Letter to the Editor

Lab medicine practitioners need to popularize the idea of Fasting is not routinely required for determination of a lipid profile: How practical the concept is?

SIR , - Non-fasting lipid testing has been nominated as the new standard for cardiovascular risk assessment in the span of a decade. Deranged lipid profile (hypercholesterolemia) has been the strongest modifiable risk factor for coronary heart disease and plasma lipid profile assay is now the integral part to assess the cardiovascular risk of a patient [1]. In this era of self-heath consciousness, It is common to consume several small meals during the day and snacks in between meals; therefore, the postprandial state predominates mostly over a 24 hr period. However , it is usual in common clinical practice to obtain a fasting blood sample 12 hours after overnight fasting for the lipid profile assay. This signifies an average daily plasma lipid and lipoprotein concentrations that may not predict the cardiovascular risk always [2] [3].

Large Population based studies conducted at Copenhagen and Calgary over the last decade suggested that serum lipid levels in a post meal condition show only minor variation with serum triglyceride levels showing an increase by about 20% while Low-density–lipoprotein cholesterol show a maximum of 10% lowering effect after taking full mill. This happens due to replacement of some cholesterol on LDL by the higher levels of triglycerides [4] [5]. Total cholesterol, high-density–lipoprotein (HDL) cholesterol and apo -lipoprotein B100, however do not show much change substantially after eating (Average postprandial changes were +0.3 mmol/L for TG, −0.2 mmol/L for TC, −0.1 mmol/L for HDL-C, and −0.2 mmol/L for LDL-C.).

Increasing trend of metabolic syndrome amongst the population in developing nations, there is rampant usage of statins / lipid lowering agents which also needed to be addressed for collecting lipid profile samples in non-fasting state. Three clinical trials related to use and effects of the statin drugs namely the Heart Protection Study, the lipid-lowering arm of the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT-LLA), and the Study of the Effectiveness of Additional Reductions in Cholesterol and Homocysteine (SEARCH) did not give any extra effect of statin therapy on non-fasting lipids levels in the blood [6] [7] [8]. However, a Chinese study has reported somewhat different observations that showed a significant difference between the fasting and fed state lipid parameters among the statin and non-statin group study population. The difference (%) [(non-fasting − fasting)/fasting ×100%] for all lipid variables amongst the population recruited for the study were TG 16.5% and 16.1%. ,−0.6% and −1.1% for TC, −3.9% and −2.1% for HDL-C, −4.8% and −2.9% for direct LDL-C, −5.4% and −5.3% for calculated LDL-C, and 14.8% and 12.0% for remnant cholesterol in the statin treated and non-statin groups, respectively. The data also pointed out that the differences between fasting and non-fasting lipid profile assays were not affected by types of statins or duration of usage [9].

As a matter of fact non fasting lipid profile assay can be popularized considering that it will simplify blood collection by phlebotomist who are often overburdened by the timeline provided to them for collecting fasting samples from patients home (most common service availed these days by population for regular health monitoring) . Also this will decrease the rush to the central laboratory in government run set ups in developing nations at fixed hours in the morning thereby easing collection schedule. Collection of samples from in house / IPD patients will also be eased with decrease of pre -analytical identification errors often caused during morning handover hour. Furthermore, the clinicians have also to take an extra effort and burden in advising for and getting a more accurate result for lipid profile at a later date that may be complicated by some additional phone calls, email ,or even a follow-up clinic visit ,thereby increasing workloads on the staffs.

However the other side of the coin may also be needed to think over. Non fasting lipid profile is not "universally acceptable" , as fasting lipid profile assay is a mandatory need in certain clinical conditions. The European consensus suggests that recommendation laboratories should perform re-measurement of fasting triglyceride levels preferably when non-fasting TG levels are ≥350 mg/dL, as triglyceride concentrations show a better stability in the fasting state. It is better to assess the fasting lipid parameters in convalescing patients of acute pancreatitis having hypertriglyceridemia or people with diagnosed hypertriglyceridemia (TG ≥200 mg/dL according to American Heart Association guidelines) during clinic follow-up. Moreover, due to possible effects of drug treatments in these patients, changes in non-fasting levels of triglyceride levels are possible due to which a fasting blood sample is mandatory in these patients for their lipid profile assay. If we look into the analytical part we may find the following issues :(i) as a conventional belief the fasting lipid profile is said to give more accurate results; (ii) lipid profiles performed in non fasting conditions are supposed to be invalid and calculation of LDL cholesterol levels using the Friedwald's formula is not supposed to be valid in fed condition conventionally;(iii) till now whatever reference values of lipid profile are available, most of them stand true for fasting state. Till now no validated reference range is available for assessment of lipid profile in non-fasting conditions.

Considering the above discussed facts lab medicine practitioners can think of popularizing the idea of non fasting lipid profile assay in patients excluding those who are under the fasting lipid profile follow up criteria. Considering the facts, it is more advisable to use total and HDL cholesterol values in evaluating cardiovascular risk as risk stratification using the Framingham risk score as these are not supposed to alter significantly with food intake. Clinicians also need to put more stress on non-HDL cholesterol for assessing non-fasting lipids, because this state changes the LDL cholesterol levels more than that of non-HDL cholesterol which in turn, possesses a greater predictive value than LDL cholesterol. Non fasting lipid testing will also yield a better compliance from the patient as they will remove the need for keeping themselves in fasting condition after waking up for a long time. This advantage will definitely reduce the turnaround time for the required test after it has been advised by the clinician as the patient can immediately turn up to the laboratory for the lipid profile test after it has been advised by the clinician. More importantly, it ameliorates the risks associated with fasting in diabetic patients, children and other vulnerable groups. It, furthermore, reduces the disadvantages associated with fasting in patients who are diabetic and also in children and other vulnerable population[10]. Also from the diagnostic industry logistic point of view it will be easier for phelebotomist preventing the unnecessary overburdened sample collection within stipulated timeline. The major advantage of non fasting lipid profile assay is no need for patients to fast for routine blood work. This is more evident when the glycated hemoglobin test is considered as one of the major exclusive tests for the diagnosis and monitoring of type 2 diabetes mellitus[11].
However, statins or lipid lowering drugs being used rampantly in the developing countries for overgrowing trend of metabolic syndrome , studies are further needed with larger population groups to comment on the effect of these medicines on non fasting samples . Also establishment of flagging criterias on the non fasting lipid parameters as well as seasoning patients / population regarding the non fasting lipid profile assay are the two lacunae that needs to be urgently addressed by the joint efforts of cardiologists and lab medicine practitioners .

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