INTRODUCTION

Within physiological limits, the levels of basal serum cholesterol do not help in predicting an individual risk of developing atherosclerosis related complications like coronary artery disease (CAD). Over more than forty per cent of young patients of documented CAD do not reveal raised fasting cholesterol level (Gregory et al, 1983), yet they have rampant atherogenic vascular involvement. This indicates that importance of basal fasting cholesterol level in assessing risk for CAD has perhaps been over emphasised.

Zilversmit (1973) postulated that atherogenesis may be a postprandial phenomenon. Transient postprandial rise of beta VLDL, chylomicron and formation of several species of unusual lipoproteins, may cause repeated cholesterol deposition in cells in arterial wall over the years, while fasting cholesterol value may remain well within normal range over the same duration.

These facts clearly indicate that it is more important to study postprandial response of serum cholesterol and not merely the fasting levels. Considering these facts previous workers in our department (Arora and Mangal et al, 1988) tried to evolve a simple cholesterol tolerance test by single point feeding of high cholesterol fat diet (HCFD) and then observing
behaviour of changes in lipid lipoprotein profiles at first and third postprandial hour.

This test though simple has many flaws and limitations. Some of these are as follows:

1. Single dose HCPD given in the test consisted of 3 eggs plus 200 ml of milk (about 775 mg cholesterol and 20 gm fat). For formulation of a test it is important to use minimum amount of cholesterol fat diet stress that would produce significant changes (though magnitudes of such changes may be less). More so such large cholesterol load does not seem practical not acceptable to every one and probably useless.

2. Large segment of ever population is vegetarian so evolving a test based on egg diet is not justified. Cholesterol fat diet in some other form like crystalline cholesterol butter and milk or a combined formula diet should be used, which will be acceptable to all members of the community.

3. The proposed cholesterol fat tolerance test (CFT), takes into account only two postprandial samples — one at one hour and another at three hours. We do not know presently that what is the time gap after a HCPD, at which peak level is achieved and after what time these changes disappear. Thus choosing these two postprandial samples seems arbitrary, erratic and probably without a proper rationale.
4. Unlike glucose tolerance test, the response of serum cholesterol after feeding HCFD is not consistent, uniform and reproducible. The latter factor is of vital importance and if a test in an individual has not been shown to be reproducible, the validity of its importance is questionable.

5. There has been a diverse behaviour of changes in lipid profile after feeding HCFD in the said test. In about half of the cases there become a fall of serum total cholesterol (STC) and low density lipoprotein (LDL), after feeding HCFD but the remaining half show either a rise or no change. What should be considered a normal behaviour after feeding, remains unanswered.

6. Apart from fat and cholesterol, other dietary constituents protein and carbohydrate induced lipid lipoprotein changes should also be observed so as to make a comprehensive comparison between these changes.

The aim of this study is to correct different flaws and limitations of proposed single dose CPR by different clinical and pilot studies.

OBJECTS OF THE STUDY

1. To find out whether plasma lipoprotein changes induced by egg cholesterol can be duplicated by crystalline cholesterol and food substances other than egg cholesterol.
2. To determine the quantitative and qualitative spectrum of the change in plasma lipid profile which would include earliest change, peak change and plateau of plasma lipoprotein profile by studying serum lipid profiles in postprandial samples taken at different intervals.

3. To assess whether the results of single dose cholesterol tolerance test are reproducible and predictable.

4. To make comparison of single point cholesterol feeding with prolonged feeding (7-15 days) in same individuals.