism**

**ACE:** II: 490bp, ID: 490 & 190bp DD: 190bp **TNF  $\alpha$ :** AA: 107bp, GA: 107,87 & 20bp GG: 87 & 20bp  
**IL6:** CC: 164bp, CG: 164,87,62bp GG: 102,62bp **LEPR:** Gln/Gln:80bp, Gln/Arg: 80,57,23bp Arg/Arg: 57,23bp  
**PPAR:** Pro/Pro:270bp, Pro/Ala: 270,243,bp Arg/Arg: 243bp **5HTT:** LL: 300bp, SL: 300 & 267bp SS: 267bp  
**5HTR2A:** CC:216&126bp, CT: 342,216,126bp TT: 342bp **5HTR2C:** CC: 130,30,20bp, GG: 150,30bp  
**ADRB:** Arg/Arg:200bp, Arg/Gly: 200,145,55bp Gly/Gly: 145,55bp **APOE:**E4/E4:227bp, E2/E2,E3/E3,E2/E3: 177,50bp E3/E4, E2/E4: 227,177,50bp

## 6. Summary and Conclusion

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**6.1** Among the respiratory disorders, Obstructive Sleep Apnea is the most common disorder, the prevalence of which is increasing day by day. Various population based studies shows 14% of middle aged men in United States of America and 49% of middle aged men in Europe have clinically significant OSA. There is a strong association of OSA and obesity which indicates that the prevalence of OSA will continue to increase as global obesity is emerging as an epidemic. Obstructive sleep apnea can lead to a significant decrease in quality of life and functional capacity of an individual along with an increased risk of cardiovascular disease followed by death. Data obtained from various studies show that the presence and severity of OSA are associated with nocturnal hypoxemia along with an elevated chance of having diabetes and metabolic syndrome. Though OSA does not have a serious impact on the social life of an individual; it does lead to reduced economic productivity along with an increased risk for hypertension, coronary artery disease and stroke. The obstructive sleep apnea syndrome is characterized by episodes of partial or complete upper airway obstruction during sleep with airflow interruption or reduction leading to transient reduction in oxyhemoglobin saturation, hypercapnia followed by a transient awakening of the individual which leads to the reestablishment of the upper airway permeability (Casale, 2009). The apnea-hypopnea index is characterized by the number of apnea or hypopnea events which occurs during per hour of sleep and is used to categorise the severity of obstructive sleep apnea. The occurrence of such repetitive events contributes to fragmented sleep as a result of which the individual experiences excessive daytime sleepiness. According to the American Academy of Sleep Medicine the severity of OSA is determined based on the apnea hypopnea index (5 to 15 being mild, 15 to 30 being moderate and more than 30 being the severe) and by the degree of daytime drowsiness (AASM, 1999). The chapter 1 describes about the history, definition, epidemiology, pathophysiology and the various risk factors of obstructive sleep apnea.

**6.2 Chapter 2** narrates the aim and objectives of the study. The aim of the present study was to determine the prevalence of OSA and to determine its genetic association with specific primers in Polymerase Chain Reaction through a genome search. The objectives of the study are the determination of prevalence of OSA among the study population, determination of its prevalence using Epworth sleepiness scale and STOPBANG questionnaire

and investigation of the gender prevalence in OSA besides determination of the association of selected genes (ACE, TNF- $\alpha$ , IL-6, 5-HTR2A, 5-HTR2C, 5-HTT, LEPR, PPAR- $\gamma$ , ADRB, APOE) with obstructive sleep apnea.

**6.3 Chapter 3** gives elaborative information available in the published literature on OSA that includes methods of diagnosis and diagnostic criteria given by AASM. A brief explanation about the history and epidemiology has also been added in this chapter. The role of various genes in the development of OSA and their association with the disease is explained in detail.

**6.4 Chapter 4** deals with the determination of prevalence of OSA using the Epworth sleepiness scale and the STOP-Bang questionnaire. The descriptive statistics has been used to calculate the above from the collected data. The prevalence was found to be 13.7% by using Stop-bang questionnaire and 12.9% by using Epworth sleepiness scale. The McNemars test showed there was no difference in the diagnosis of OSA in both the questionnaires (Male : p value: 0.248 and Female : p value: 0.134). The ESS showed the OSA to be highest in the age of 70 and above (18.8%), followed by age group of 50-59 (17.7%). ESS for the age group 40-49 years was 13% and 11.4% for 40-49 years. It was least for the age group 60-69 years (10.8%). This might be due to less number of subjects in that age group. However there was no significant association of prevalence of OSA with the various age groups ( $p=0.44$ ). Gender-wise distribution of OSA based on the ESS was seen to be highest among males (14.2%) and females showed lesser (11.7%). However there was no statistical correlation of gender with prevalence of OSA ( $p=0.24$ ). As per STOP-Bang score, it was the highest in the age group 50-59 years (21.7%) followed by 40-49 years (15.8%). STOP-Bang score for the age group 18-29 years was 12% and for 30-39 years it was 12.6%. The same for the age group 70 and above was 12.5%. This might be due to less number of subjects in the latter group. Gender-wise distribution of OSA based on the STOP-Bang was seen to be highest among males (14.8%) and females showed 12.9%.

**6.5 In Chapter 5** the association of selected genes with OSA is explained. It was a prospective experimental study to evaluate the association of selected genes with OSA. The study group consisted of 100 participants (50 study group and 50 control, aged 25–40 years, with median age of 32.5 years). The cases were selected on the basis of sleep study data with an AHI of 15 or more to confirm the individuals with moderate to severe episode. The

individuals with history of cardiovascular disease, asthma and other medical histories were excluded from the study. Each participant from both the groups submitted a written informed consent and venous blood sample was collected for genetic testing. Isolation of DNA from the collected blood was performed using HiMedia DNA kit. The amplification of selected the genes were done using specific primers followed by RFLP to determine the association of various gene with OSA.

From the present study it is evident that the prevalence of OSA is increasing with time the cause may be attributed to the increase in obesity and sedentary life style of individuals. The study showed that there is an increase in the prevalence of OSA in case of females when compared to the published data. The prevalence of OSA was almost equal in both males and females. The genetic association study also revealed that males showed a significant difference in the association in genotype of LEPR gene whereas the females showed a significant difference in the association of the genotype of ACE as well as 5HTR2C gene. Hence it can be concluded that more number of genetic association study is required to include both the DNA and RNA expression and find out the exact genetic etiology of OSA. This will help in providing an early diagnosis of the disease.