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Clinical audit of computed tomography requisition form in a Himalayan country, Nepal

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Abstract

Introduction: Medical imaging requisition form is a vital document in the radiology department. Adequate filling ensures justification and effective communication which impacts patient care. This study aims to audit computed tomography (CT) requisition forms to determine their adequate filling and legibility in the Himalayan country, Nepal.

Methods: A total of 239 CT requisition forms were collected from the Department of Radiology and Imaging, Bir Hospital, Kathmandu, Nepal through random sampling from June to August 2020. The availability of information such as demographic characteristics, clinical history, clinical diagnosis, differential diagnosis, and proper name of CT procedures was audited. The legibility of the provided information was categorized with the help of a senior radiographer having 10 years of experience.

Results: Clinical history was present in 28 percent and clinical diagnosis in 64 percent of forms. Furthermore, 44 percent of contrast-enhanced procedures requiring IV contrast agents did not have a report of renal function test. Surprisingly, details on the last menstrual period for women of the reproductive age group were missing in all requisition forms.

Conclusion: Available information is not sufficient for justification of patient dose. Clinicians need to fill up the requisition form properly for quality patient care in the radiology department.

Introduction

The evolution of computed tomography (CT) has been an important diagnostic tool in modern medicine [1]. The application of CT for diagnosis in symptomatic as well as the screening of asymptomatic patients has dramatically increased [1]. With the increasing use of CT, there is an increased risk of cancer and stochastic effects [8]. Therefore, the use of CT scans in medicine must be justified and optimized [9]. In Nepal, the use of paper-based requisition forms is routine and mainstream mean of communication between the referring physician and the imaging department for CT imaging procedures, mainly in tertiary hospitals. Digital referral system for imaging procedures is not available because electronic health records is still not available in tertiary hospitals of Nepal. To request for any CT imaging procedures a physician makes use of available CT requisition form which has adequate space to provide all the information. These requisition forms are manually handwritten and is signed by referring physician to validate them. It is the professional responsibility of referring physician to fill them adequately and provide the necessary clinical information of the patient [2]. Regarding the format of CT requisition form, the standard format does not exists, so there is the significant variation on the format among the institutions [3].

Inadequately filled requisition forms have been reported on similar audits carried in Nepal and in other countries [4–7]. Inadequately filled forms are prone to misleading communication that may lead to unnecessary scans and delays in the final report provided by the radiologist. It is ethical responsibility of radiographer and radiologist to carry exposure only on justified procedures that involves ionizing radiation[10]. International Atomic Energy Agency (IAEA) and the European Society Of Radiology (ESR) recommends auditing all services and process of investigation that involves ionizing radiation as these activities helps to improve and maintain the quality of patient care [9].

In this study, we aim to audit the computed tomography requisition form in a national hospital in Nepal. This study will help to know the current practice of filling out a CT requisition form by a referring physician.

Methods

Study Design

A cross-section retrospective study was carried out at the Department of Radiology and Imaging, Bir Hospital, National Academy of Medical Sciences (NAMS), Kathmandu, Nepal. CT requisition forms were collected from June to August 2020 from the CT scan room.

Data Collection

Generally, in a day around 30 CT imaging procedures combining both non contrast and contrast study are carried out. On average 1000 CT imaging are carried out in a month. Patients from outpatient and inpatient department usually have their CT appointment time

except from the emergency department. In this audit CT requisition forms from inpatient and outpatient department were included whereas requisition forms from emergency department, other hospital and clinics were excluded from the audit. After the CT Imaging procedure is completed, it is the usual practice to keep CT requisition form in the department for reporting. On average, 8 -10 CT requisition form were collected by random sampling and audited in a day. A Performa was prepared and available information was given number "1", missing information was given number "0" and those not requiring information on certain category such as last menstrual period in male patient, history of allergy and renal function test in non-contrast CT were left blank. Demographic details particularly the full name, age, sex, date of examination, referring unit, category of examination, clinical history, clinical diagnosis, provisional diagnosis, previous history of surgery, Last menstrual period (LMP) of female of reproductive age group (15-49), history of allergy, renal function test report for contrast-enhanced procedures and name and signature of referring physician were thoroughly checked and collected. The handwriting was categorized as legible and illegible with the help of radiographers on duty. Radiographers on duty helped in categorizing of the handwriting in case of difficulties. It was categorized as legible when all words were clear, and even if some were words unclear but the meaning can be understood whereas categorized as illegible if most words were unclear with the meaning of the whole word unclear, and when all words were impossible to identify.

Data Analysis

Microsoft office excel worksheet was used to record the data. Descriptive statistics and exploratory analysis were used to analyze the data using Statistical Package for Social Sciences (SPSS) 20, IBM, Chicago, United States.

Ethical Consideration

A letter of approval was obtained from the institutional review board (IRB) of NAMS, Kathmandu, Nepal.

Results

A total of 239 CT requisition forms were collected and audited. Table 1 shows the complete audit of the CT requisition form. Name, age, and sex were the most filled variables. The date of examination was present in 77% of the audited forms. The category of examination was present in 15%. Likewise, clinical diagnosis was present in 64%, provisional diagnosis in 43%, and clinical history in 30%. Figure 1 shows the number of different clinical information available and unavailable among the audited CT requisition form.

Renal function test was present in 55% of forms requested for contrast-enhanced CT. History of allergy, LMP, and previous history of surgery was missing in all forms. The signatures were present in 70% whereas the name of referring physician was present in 15%. The handwritings were legible in 93% whereas 7% had illegible handwritings.

Table 1
Study variables and their audit information

Variables	Present	Absent
Full Name	100%	0%
Age	100%	0%
Sex	100%	0%
Date of Examination	77%	23%
Referring Unit	23%	77%
Examination Category	15%	85%
Clinical History	30%	70%
Clinical Diagnosis	64%	36%
Provisional Diagnosis	43%	57%
Last Menstrual Period	0%	100%
Renal Function Test for Contrast Enhanced CT	55%	45%
History of Allergy	0%	100%
Name of Referring Clinician	15%	85%
Signature Of Referring Clinician	70%	30%
Previous History of Surgery	0%	100%

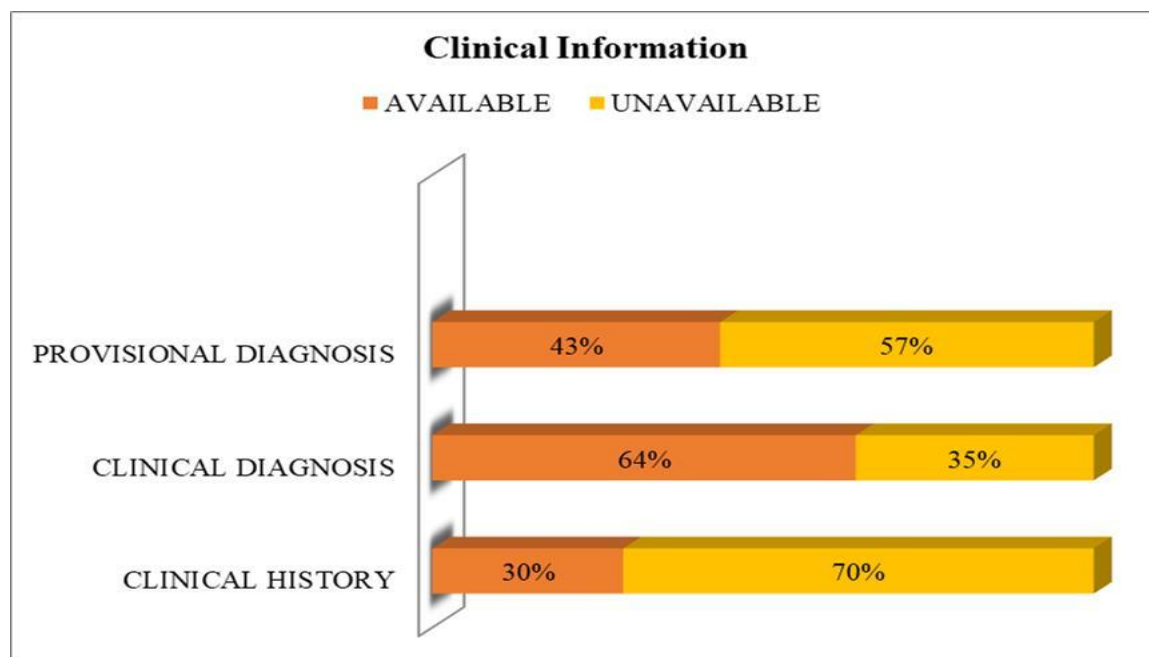


Figure 1. Percentage of clinical history, clinical diagnosis, and provisional diagnosis among the audited CT requisition form.

Discussion

CT requisition form is an important document for communication between referring physicians, radiographers, and radiologists. It must be adequately filled to justify the requested imaging procedure and provide quality care to the patient. Even though filling requisition form is extremely important, it is undervalued by the referring physician. In general, in this audit, we found that demographic details were adequately filled but the clinical information was missing in most CT requisition forms.

Clinical information such as clinical history, clinical diagnosis, and provisional diagnosis is necessary to justify the requested examination. A similar audit carried out by Koirala A and Bhandari S in a tertiary hospital in Nepal also found that none of the radiological requisition forms were adequately filled as missing clinical information was the most common finding [4]. Similarly, LMP must be noted for a female of the reproductive age group (15-49) before requesting any imaging procedures that involve ionizing radiation to prevent accidental exposure to embryo [12]. Audit, use of checklists, and effective communication are among the recommended activities to prevent accidental exposure [12]. None of our forms have information on the last menstrual period which is similar in finding to the audit carried out by Zafar et al. [7]. This might be due to the limited knowledge about the guidelines for referring radiological imaging procedures and radiation protection among physicians [11].

There is always an allergic risk associated with the use of contrast agents, therefore proper preparation is necessary for those having a history of allergy. The referring physician should be aware of the previous history of allergy. However, in this study, the history of allergy was missing in all CT requisition forms which is similar to the findings of the study conducted by Zafar et al. [7]. The history of previous surgery holds great significance as it might have changed the anatomical structures. This information is crucial for reporting CT images. However, none of our requisition forms have information on the previous history of surgery. These information remained neglected by physicians when referring patients for CT imaging.

Finally, requisition forms must be signed by the referring physician, and the name of the physician must be available to validate the requisition. In our audit, only 15% of requisition forms have the name of referring physician and 70% have a signature on them. A similar audit found 30% have the name of the physician and 100% had a signature [3]. This information is necessary because on any urgency or need of extra clinical information radiographers and radiologists could contact the referring physician.

There could be plenty of reasons for these inadequately filled forms. First, might be due to the lack of a standard referral guideline. Second, could be because of inadequate knowledge of radiation protection among referring physicians [11]. Third, there is no radiation regulatory body for healthcare in Nepal [13–15]. Hence, there is a necessity to standardize the CT requisition form and develop referral guidelines. Educational workshops and seminars need to be organized in a timely fashion that can inform physicians about the

importance of providing adequate information in requisition form. Similarly, the establishment of a radiation regulatory body could improve the way radiation is used in medical imaging in Nepal.

A major limitation of this study was that it was carried out for a short duration of time and the number of samples was small.

Conclusion

CT requisition forms is found to be inadequately filled by referring physician in the Nepalese hospitals. Insufficient information in radiologic requisition forms is detrimental to the care and safety of the patient. Adequate awareness about the exchange of information between the prescriber and the radiology department is necessary to ensure adequate communication and enhance patient safety and readily service from radiology department.

Statements and Declarations

This work will be presented at the 22nd International Conference of Radiographers and Radiologic Technologists (ISRRT) World Congress 2022.

Competing Interest: All authors declare that there are no conflicts of interest.

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