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Evaluation of Laboratory Request forms Completion in a Tertiary Medical Laboratory of the Democratic Republic of Congo

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Abstract

Background: The inadequacy in the completeness of the Laboratory Request Form (LRF) has been reported as one of the major sources of errors during the pre-analytical step of laboratory analysis. To prevent the occurrence of such errors, this study aimed at assessing the level of completeness of LRFs. Methods: A retrospective analysis of laboratory request forms was conducted at the Clinical Biology Laboratory of the Kinshasa University Clinic, DR Congo, between November 2021 to May 2022. The LRFs were evaluated according to the completeness of all sections including administrative data of the patient, data of physician who ordered the test, relevant patient's clinical data and data of the biological sample. Results: From a total of 2842 LRFs evaluated, none was fully completed with all required information. Particularly, patient's clinical data including the medical history, provisional diagnosis and current treatment, were the most absent in 99% LRFs. However, two sections related to patient's ID and prescribed test were informed in 100% LRFs. Conclusion: The results of this preanalytical audit can serve as an improvement opportunity focused on strengthening awareness about complete filling of LRF.

Keywords

Audit, Laboratory Requisition Form, Clinical Biology Laboratory, Completeness

1. Introduction

The analytical process in the medical laboratory has three distinct phases: the pre-analytical phase, analytical phase and post-analytical phase. The pre-analytical phase involves the prescription of analysis by the physician and the collection of biological samples [1]. The analytical phase consists of testing of biological samples, while the post-analytical phase includes the validation and reporting of results [2].

The pre-analytical phase accounts for over half of the total testing process time in the laboratory [1] [3]. This step involves categories of medical personnel beyond laboratory staff, such as physicians [4].

Physicians use the Laboratory Request Form (LRF) to provide patient clinical and administrative data, prescribe laboratory tests and provide contact information. Laboratory physicians use this information to interpret test results accurately contributing to timely and effective patient management while preventing medical errors [5].

The pre-analytical phase is responsible for 46-85% of errors that may occur during the laboratory process [1] [6]. Incomplete LRFs have been identified as a major source of errors in this phase, leading to delayed treatment initiation due to late delivery of laboratory results [7].

However this inadequacy, can be easily corrected through evaluation, as required by the International Organization for Standardization (ISO) 15189, which sets quality and professional competence standards for medical analysis laboratory [8].

Despite the importance of this evaluation, it is rarely reported in the DR Congo.

This study aimed to assess the completeness of LRFs in a public tertiary laboratory in the DR Congo, within the context of the accreditation process.

2. Methods

2.1. Ethical Considerations

All data were collected anonymously and patient confidentiality was respected throughout the process. The research was approved by the Ethical Committee of the Public School of the University of Kinshasa (ESP/CE/107/2023).

2.2. Study Design

A retrospective analysis of laboratory request forms was conducted in the Laboratory of Clinical Biology at the Kinshasa University Hospitals, in the DR Congo.

The Laboratory of Clinical Biology consists of four technical units: the Unit of Reception, Sample Collection and Results Delivery; the Clinical Biochemistry Unit; the Cyto-Hematology and Hemostasis Unit; the Immuno-Hematology and Blood Transfusion Unit.

The study included all LRFs received in the Reception Unit during routine service, from November 1, 2021 to May 25, 2022. All LRFs used were in printed paper format. Blood transfusion prescriptions were excluded from the study.

The LRFs were evaluated based on the completeness of all sections including patient data (names, age or date of birth, gender, rate category, ID, Service or

Department); data of the physician who ordered the test (names, ID, signature and phone number); clinical data (relevant clinical information, presumptive diagnosis, current treatment); and data related to biological samples (type of biological sample, tests prescribed, date of the prescription of analysis).

2.3. Data Analysis

Data related to each section of the LRF were collected in an Excel sheet with each parameter evaluated as either yes or no, corresponding to the presence or absence of information.

A LRF was considered fully completed if all required information was present in all sections. An LRF was deemed incomplete or partially completed if at least one information was missing in a section.

The completeness frequencies were evaluated using SPSS (IBM Statistics, USA) software version 21.

3. Results

A total of 2842 LRFs were assessed for completeness during the study period. None of the LRFs were fully completed; there was at least one or more missing information in some sections. However, when considered separately, some sections were fully or partially completed (see Table 1).

The parameters most frequently completed at a frequency between 70 and 100% are shown in Figure 1.

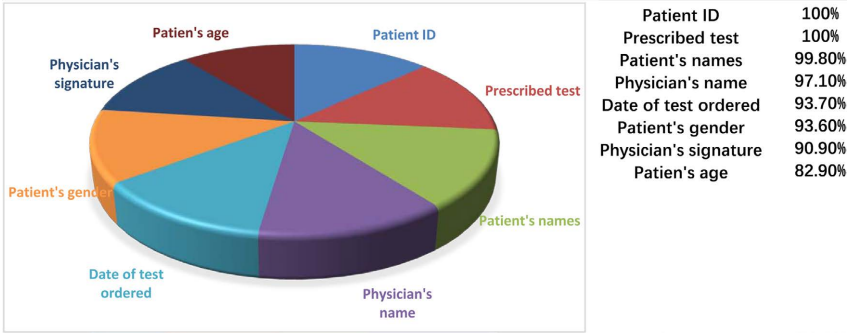

Figure 1. The most commonly completed parameters.

Table 1. Frequency of LRFs completeness.

Sections		Presence N (%)	Absence N (%)
Patient data	Name (Surname)	2835 (99.8%)	7 (0.2%)
	Second name	1319 (46.4%)	1523 (53.6%)
	Age	2358 (82.9%)	484 (17.1%)
	Gender	2660 (93.6%)	182 (6.4%)
	Department /Service	1893 (66.6%)	949 (33.4%)
	ID	2842 (100%)	0

Continued

Physician data	Name (Surname)	2761 (97.1%)	81 (2.9%)
	Second name	111 (3.9%)	2731(96.1%)
	Physician record ID	250 (8.8%)	2592 (91.2%)
	Signature	2583 (90.9%)	259 (9.1%)
	Phone number	4 (0.1%)	2838(99.9%)
Patient clinical data	Medical history	40 (1.4%)	2802 (98.6%)
	Provisional diagnostic	7 (0.2%)	2835 (99.8%)
	Current treatment	1 (0.03%)	2841 (99.9%)
Biological sample data	Type of biological sample	356 (12.5%)	2486 (87.5%)
	Prescribed test	2842 (100%)	0
	Date of test ordered	2664 (93.7%)	178 (6.3%)

The patient's clinical data including medical history, provisional diagnosis and current treatment, were the least completed sections, being absent in around 99% of LRFs. (**Table 1**)

4. Discussion

This study assessed the level of completeness of 2842 LRFs in a public tertiary laboratory in the DR Congo, and reported that none were fully completed with all required information. Specifically, patient's clinical data were the most absent in 99% of LRFs. However, two sections related to patient's ID and prescribed test were informed in 100% of LRFs.

While complete filling of LRFs is rarely reported in the literature, some studies noted a level of completeness higher than 70% [9] [10]. However, many studies, including ours, reported very low frequencies of full-filled LRFs: 1% in Kenya [11], 1.3 % in Nigeria [12] and 12.2% in India [13]. Probably the format of LRFs, electronic or paper, could be an influential factor in the completion level.

The rate of completeness according to each section of the LRF was quite different depending on the study. Concerning the patient's name, this study and many others noted a high rate of completeness close to 100% [7] [9] [10] [12] [13] [14] [15] [16]. Indeed, the name is the first parameter to be filled in many LRFs, and usually nameless LRFs are rejected [10].

Our result on patient's age is comparable to the frequency reported by Oyedeji *et al.* in Nigeria (98 %) [12]; but higher than what was observed by Oyelekan *et al.* in Nigeria (42%) [7] as well as by Kiani *et al.* in Pakistan (9%) [17]. Sometimes, several clinicians mentioned "Adults" or "Infants" on the LRF instead of the real age. This could explain the difference observed in the frequency. The limited intellectual level of some patients, who do not know their date of birth or even their age, is also a factor to be considered [18]. Anyway,

the most accurate information recommended is the date of birth instead of age [8]. Patient's age is among the major parameters to be considered for the validation of testing results. For many biological parameters, the reference ranges vary according to patient's age. Additionally, the patient's age is an important guiding element for epidemiological research as some diseases are more frequent in certain age groups than others.

In our study, the patient's Service or Department was provided in 66% of LRFs only, similar to that obtained by Oladeinde *et al.* in Nigeria (51%) [18] and Olayemi *et al.* in Ghana (67%) [19]. The absence of this information may result in delayed transmission of patient results from the laboratory, particularly in emergency situations [18].

The name of the physician was among the most completed data in our study (93%), in agreement with the proportions reported by Oyelekan *et al.* in Nigeria (93%) [7], Kipkulei *et al.* in Kenya (96%) [11], Jegede *et al.* in Nigeria (93%) [9]. The identity of the physician is important because it allows quick communication of results especially if they are critical. This identity associated with the phone number or email address of the physician allows the laboratory staff to collect missing information on the LRF, clarify provided information or advise on possible further exams for better patient management.

The medical history of patients as well as the provisional diagnosis and current treatment were the most absent information, in 99% of LRFs. This low frequency of completeness in these parameters has also been reported in other studies [17] [18] [20] [21].

Several studies have shown that the absence of clinical information, including presumptive diagnosis, often leads to unnecessary additional tests, increasing the financial burden on patients and their families [18] [19].

The nature of the biological sample was also less documented (12.5%) in this study, contrasting with the proportion of more than 90% reported by Adegoke [21]. In our hospital, physicians mention the nature of the biological sample on the collection tube instead of on the LRF which could explain the low frequency observed in our study. Nevertheless, the type of sample remains important in the LRF.

Limitations and Strengths of the Study

This study was unable to describe the effect of the incompleteness of LRFs on laboratory turnaround time, results interpretation, and clinical service delivery.

However, this limitation does not affect the results and the impact of the knowledge it brings to the fore on the need for better completion of LRFs. This study is the first, in the local context, to highlight key points partially or totally not completed in the LRFs.

5. Conclusion

The incompleteness of LRF reported in this study can be seen as baseline data. Therefore it is necessary to implement corrective measures as required by the

quality management system in the medical laboratory. Improving communication between physicians and laboratory staff is one of the corrective measures to be considered.

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All the data were collected anonymously and patient confidentiality was respected during the process. The research was approved by the Ethical Committee of Public School of the University of Kinshasa (ESP/CE/107/2023).

Conflicts of Interest

The authors declare no conflict of interest.

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