Conclusion and Suggestions
Chapter 5

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Cardio and cerebrovascular diseases are multifactorial in etiology. Hence it is essential to diagnose the complications with multi markers. The data obtained from the present study and statistical analysis support the following conclusions (fulfilling the general and specific objectives of the study):

5.1. Conclusion

- The results of the present study suggest that the elevated level of serum concentration of hsCRP, serves as an apprehension or indicator of either chronic or acute inflammation and CVD. HsCRP may assist in identifying patients at high risk for a first cardiovascular event who might otherwise be missed by lipid screening alone. The data also suggest that the higher levels of hsCRP predict vascular risk even when lipid levels are normal or low. It may be useful for physicians to routinely check for elevated hsCRP levels in these populations for risk stratification. This prognostic information may aid in providing the appropriate levels and duration of close monitoring.

- The result shows that elevated levels of TC, TG, LDL cholesterol, non-HDL cholesterol and apo B promotes CVD, similarly, decreased levels of HDL cholesterol and apo A-I are associated with the development of CVD.

- With regard to lipid ratios, the data of the present study is consistent with prior reports that the ratio of TC to HDL cholesterol, LDL cholesterol to HDL cholesterol, non-HDL cholesterol to HDL cholesterol, TG to HDL cholesterol, apo B to apo A-I, and apo B to HDL cholesterol are strongly associated with incident cardiovascular events. The present studies do suggest that the use of either the ratio of TC to HDL cholesterol or LDL cholesterol to HDL cholesterol is superior to the use of TC or LDL cholesterol alone.

- The results of the present study support the hypothesis that uric acid is an independent risk factor in patients at high cardiovascular risk. In addition, the present study shows that uric acid has positive correlation with inflammation.
• Inflammation, as measured by hsCRP, and hyperlipidemia appear to play a key role in the development of cerebrovascular atherosclerosis and stroke, consistent with their well-known role in the pathophysiology of coronary atherosclerosis and CHD.

Though the lipid profile is a proven diagnostic marker in CVD and stroke risk cases, there are some differences with their levels in individuals. This leads to mismanagement. But hsCRP level seems to be a useful marker for vascular risk. This when combined with traditional risk factors, may to help improve better risk prediction.

• In patients with CVD and stroke, atorvastatin treatment significantly reduced inflammatory marker (hsCRP), independent to cholesterol reduction and also atorvastatin has fast and early anti-inflammatory effects similar to their lipid lowering effects.

• Treatment with atorvastatin significantly reduces the levels of TC, TG and LDL cholesterol in serum. In addition, atorvastatin significantly reduces non-HDL cholesterol and apo B levels, and produces variable increases in HDL cholesterol and in apo A-I. It was also found that the reductions in TC to HDL cholesterol, LDL cholesterol to HDL cholesterol, non-HDL cholesterol to HDL cholesterol, TG to HDL cholesterol, and apo B to apo A-I ratios with atorvastatin therapy. This suggests that atorvastatin mainly reduces the lipid fraction most available, rather than targeting only one lipid fraction. Improvement of abnormalities of lipid metabolism by atorvastatin might therefore prevent the progression of CVD and stroke.

• Atorvastatin significantly lowered serum uric acid levels. It is notable that uric acid reduction was independent of changes in lipidemic parameters.
• There were no significant difference between untreated and treated group in the levels of CPK, SGOT, SGPT, bilirubin, urea and creatinine. There was a negligible elevation of SGOT and SGPT observed in some patients in the test group following atorvastatin therapy and these elevations are not clinically significant.

Considered together, the present findings suggest that atorvastatin seems to be a more potential anti-atherosclerotic and anti-inflammatory agent in addition to its lipid lowering effect.
5.2. Suggestions

For those who are free of cardiovascular risk factors or clinical vascular disease, certain simple steps can always help, to prevent/reduce these risks:

- **Adopt a heart-healthy diet.** The one low in saturated fats and cholesterol. Use monosaturated or polyunsaturated fat.

- **Reduce weight if it is elevated.** It shall be an adding advantage if the weight is at loss.

- **Moderate your salt intake.** Most of them are not sensitive to salt and their blood pressure will not rise even if they take table salt and other forms of sodium in high quantity. Most of us take more salt than what is required. Many foods are naturally high in sodium and others have salt added in processing. Simple measures such as not adding salt to the food as it is cooked or at the table will reduce sodium intake to a reasonable amount. The salt restriction is absolutely safe and does not rob food of its taste, especially the herbs and spices are used as alternative flavorings.

- **Initiate a regular exercise program.** Significantly everyone can benefit from regular exercise. To be helpful, the program need not be too strenuous and can be adapted to an individual's preferences, schedule, and physical capabilities. Regular walking may be all that is necessary.

- **Stop smoking.** Nothing will be more advantageous.

- **Gain knowledge of stress-reduction techniques.** Avoid reacting to stressful circumstances in ways that will only serve to aggravate the problem.

- **Have your risk factor condition assessed on a regular basis.** A clean bill of health on one occasion does not assurance a lifetime of protection. Blood pressure, if normal today, should be checked every two years or so, and cholesterol, if normal, should be checked every five years.
"The availability of drug (viz, statins) and nondrug strategies (life style modifications) that could reduce cardio and cerebrovascular events provide hope that CVD and stroke can be minimized"