Research Article

A study of adequacy of completion of clinical biochemistry laboratory request forms

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Abstract

Background: Laboratory request forms are essential communication tool between the clinicians and laboratory personnel. In view of the meagerness of studies exploring request forms as a part of preanalytical errors, we planned to evaluate the request forms received at the clinical biochemistry laboratory. **Objective:** The aim of this study was to evaluate the adequacy of the details of laboratory request forms that had been submitted to biochemistry department. **Materials and Methods:** This lab audit was carried out at the clinical biochemistry laboratory of a tertiary care teaching hospital. The forms Laboratory request forms were segregated to evaluate the extent of completion of each form, completion of the columns, legibility of the clinician`s handwriting. The results were expressed in percentages. **Results:** A total of three thousand and fifty (3050) request forms were analyzed. The location of the patient and referring department were missing in 35.3% and 29.4% of the forms respectively. Provisional diagnosis was provided only in 53.3% of the request forms. **Conclusion:** This study concludes that the location of the patient, probable diagnosis, medical officer`s signature had not been entered in the request forms. As laboratory plays a crucial role in the patient diagnosis, incomplete data in the request form might significantly affects the lab service which in turn affects the patient's health care system. The standard of filling of laboratory request forms needs to improve to provide a high quality lab service.

Key words: Biochemistry, Lab Audit, Lab Service, Pre Analytical, Request Form

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Introduction

Laboratory testing, a really tangled procedure commonly called the total testing process (TTP)[1] is usually subdivided into three pre-analytical, analytical and post-analytical phases[2]. The commonest causes of pre-analytical errors (68.2%)[3] are inappropriate test request, incorrect order entry, patient/specimen misidentification, sample collected from infusion route, sample collected in inappropriate container, improper handling, mistakes in centrifugation (time and/or speed), aliquoting, pipetting, labeling, sorting , routing, storage and transportation[4]. The analytical errors (13.3%) are equipment malfunction, sample mix-ups, interference (endogenous or exogenous), undetected failure in quality control. The post-analytical errors (18.5)[3] are erroneous validation of analytical data, improper data entry and manual transcription error, failure in reporting/addressing the report, delay in reporting critical values, incorrect interpretation, inappropriate/inadequate follow-up plan. Clinical biochemistry laboratories have focused mainly on analytical phase of testing in terms of quality control methods and quality assessment programs. However evidence in recent times reveals that quality in clinical laboratories cannot be assured by pinpointing on exclusively analytical aspects of testing. Pre and post-analytical processes are necessary for providing quality laboratory services.

Evaluation of laboratory request forms is a pre-analytical audit [5]. Clinical audit has been defined as a

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quality improvement process that seeks to improve patient care and outcomes [6]. Laboratory-based clinical audits are involved mainly with the everyday aspects of laboratory services. Laboratory request forms are essential communication tools between the clinician and laboratory personnel. Request forms also serve as a document for medico legal cases and for health insurance purposes. Inadequate details on the laboratory request forms are of concern for the patients especially with serious ill conditions. All request forms received in the clinical biochemistry laboratory should contain the demographic data of the patient, location of the patient, hospital identification number (Inpatient/Outpatient number), date and time of sample collection, probable diagnosis, fasting status, ordering of tests, referring department, the name and signature of clinician. Insufficient data on laboratory request forms may delay communications with the requesting clinician, more so in patients with life threatening medical conditions. It is foremost that critical results have to be informed without any delay [7]. Many studies have focused the other aspects of pre analytical errors and only limited information is available regarding the evaluation of incomplete request forms in clinical biochemistry laboratory. In view of the paucity of studies examining preanalytical errors and to explore the ice berg of laboratory errors, we planned to evaluate the request forms received at the clinical biochemistry laboratory of a tertiary care teaching hospital.

Materials and Methods

Study Design: This lab audit was carried out at the clinical biochemistry laboratory of a tertiary care teaching hospital. It was a retrospective study conducted on all request forms submitted to the sample collection unit of the biochemistry laboratory to assess the completeness of filling of the forms. The requisition forms were scrutinized according to the entry of details of the requisition forms which includes patient`s name, age, gender, hospital identification number, referring department, location of the patient, date, fasting status, time of sample collection, ordering of laboratory tests, type of the tests (e.g. if urgent), clinical details or probable diagnosis, Illegible handwriting and clinician`s name and signature. We examined total of three thousand and fifty request forms received in biochemistry laboratory. The period of the study was from October to December 2014. Patient`s confidentiality was maintained. Patient`s names and hospital numbers were not entered on the data sheet for statistical analysis. Ethical approval was obtained from the Institutional ethical committee. The information provided on each request form was recorded in a Microsoft Excel spread sheet windows 7 and evaluated using software package used for statistical analysis (SPSS) version 21. (International Business Machines SPSS Statistics for Windows, Version 21.0. ARMONK, NY: IBM CORP) and results were interpreted as percentages.

Results

A total of three thousand and fifty request forms were included in the study.

Table-1: Completion and incompletion of request forms

Information Required	Completion rate (%)	Incomplete rate (%)	x2
Patient's Name	98.1	1.9	2.86
Age	98.1	1.9	2.86
Gender	98.3	1.7	2.84
Hospital Identification number(IP/OP number)	98.2	1.8	2.83
Referring department	70.6	29.4	5.17
Location of the patient	64.7	35.3	1.91
Date	90.7	9.3	2.02
Fasting status	78.8	21.2	1.00
Time of sample collection	18.1	81.9	1.16
Ordering of laboratory tests	97	3	2.72
Type of tests (If, urgent)	66.2	33.8	
Clinical details/probable diagnosis	53.3	46.7	13.64
Clinician`s signature	83.3	16.7	1.36
Clinician`s name	32.5	67.5	3.75

Table 1 shows the percentage of request forms that are filled with required information and percentage of request forms that are deficit in needed information.

Out of all the required information only the patient`s name, age, gender, and hospital identification number were present on 98% of the forms. The referring department and the location of the patient were absent in 29.4% and 35.3% of the request forms respectively. 90.7 % had entered the date properly on request forms. Fasting status for blood glucose and lipid profile had written in 78.8 % of the forms. Only 18.1% had entered the time of sample collection. 97% of the request forms had entered the ordering of the laboratory tests. 33.8% of the forms did have any information regarding the urgent tests. Column for provisional diagnosis was not filled in 46.7% of forms. Illegible handwriting was noted in 21.8 % of the forms. Only 32.5% of forms had names and signature and 83.3 % had only signature without the name of the clinicians.

Discussion

In this study, we evaluated the level of completion of laboratory request forms received in the clinical biochemistry laboratory. Nowadays, medical practice is highly hinging on reliable clinical laboratory services. Our study revealed that 98% of the request forms were filled with patient`s name, age and sex and this is consistent with studies of Burton and Stephenson [8]. Gender and age are imperative because the reference ranges are varying with age and sex. For example, TSH values vary for infants, children and adults and it is very important in therapeutic aspects. Age and gender are not stated on 25.6% and 32.7% request forms respectively in the studies of Edeghonghon Olayemi et al [5]. In our study, hospital identification number was missing in 1.8% of the forms. Identification of the patient is important as suggested in the studies of Muhammad Ashraf Sharif et al [9]. In some situations, different patients have the similar names; hence the information of IP/OP number is needed for identification of the samples and also helps for sorting out the results appropriately. Hence, effective measures yet to be identified and to be followed to reduce the identification errors as suggested by Makary MA et al [10]. Bar coding system is effective to reduce such type of identification errors. The referral department and location of the patient was missing in 70.6% and 64.7% of the forms respectively and is consistent with the studies of Nutt et al [11]. The absence of information regarding the location of the patient may delay the reporting of critical values to the concerned clinicians and the lab technicians had taken much time to search the patient's location for intimating the critical and urgent results as mentioned in the studies of Burton JL et al [8]. 90.7% had mentioned the date correctly and in many situations, sample collection time was not mentioned in 81.9 % of the forms. The time of the sample collection is paramount to analyze the turnaround time. Glucose estimation in serum samples might vary with time. For test like arterial blood gas analysis, misleading result could be obtained due to a prolonged time between collection and analysis. Fasting status is essential for blood glucose and lipid profile estimation. It has been provided in 78.8% of the request forms. If the test ordering is particularly urgent, marked them or special color coded labeling could be done. This might help the laboratory technicians to understand the emergency situation and to do the test immediately without any further extensive information. Clinical indication for a biochemical investigation might be mentioned, so that specimens will be prioritized. Provisional diagnosis and clinical details was provided only in 53.3% of the request forms and this consistent with the results of Nutt et al[11] and Nakleh et al[12]. In most of the instances, the perfect interpretation of result may depend upon the provisional diagnosis indicated on the request forms. Inadequate clinical details may force the lab technicians to repeat the tests twice to confirm the abnormal values. This definitely affects the turnaround time of the tests and consumes the valuable time of the technicians and laboratory medical officers. Diagnosis could not be able to read by the laboratory personnel because of illegible handwriting. Most clinicians (83.3%) had signed the request forms referred to the laboratory. However, only 32.5% indicated their names. It was observed that laboratories were experiencing significant problems with incompletely filled request forms. Incomplete request forms leads to a variety of issues like delay in result and initiation of therapy. Expanded expenditure also occurs when tests have to be repeated or duplicate reports are to be issued. Laboratory error may occur at any part of the laboratory process (Carraro P and Plebani M) [13]. Thus, regular auditing of the laboratory requests forms are mandatory to improve the health care system.

Conclusion

This study concludes that the provisional diagnosis, referring department and location of the patient was not entered in the most of the request forms. Medical officer`s signature was not clear and name of the clinicians were also lacking significantly. Although incomplete request forms come under pre-analytical error, it may lead to erroneous interpretative report and it also influence the quality of the post-analytical phase. Incomplete data provided to the laboratory could significantly impact the success and cost of overall treatment. In future, the completeness of the request forms issue should not be under estimated. The standard of filling of laboratory request forms needs to improve to provide a high quality lab service. Clinicians and future medical practioners which include postgraduates and interns should be adequately exposed to the routine procedure of the clinical laboratory. The limitation of this study is that the impingement of incorrectly completed request forms on analytical comments had not been determined and this study is limited to single center.

Suggestion: Electronic requesting practice is an excellent way of ordering the tests practice. Clinical biochemistry laboratory should be more closely involved in conducting regular audit programme and organizing continuing medical education programs for interns, junior residents, assistant professors to re-emphasize the importance of providing all relevant information in the request forms.

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