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Full Length Research Paper

Incomplete laboratory request forms as a contributory factor to preanalytical errors in a Nigerian teaching hospital

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That most laboratory errors occur in the preanalytical phase has been demonstrated in the past. There is paucity of data on the contribution of incomplete request forms to preanalytical errors in Nigerian hospitals. We examined our laboratory request forms for the frequency of incomplete data. Request forms received at the laboratory in a three- month period were examined for some parameters. The completeness of information supplied by the requesting physician was analyzed. A total of 2115 request forms were examined. The only well documented parameter was the patient's name. Time and date of specimen collection was recorded in 10.3 and 36.5% of forms respectively. Those who had their date of birth recorded were 86.4%. The working diagnosis was recorded in 93.2%. There was no information on medication on the entire patients. While the consultants' in-charge was stated in 96.6% of cases, fully written diagnoses occur only in 92.2% of forms. As laboratory data plays a significant role in medical diagnosis, incorrect or incomplete data provided to the laboratory could significantly impact on the comments and successful outcome of treatment that patient receives.

Key words: Request forms, result interpretation, preanalytical error.

INTRODUCTION

Clinical laboratories have long focused their attention on quality control (QC) methods and quality assessment programs in dealing with the analytical aspects of testing. However, a growing body of evidence accumulated recently showed that quality in clinical laboratories cannot be assumed by merely focusing on analytic aspects only. Pre and post-analytical processes are equally important for ensuring quality laboratory services. Process analysis has demonstrated that laboratory errors occur primarily in the preanalytic phase, influencing patient outcomes and cost (Bonini et al., 2002; Lippi et al., 2006). Insufficient data on laboratory request forms can make interpretative comments difficult and may delay communications with the requesting physician, more so in patients with life threatening medical conditions. Burnett et al. (2004), had shown in their study that 43% of request forms lacked complete information. Specific missing items of information included the physician's name or page number. Misidentification of patient and requested test were also frequently encountered. In our practice, there are no uniform pathology request forms. It is important that critical results are dispatched without delay. A critical result is a laboratory report suggesting that the patient is in imminent danger unless appropriate therapy is initiated promptly (Lundberg, 1972).

Laboratory procedure is a highly complex process and although laboratory services are relatively safe, they are not as safe as could be (Plebani, 2006). Errors occur within the whole testing process which can influence the quality of laboratory performance (Lippi et al., 2006a, b).

Incomplete laboratory requests forms are rarely rejected at the service point, in many instances the reception staff in the laboratory may not know the significance of the missing data. The main objective of this study is to highlight the absence of data including medications on the

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Table 1. Parameters on laboratory request forms n = 2115.

Item well documented	Number well written	Percentage (%)
Patient name	2115	100
Gender	2112	99.8
Ward / clinic name	2110	99.7
Illegible handwriting	2058	97.3
Consultant in-charge	2043	96.6
Hospital number	2021	95.6
Physician name	2023	95.7
Working diagnosis	1972	93.2
Diagnosis written	1949	92.2
Specimen type	1902	89.9
Date of birth	1827	86.4
Date of collection	771	36.5
Time of collection	218	10.3
Medication	0	0

patient's laboratory request forms as this may affect interpretation of test results.

MATERIALS AND METHODS

This was a retrospective study conducted at the department of chemical pathology of the Obafemi Awolowo University Teaching Hospital, Ile-Ife. The hospital is a 400 bed tertiary health centre serving a population of about 200,000 in south western Nigeria. It also receives samples from neighboring states. For the purpose of this study, we did not separate request on an in- or out- patient basis. In-patient phlebotomies were performed by the requesting clinician. We examined all forms received within a three month period, between April and June 2010 after the tests were completed. Emergency tests and hormonal assays were excluded. Requests for serum glucose with critical results were randomly selected (n = 150), to determine the impact of the absence of ward or physician information and result transmission. The laboratory personnel were directed to contact the requesting physician when results were above critical values, in keeping with good laboratory practice and to ensure patient safety.

Patient confidentiality was maintained, names and hospital numbers were not captured on the data sheet for analysis. Microsoft excel software was used for analysis. The study was approved by the ethics committee of the Obafemi Awolowo University Teaching Hospital.

RESULTS

A total of 2115 request forms were reviewed. The results obtained were as shown in Table 1.

Patient information

Whereas 2021 (95.6%) had identifying hospital number, the date of birth was given in only 1827 (86.4%) of patients. However all forms recorded patients names.

Clinician information

The consultant in charge was stated in 2043 (96.6%) and none had a telephone number or any contact information. The requesting physician detail was also recorded in 2023 (95.7%) of forms.

Clinical information

Working diagnosis was indicated in 1972 (93.2%) of forms but no remark about current therapy. While 2058 (97.3%) of all forms were legible, diagnosis was fully written in 1949 (92.2%) of forms.

Specimen information

The type of specimen was noted in 1902 (89.9%) of request forms. Whereas 771 (36.5%) recorded the date the sample was collected, only 218 (10.3%) did specify the time of sample collection.

DISCUSSION

Laboratory errors are of utmost importance, as laboratory data influences 70% of medical diagnosis and can significantly impact on the cost and outcome of patient treatment (Plebani, 2004). Laboratory request and test procedures are still largely manually processed making it prone to avoidable errors in this environment. A previous

study has shown that manually completed forms can lead to insufficient, incorrect or illegible data on request forms (Burnett et al., 2004).

Our report shows that no test request form included medication history and the provisional diagnosis were found to be incomplete on the request forms. In some instances, the correct interpretation of result may depend upon the provisional diagnosis indicated on the request forms, for example, approach to patient with abnormal serum glucose would be different in known diabetic and in treatment of naïve patients.

The use of abbreviated diagnosis was noted in this study. Clinician should be aware that non medical personnel may not be familiar with the meaning of the abbreviations, and valuable time is wasted in the process. In many instances, the time of specimen collection was not recorded. We need to have an idea of when samples were taken for analysis, a falsely low result could be recorded for bicarbonate and bilirubin due to a prolonged time between collection and analysis. The type of specimen obtained is important where bloody tap of other body fluid like pleural and cerebrovascular fluid may be confused with blood, resulting in the use of inappropriate reference range and therefore misleading result and interpretation.

Laboratory error has been defined as a defect occurring at any part of the laboratory process (Carraro and Plebani, 2007). If laboratory forms are improved upon, and made more user friendly, errors and inappropriate tests may be reduced (Bailey et al., 2005; Barth et al., 2001). The present request forms in use in this hospital has been in existence for more than 5 years, there is therefore the need to improve on it, to make it more informative and user friendly, for example, a space for telephone number of requesting physician should be conspicuous enough.

The observed frequency of legible handwriting in our study was 97.3%, this can be improved upon as Chawla and Mallika (2010), reported a legibility of 99.9%. Names and contact information of the attending consultant and requesting clinician were recorded in 95.7 and 96.6% respectively; this is a slight improvement on the report of Khoury et al. (1996), who stated that 17% of the requesting clinicians were wrongly identified. This challenge leads to a variety of problems like delay in result, institution of therapy, unclaimed reports and increased expense when tests have to be repeated or duplicate reports are issued. Of the 150 serum glucose requests with critical results of severe hyperglycaemia, the clinician could not be traced in 8 (5.3%) cases.

We found that only 86.4% of the patients had their date of birth documented, this is a big challenge for proper research and epidemiological studies, apart from the fact that there is association of clinical chemistry with different ages.

Laboratories are accustomed to receiving request form with inadequate clinical information (Fox et al., 1994), and the clinicians are also hardly informed about it. In particular, studies during the past 30 years have documented that clinicians ignore or overlook 25 to 60% of abnormal routine tests (Plebani, 2007). A more recent study demonstrated that a much smaller but still high percentage (3.5%) of abnormal results is not documented in the patient medical reports (Howanitz and Cembrowski, 2000). We believe there should be attitudinal change both ways in order for patients to benefit maximally from the health care services and we can start by correctly filing in laboratory form. Our result is likely to be representative of all public hospitals in Nigeria, since electronic requesting is not a usual practice as at today. The way to improve the quality of information received in the laboratory is still for the requesting physician to ensure that all columns are appropriately and diligently filled out.

In conclusion, this study demonstrated that processing incomplete laboratory request forms may lead to the misinterpretation of result and impair on adequate and meaningful comments from the laboratory. Although this study was limited to a teaching hospital, it is likely that the result would be similar for other teaching hospitals in the country since electronic system of request is not popular yet. Some ways to improve the quality of data provided with each request would be to ensure accuracy of information provided by way of auditing the request forms before it is presented to the laboratory.

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