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An assessment on pre analytical preparation of patients for fasting and post prandial blood glucose estimation

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Abstract

Proper preanalytical preparation of the patients in terms of hours of fasting, time of collection, type of food and also patients' compliance to the given instruction, is quintessential for fasting and post prandial blood glucose estimation. The present study is aimed to analyze the preanalytical preparation and patients' compliance for investigation of blood glucose. It is a cross sectional study and the study was done at the patients attending Chennai Medical College Hospital and Research Centre, Irungalur, Tiruchirappalli, Tamilnadu, India. A sample size of 100 adult patients, which includes 60 out patients (OP) and 40 in patients (IP) were taken for the present study. The present study results shows that 10 OP (16.6%) for fasting, 30 OP (50%) for post prandial and all the 40 IP (100%) patients for fasting and post prandial sample collections, were properly instructed. The results shows 10% IP and 20% OP patients are not adhering to given instructions. The study concludes adequate training is needed for the healthcare providers in giving preanalytical preparation instructions and patients' compliance for prudent report.

Keywords: Pre analytical preparation, Compliance, Fasting, Post Prandial, Glucose.

Introduction

Laboratory results serve as a cornerstone in today's evidence based medicine era. The laboratory results play a vital role in screening, diagnostic, prognostic and management of disease. The laboratory reports should be precise and accurate to have an effective intervention in patients care. Laboratory sciences nowadays have undergone a tremendous technologic improvement, but still laboratory errors occur. The laboratory errors can occur at any of the three phases of laboratory cycle-preanalytical, analytical and post analytical phase. The frequency of laboratory errors is more in preanalytical phase followed by analytical and post analytical phase.[1]

Suboptimal information about preanalytical preparation and lack of following the instructions by the patients will lead to erratic results and misinterpretation of results.[2],[3] The present study aims at assessing the preanalytical preparation from outpatients and inpatients for fasting and postprandial glucose estimation at Chennai Medical College Hospital and Research Centre, Trichy.

Materials and Methods

The present cross sectional study conducted at Chennai medical college hospital and research centre, Irungalur, Tiruchirappalli. A sample size of 100 adult patients, which includes male and female patients attending outpatient department 60 (OPD) and admitted as inpatients 40 (IP) were chosen for the present study. After the necessary instruction given regarding patient preanalytical preparation in terms of hours of fasting and type of meal (standard carbohydrate meal), sample was collected for fasting and postprandial blood glucose estimation. The questionnaire was prepared in such a way, which includes assessing whether the patient was well informed about the preparations of fasting, post prandial sample collection, and also

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checking whether the patients followed the instructions properly.

Questionnaire for Assessing preanalytical preparation and compliance of patients for blood glucose estimation

Patient Preanalytical Preparation instruction	**Patient status**	
Preparation for fasting sample (blood glucose, lipid profile)	***Informed (√/X)***	***Instructions followed(√/X)***
Time of previous day dinner, and the type of food consumed.		
Dietary advice regarding food stuffs to be avoided during the time of fasting-coffee, Tea, Fruit juices excepts sips of water.		
Reporting time for fasting sample collection. The time interval between dinner and morning fasting sample		
Preparation for post prandial estimation(blood glucose)		
Time and Type of food consumed		
Reporting time for sample collection after taking food for post prandial sample collection.		

Results

A total number of 100 subjects were enrolled for the present study. The total number of 100 subjects was segregated in to 60 OP and 40 IP. The data from the present study reveals that 10 OP (16.6%) for fasting and 30 OP (50%) for post prandial (figure 1) sample collections were properly instructed which includes hours of fasting, time of collection and type of food. Figure 1 showed among the 60 out patients 10 patients are properly instructed about the fasting preparations which includes hours of fasting, time of collection, restriction to alcohol and smoking and type of food and the remaining 50 are not instructed. Among the 60 out patients 30 out patients were properly instructed about post prandial preparation, which includes type of foods and time of collection. Rest of 30 out patients was not instructed about the post prandial preparations.

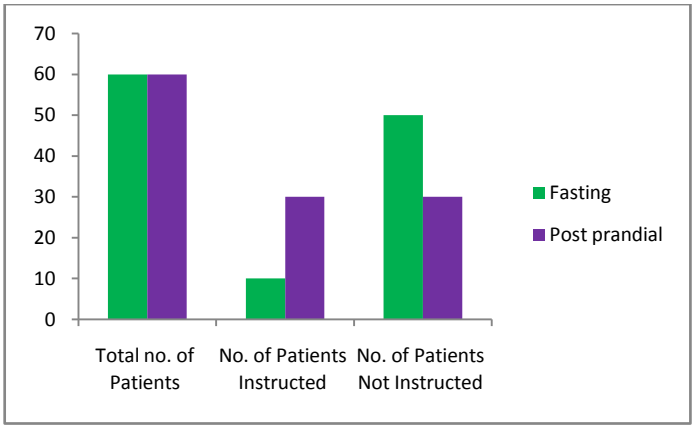

Figure 1: Out patients (OP) instructed for fasting and post prandial sample collections

Figure 2 shows that all the 40 IP (100%) were properly instructed about fasting and post prandial sample collection. Among those 40 IP cases 36 IP cases for fasting preparation were strictly followed the remaining 4 IP cases was not followed and all the 40 IP cases was strictly followed the post prandial preparation.

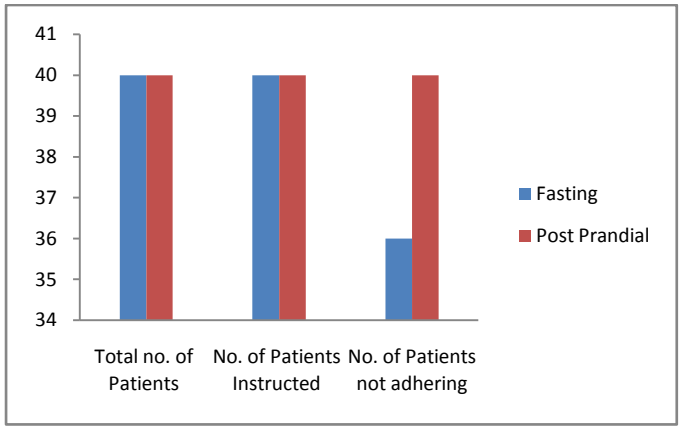

Figure 2: In patients (IP) instructed for fasting and post prandial sample collections

Figure 3 shows the number of patients not adhering to the preanalytical preparation instructions given by phlebotomists found to be 20% OP and 10% IP subjects. The present study shows that there was a lacuna in giving instruction and adhering to the instruction of fasting and postprandial glucose estimation among the patients undergoing blood glucose estimation.

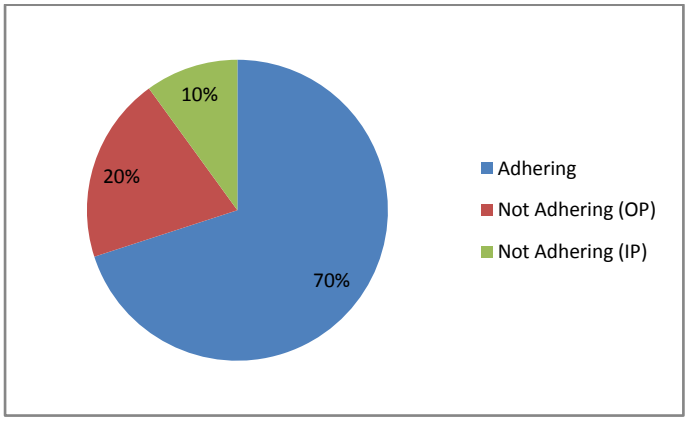

Figure 3: Out Patients and In Patients compliance for the preanalytical preparation instruction for fasting and post prandial sample collections

Discussion

Laboratory errors occur mainly in three phases preanalytical, analytical and post analytical. The preanalytical phase was handled by many personnel, the frequency of error much more common in preanalytical phase followed by analytical and post analytical phase. Inadequate instruction about preanalytical preparation and lack of following the instructions by the patients will lead to preanalytical error especially fasting and post prandial blood glucose results. This will have its consequence in wrong results and misinterpretation of the results. High degree of suspicion, proper case history about preanalytical preparation and adherence to instructions by patients will give a clue to find preanalytical error due to adequacy of preanalytical preparation and patients' compliance. But there are only few studies done on the preanalytical preparation and patients' compliance.[4] Previous studies showed that there is low level of adherence to preanalytical preparation instructions and follow up by the patients.[5]

The present study shows 10 OP (16.6%) patients are instructed about the fasting sample collection. The patients are directed from Outpatient department by physicians, interns, consultants, there could be lack of adequate time, lack of awareness of proper preanalytical preparation and negligence of the paramedical ward to give instructions by attended doctors. Regarding the post prandial glucose estimation 30 OP (50%) patients are instructed about the postprandial glucose collection. The increases in number when compared to fasting sample was attributed to the instructions gave by the phlebotomists, while collecting the fasting sample. But still 30(50%) patients are not given regarding the post prandial glucose collection.

Regarding the inpatients all 40(100%) patients are properly instructed about the fasting and postprandial blood glucose estimation. From the present study it was obvious that meticulous instructions are gave by the ward staff and interns to the in patients. This could be due to adequate time, vicinity and accessibility of the healthcare providers to patients.

Lack of awareness, adequate training could be the reasons for inadequacy of instructions and patients' compliance.[6] All the personnel involved in preanalytical phase have to be sensitized, aware and properly trained about the instructions to be given for fasting and postprandial sample collection.

It was found that the patients are not strictly adhering to standardized dietary plan, due to many reasons such as lack of proper instructions, unawareness of the impact of diet status on blood glucose results, negligence etc.[7] Also, patients are still unaware about the importance of adhering to standardized time schedule for fasting and postprandial intervals. This has to be taken into account both by phlebotomists and patients.[8],[9] Phlebotomists should have clear scientific knowledge about the influence of diet, time intervals on the blood glucose results, at the same time they should be competent enough to communicate and instruct the patient properly about sample collection.[10],[11] Patients also should strictly follow the instructions given by the phlebotomists. Collection procedure should be described in oral and paper form for better understanding of the process.[12]

The present study not included the effect of drug intake, physical activity in the blood glucose estimation; perhaps this is the limitation of the present study. Further studies are extended to relevant biochemical test requiring preanalytical preparation and adherence, which will estimate the importance of patients' compliance for preanalytical preparation. This will help us to frame a standard pattern of preanalytical preparation in terms of time interval, type of food, and drug intake, physical activity at the time of sample collection.

Conclusion

Proper training regarding preanalytical patient preparation on fasting/postprandial sampling should be given for the estimation of blood glucose to the ward staff, interns and other para medical personnel involved in preanalytical phase will ensure accuracy and reliability of laboratory test results. It has to be ensured that the patients also adhere to given instructions. Education and awareness about the preanalytical preparation on sample collection for Blood glucose estimation is the preferred way to avoid misinterpretation of test results.

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Authors Contributions

Senthil kumaran structured and organized the present study. Naveetha lakshmi has done the assessment among the patients. Sundhararajan was analyzed the results statistically. All authors read and approved the final manuscript.

Conflicts of interest: Authors have declared that no competing interests exist for the present study.

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