CHAPTER-7
SUMMARY AND CONCLUSION

An orchestration of group of metabolic disorders like central obesity, insulin resistance, increased insulin level, impaired glucose homeostasis, dyslipidemia, raised blood pressure and low grade chronic inflammation is defined as metabolic syndrome. MetS increases the risk of onset of T2DM by five times and CVD risk by two times. Therefore cardiovascular diseases and diabetes mellitus are the well-established morbidities of metabolic syndrome. The prevalence and causes of CVD and T2DM mortality is still increasing in a dramatic way around the globe even though extensive effort for their prevention and treatment is being done. Obesity is claimed to be the main culprit for the cause of insulin resistance, hyperglycemia, atherogenic dyslipidemia, low grade chronic inflammation and hypertension which is combinely defined as metabolic syndrome. Increased level of glucose and hs-CRP, dyslipidemia, hypertension, and insulin resistance in patients with metabolic syndrome suggests that the patients are in increased risk of development of T2DM and CVD.

The study was commenced in the deptt. of Biochemistry in collaboration with deptt of Medicine, MMIMSR, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala. The study aimed at evaluating hs-CRP level and insulin resistance along with anthropometric measurements, glucose and lipid profile levels in MetS patients which, in turn, may suggest for the early diagnosis of MetS, better management, control or treatment of obesity, low grade chronic inflammation and insulin resistance in order to decrease the risk of T2DM and CVD.

In present study:

1. MetS patients have the average age of $50.50 \pm 29.01$ years which was insignificantly (p>0.05) higher than healthy control ($46.42 \pm 12.25$ years).
2. The mean weight of patients with MetS was $75.05 \pm 14.11$kg which was significantly (p<0.001) higher than healthy control ($63.76 \pm 8.26$kg).
3. Patients with MetS had significant (p<0.001) higher BMI (27.50 ± 4.9) as compared to the healthy control (22.93 ± 2.0) which shows the obesity as main culprit for development of MetS.

4. The mean SBP in MetS (143.77 ± 17.86 mmHg) was highly significant and higher than healthy controls (126.08 ± 6.2 mmHg).

5. The mean DBP in MetS (89.57 ± 11.46 mmHg) was highly significant and higher than healthy controls (80.76 ± 2.63 mmHg).

6. The fasting plasma glucose levels were 166.07 ± 85.42 mg/dl in patients with MetS while levels were 86.58 ± 7.84 mg/dl in healthy control. Thus, patients with MetS were having significantly (p<0.001) higher fasting plasma glucose levels than healthy control.

7. Plasma insulin levels in MetS patients (20.26 ± 11.47 µIU/ml) were also greater than healthy control (5.62 ± 1.72 µIU/ml) thereby indicating the presence of severe hyperinsulinemia in patients with MetS.

8. HOMA-IR in MetS patients (8.74 ± 7.96) was increased than healthy control (1.20 ± 0.38) significantly which showed the presence of subsequent insulin resistance in MetS.

9. In context of dyslipidemia MetS patients had elevated level of Triglycerides, Total Cholesterol, LDL-Cholesterol, and VLDL-Cholesterol as against healthy controls. Whereas HDL-Cholesterol levels were diminished significantly in MetS patients than healthy controls.

10. Significant higher level of hs-CRP (4.93 ± 1.45 µg/ml) was found as compared to healthy control (1.70 ± 0.61 µg/ml).

11. BMI and WC as the measure of obesity had a significant and positive correlation with BP, Insulin, HOMA-IR, TG, VLDL and hs-CRP.

12. SBP and DBP had significant and positive correlation with BMI, WC, Glucose, TC, LDL-Cholesterol and hs-CRP.

13. Hs-CRP was positively as well as significantly correlated with BMI, WC, Insulin, HOMA-IR, TG, TC and VLDL-Cholesterol.

14. HOMA-IR was significantly and positively correlated with BMI, WC, glucose, TG, VLDL-Cholesterol and hs-CRP.

15. The cut off value 2.55 µg/ml for hs-CRP was calculated for the prediction of metabolic syndrome using ROC curve.
16. The cut off value 2.50 for HOMA-IR was calculated for the prediction of metabolic syndrome using ROC curve.

In conclusion, diagnosing metabolic syndrome and assessing hs-CRP levels and HOMA-IR shows the status of inflammation and IR thereafter may guide in assessing the risk of development of T2DM and CVD in patients with metabolic syndrome. Appropriate measures can be implemented in such high risk subjects in order to protect them from development of T2DM and CVD. This also suggests for the development of novel drugs for alleviation of obesity, insulin resistance and low grade chronic inflammation.