Original Article

Obstetric ultrasound requests: An audit at a Nigerian tertiary hospital

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Abstract

Background/Aim: Radiology request forms (RRFs) are the essential communication tools between clinicians and radiologists. They should be filled out completely and legibly to prevent misunderstanding of the requested investigation. This study aims to audit the adequacy of filling of RRFs for obstetric ultrasound at University of Nigeria Teaching Hospital Enugu.

Materials and Methods: One thousand one hundred and sixty obstetric ultrasound request forms sent to the radiology department of a tertiary institution from January 2019 to December 2023 were evaluated. There were 16 fields: Date of request, name, age, patient's contact, clinical diagnosis, clinical details, parity, LMP, EDD, gestational age (GA), information required, previous exam, doctor's signature, consultant's name/firm, patient mobility, and legibility of writing. The adequacy and completeness of filling of these individual fields were assessed. Descriptive data analysis was carried out.

Results: Age ranged from 17 to 52 years (mean 31.9 years). The most filled field was the patient's name 100%, and date of request, 99%. In contrast, 28.7% of patient's age, 80% of contacts, 7.8% of clinical diagnosis, 60.1% of clinical details, 30.3% of parity, 26.3% of LMP, 37.8% of EDD, 35.3% of GA, 2.6% of information required, 96.6% of previous examination field, 21.6% of doctor's signature, 20.3% of consultant's name/firm, 97% of mobility of patient were unfilled. 8.2% had illegible writing. A total of 34.5% of fields were unfilled.

Conclusion: Radiologists are often not provided with adequate information to make a diagnosis. This study creates the awareness of the importance of properly filling request forms, which will help improve the quality of radiology reports and patient care.

Keywords: Obstetric, radiology, report, request forms, ultrasound

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INTRODUCTION

Radiology request forms (RRFs) are the necessary communication tools between the clinician and the radiologist.[1,2] The radiologist's output is dependent on the referring clinician's input as communicated in the RRF.[3] It has been shown that incomplete filling of clinical information can have a detrimental effect on the outcome of a radiology report.[2,4] RRFs serve as clinical as well as legal documentation.[5,6] Therefore, inadequacies in filling

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RRF may have medico-legal implications and affect the quality of service provided by a radiologist.[7,8]

Furthermore, all request forms should be complete and legible to avoid misunderstanding the requested investigation and possible misinterpretation of results.[2,9] The importance of adequate completion of RRF by medical doctors cannot be overemphasized. Unfortunately, its importance is highly underrated.[10] Some studies reported the incomplete filling of RRFs as a global challenge which affects different regions and involves all imaging modalities.[2,3,11] The degree of inadequate filling differs from one hospital to another, from one geographic location to another, and over time.[11,12] The RRFs are filled by the most junior member of a medical team whereas the report is often read by the most senior member to make a management decision.[7,13] A referring clinician is required to state the reason for referral because it helps the radiologist to have a global view of the patient's condition. He subsequently determines the protocol required for optimal patient management.[14] This also helps to minimize the costs to patients and shorten patients' hospital stay time.

In obstetrics, ultrasound is the most frequently used diagnostic tool.[15,16] It has contributed remarkably to improved maternal and fetal health care through the early detection and diagnosis of diseases.[15,17] Obstetric ultrasound is done to determine the existence of pregnancy, its viability, fetal well-being and age, fetal anomalies, and other co-existing diseases or abnormalities as well as possible complications.[18,19]

Clinical audit has been recognized as an effective method for improving the quality of all aspects of patient care, including the proper completion of request forms.[20] The school of thought is that highlighting deficiencies in care audits can serve as a check against inefficient medical practices, thereby enhancing overall clinical services.[21] This study aimed to audit the adequacy of RRFs for obstetric ultrasound at the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, highlighting its significance for improving radiological reports and subsequently enhancing patient management.

MATERIALS AND METHODS

The study was a retrospective review of obstetric ultrasound request forms brought by patients from the Obstetric Unit to the Radiology department of the same tertiary hospital from January 1, 2019 to December 31, 2023.

The obstetric ultrasound request form of the hospital is tailor-made for the purpose, hence, a total of 1,160 request forms were evaluated. Sixteen (16) fields were identified in each form: Date of request, name, age, patient's contact, clinical diagnosis, clinical details, parity, Last Menstrual Period (LMP), Expected Date of Delivery (EDD), gestational age, information required, previous examination, doctor's signature, consultant's name/firm, patient mobility, and legibility of writing. The variable for each field was recorded in a data pro forma. The adequacy and completeness of filling of each field were assessed. A blank field was given a score of 0 (zero) while a completed field was given a score of 1 (one).

Data were collated and cleaned up using Microsoft 365 Excel spreadsheet software. Descriptive analysis was done for the percentages or proportions, and tables were used to represent the results.

Ethical approval was obtained from the Health Research and Ethics Committee of the teaching hospital. No extra consent was required from patients and patient confidentiality was maintained.

RESULTS

A total of 1160 request forms for obstetric ultrasound were evaluated: Each with 16 fields. The total of all fields was 18,560. The ages ranged from 17 to 52 years, with a mean age being 31.9 years. The most filled fields were the patients' name 100% (n = 1160) and date of request 99.1% (n = 1150). The least filled field was "mobility of patient" with an omission rate of 97% of 1125 RFFs. Other rates of omission or completion are shown in Table 1.

The study showed a high percentage of 34.0% (n = 6315), approximately a third of unfilled and inadequate fields in

Table 1: Request form fields and percentage of filled and unfilled form fields

	Unfilled/ omitted, *n* (%)	Filled/ complete, *n* (%)
Name of patient	0	1160 (100.0)
Date of request	10 (0.9)	1150 (99.1)
Age of patient	323 (27.9)	837 (72.1)
Patient's contact	928 (80.0)	232 (20.0)
Clinical diagnosis	90 (7.8)	1070 (92.2)
Clinical details	697 (60.1)	463 (39.9)
Parity	352 (30.4)	808 (69.6)
LMP	305 (26.3)	855 (73.7)
EDD	438 (37.8)	722 (62.2)
Gestational age	410 (35.4)	750 (64.6)
Information required	30 (2.6)	1130 (97.4)
Previous examination	1121 (96.6)	39 (3.4)
Doctor's sign	250 (21.6)	910 (78.4)
Consultant	236 (20.4)	924 (79.6)
Patient mobility	1125 (97.0)	35 (3.0)
Grand total	6315 (34.0)	12,245 (66.0)
Illegible writing	95 (8.2)	
Legible writing	1065 (91.8)	
Total	1160 (100.0)	

the request forms for obstetric ultrasound scans in the hospital.

DISCUSSION

The importance of radiologists' request forms is highly underestimated, despite being essential communication tools used by referring doctors for radiological investigations of their patients.

The patient's name, most often, is the most filled field. In this study, the field of the name was 100% filled. This is similar to studies by Akinola *et al*.;[10] Afolabi *et al*.,[12] Edzie *et al*.,[17] and Eze *et al*.[22] but in contrast to the reports by Robinson *et al*.[13] and Jimah[8] where few patients' names of 0.4% and < 10%, respectively, were unfilled. However, in the latter studies, the authors did not give any reason for this omission, but it may have been an oversight by those who filled out the forms without the patients' names.

Indicating the date of request is essential and has a medico-legal aspect. In this study, this was unfilled in 0.9%. The reports of 2.3% and 3% by Robinson *et al*.[13] and Afolabi *et al*.[12] are comparable. However, this contrasts with higher percentages of 8%, 11%, and 30% in studies by Irurhe *et al*.,[15] Oswal *et al*.,[7] and Agwu and Okoye,[23] respectively.

A patient's contact information is essential for any necessary future communication, such as in cases requiring a second opinion or encouraging the patient to return for follow-up after an initial disturbing finding. In the present study, 80% of this field was left unfilled. This is lower than the 95.8% reported by Akinola *et al*.,[10] but higher than the 25% reported by Jimah[8] in Ghana.

Age is crucial in arriving at a possible diagnosis and determining the best management for any patient. However, a significant number of the age fields were either left blank or improperly filled, with some forms simply written "adult" instead of providing a specific age. In the present study, 27.9% of the age fields were unfilled, comparable to the 20.8% reported by Adebayo *et al*.[24] and the 32% reported by Edzie *et al*.[17] Higher percentages of 55.9%, 48.1%, and 42% were noted by Afolabi *et al*.,[12] Robinson *et al*.[13] and Agwu and Okoye,[23] respectively. In contrast, much lower figures of 7.6%, 9.7%, and 12% were demonstrated by Eze *et al*.,[22] Akinola *et al*.,[10] and Jimah,[8] respectively.

Providing the patient's background health information is very important for ensuring a more accurate and informed report. In the present study, 60.1% of the field for "clinical detail/history" was left blank. This is comparable to the 68.5% omission rate reported by Edzie *et al*.,[17] which represents one of the highest rates of omission in this category in the literature. A study conducted in India by Rajanikanth Rao reported a 50% omission rate for this field.[3] Much lower percentages of < 10%, 13%, 18.5%, and 28.7% have been reported by Jimah;[8] Irurhe *et al*.,[15] Adebayo *et al*.,[24] and Eze *et al*.,[22] respectively.

The field for "information required" informs the radiologist about the necessary imaging and the specific part of the body to be imaged. In this study, 2.6% of this field was left unfilled. When this information is missing, it can cause some inconvenience for the patient, who may have to return to the clinic to clarify the required examination on the request form. This can be particularly problematic if the doctor has already left the clinic, leaving the radiologist to make assumptions that the request is for an obstetric scan because the patient is pregnant. However, a pregnant woman may require imaging for other conditions in different parts of the body. The 2.6% unfilled rate in this study is higher than the 0.4% reported by both Rajanikanth Rao[3] and Akintomide *et al*.[14]

The clinician indicating the patient's mobility prepares the radiologist on the mode of entry of the patient into the department/examination room and their ability to climb onto the examination couch unaided. This will help the radiologist make proper arrangements for extra hands to help the patient if need be. However, in this study, this had the least filled field of 97%. It is comparable to 98.6% reported by Eze *et al*.[22] at Nnewi and higher than 79.3% noted by Irurhe *et al*.[15] in Lagos. Leaving this field unfilled can cause delays in starting the investigation,[11] especially if the patient is in a wheelchair, trolley, or requires special assistance.

The "previous study" field was the second least filled on the RFFs, with 96.6% of this field unfilled. This is similar to the 96.7% omission rate reported by Irurhe *et al*.[15] but higher than the 84.2% reported by Adebayo *et al*.[24] The field of "previous study" helps the radiologist to know the past imaging findings if any and to compare them with present imaging, particularly if follow-up is required. Most obstetric patients are likely to have had previous ultrasound imaging.

Junior doctors are most often responsible for filling out the RRFs, making it essential for their seniors to supervise them to ensure the forms are completed thoroughly and accurately. In this study, 21.6% of the doctors' names were

left blank. This is higher than the < 10% and 15% omission rates reported by Jimah[8] and Oswal *et al*.,[7] respectively, but lower than the 27.9% reported by Robinson *et al*.[13] In tertiary hospitals like ours, patients are managed by units comprised of doctors at various levels of qualification, headed by a consultant(s) who makes the final decisions about the patients in their care. This study found that in 20.4% of RRFs, the field for "consultant in charge" was left blank. This is comparable to the 18.3% omission rate reported by Robinson *et al*.[13] but contrasts with the lower rate of 8% reported by Oswal *et al*.[7]

This study noted that 8.2% of the handwriting of doctors was illegible. This is comparable to 7.4%, as reported by Akintomide *et al*.[14] Legible writing saves time for both the radiologist and the patient and facilitates a smooth workflow. However, illegible writing can cause initial confusion, as the request form may be passed from one doctor to another in the radiology department, with each trying to decipher the information before attending to the patient. The significant benefits to patients, clinicians, and radiologists of properly and thoroughly completing RRFs extend beyond obstetric ultrasound to all imaging modalities and cannot be overemphasized.

A limitation of this study was its retrospective audit of request forms over the past 5 years, which posed a challenge in assessing all forms. Due to improper storage, some forms were damaged beyond recognition or lost. However, this was a minimal issue, thanks to the department's extensive storage capacity.

Our study concurs with a recent systematic review, which showed a generalized noncompliance in filling RFFs.[11] Radiologists are often not provided with adequate information needed to make a diagnosis, narrow down differential diagnoses, or provide timely and lifesaving feedback. This can negatively impact the quality, the outcome of the radiology report,[2] and the overall clinical decision-making process.

CONCLUSION & RECOMMENDATIONS

This study shows that a high proportion of the fields of the request forms were inadequately filled and highlights the importance of properly and thoroughly completing request forms, which will help improve the quality of reports, patient care and follow-up, as well as training and research. We therefore recommend the following:

1. Radiologists should conduct training sessions and periodic updates for house officers, newly employed doctors, and all clinicians to educate them on the importance of thoroughly completing every field on the request forms
2. Frontline staff at the imaging department should be trained to return any inadequately completed forms to the referring clinician for proper completion
3. Health facilities should ensure that electronic request forms adhere to international best practices
4. Electronic request systems should be programmed to require that all fields are compulsorily filled before the form can be transmitted to the radiology department
5. The doctor's contact information should be included in the RRF to enable easier access to incomplete information and better collaboration for case follow-up.

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Conflicts of interest

There are no conflicts of interest.

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