COMMENTARY

The case for gynaecologist-led point of care ultrasound services in sub-Saharan Africa

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Introduction

The value of pelvic ultrasound in women presenting with gynaecological symptoms is well established. Since the introduction of transvaginal ultrasound probes in the early 1980s, gynaecological ultrasound has evolved beyond routine measurements of the uterus and adnexae and the description of simple and complex adnexal masses to providing sonographic criteria for predicting the benign or malignant nature of adnexal masses[1].

In women with abnormal bleeding, gynecological ultrasound has helped to determine the presence of morphological and/or structural changes of the endometrium and provide excellent delineation of the endometrial cavity (with saline sonohysterography) as well as guide appropriate planning of therapeutic procedures[2]. It also has an important role in the evaluation of women presenting with acute and chronic pelvic pain, improving diagnostic and therapeutic capabilities in patients presenting with pelvic inflammatory disease, ovarian torsion, and endometriosis[2-4].

Furthermore, gynaecological ultrasound together with the quantitative measurements of beta human chorionic gonadotrophin (bhcG) provides the best imaging modality to improve the diagnosis and management of early pregnancy complications[2]. Among women presenting with infertility, gynaecological ultrasound is useful for evaluating the integrity of the reproductive tract, monitoring physiological or pathological cyclic changes of pelvic organs, and guiding fertility treatments. More recently, in women with pelvic organ prolapse, gynaecological ultrasound has been useful in the pre-surgical assessment and quantification of pelvic organ descent and the planning of surgical treatment[2,5]. This evolution of gynaecological ultrasound is not only a consequence of the technological advances in ultrasound imaging equipment but is also related to the emergence of women's health specialists with special interest and training in gynaecological ultrasound imaging[6].

In high-income countries, these subsets of women's health clinicians with expertise in gynaecology ultrasound have contributed to declines in the rates of gynaecological morbidity and mortality[7]. Their efforts have led to improved knowledge around the management of early pregnancy complications, sonographic recognition of non-ovarian markers of endometriosis, prediction of malignant adnexal lesions, and advancement in assessments in reproductive medicine such as follicle tracking, egg harvesting, and embryo transfers[1,4,8].

By contrast, the evolution of gynaecological ultrasound in sub-Saharan Africa has been slow to take effect. Research from the region has focused mostly on women's knowledge, attitudes, and perception towards gynaecological ultrasound, and less on quality-of-service provision and the training of providers. Thus, despite the general acceptability of gynaecological ultrasound among women in sub-Saharan Africa, there remains a low utilization rate of the imaging service compared to other regions (1 - 5.5% in Nigeria vs 20% in rural India)[9-12].

Strategies like appropriate counselling and education, the provision of a suitable environment for women, and having experienced and knowledgeable service providers have been identified as essential to improving the utilization

rates of gynecological ultrasound among women in this region[12]. Currently, patients presenting with gynaecological symptoms are referred to an unfamiliar radiology department (when available) for a scan where the ultrasound images are obtained primarily by sonographers who may not have the resources to appropriately counsel the patient and may be unqualified to share real time clinical information with the patient. These characteristics are unlikely to improve the utilization rates of gynaecological ultrasound or engender confidence in the service.

With the growing recognition of the value in clinician (non-radiologist) provided point of care ultrasound services in sub-Saharan Africa[13,14], it is time to rethink our strategy for gynaecological ultrasound in the region. Gynaecologists in sub-Saharan Africa like their counterparts in developed countries are uniquely suited to provide this service as they also have a vested interest in learning ultrasound examination of the pelvis. They have a better understanding and recognition of gynecological pathology and anatomy compared to radiologists and already provide a suitable environment for gynaecological examinations[8,15]. Further, it is clinically efficient for an ultrasound-trained gynaecologist to complete a pelvic ultrasound as part of a physical examination rather than have the patient wait for the service in an unfamiliar radiology department. Indeed, an ultrasound machine should be as vital a piece of equipment in routine or emergency gynaecological assessment as the Cusco speculum[8]. This 'same visit' approach has the additional advantage of reducing diagnostic delays for women presenting with gynaecological symptoms and provides opportunities for immediate counselling and discussion of treatment options at the same time thereby reducing the direct and indirect costs related to multiple visits to health care professionals[16]. This is especially important for women in low-income countries that tend to rely on self-funding for health care.

Unlike the high-income countries where gynaecological ultrasound training is part of the core curriculum of specialty training program[17], gynaecological ultrasound training in sub-Saharan Africa is underdeveloped with no formal specialty training programs. Where the services are available, they are often self-taught, depend on the patient population, and exhibit a significant mismatch between theoretical knowledge and practical skills[8,18,19]. However, for the region to be successful in developing a cohort of women's health specialists with special interest and training in gynaecological ultrasound imaging capable of providing sustainable and quality women's health services, a number of considerations are essential.

These include ultrasound equipment, training needs, record keeping, and accurate reporting.

Ultrasound equipment

Ultrasound is a sustainable technology for low-income countries as the machines are now more affordable, available, portable, and durable. Unlike other imaging modalities (CT scan and MRI), ultrasound lacks a requirement for special films, chemical developers, and dedicated technicians[18]. The machine designs have also become more user-friendly for novice users with fewer knobs and streamlined design for quick comprehension of key features[13]. Most gynaecologists in sub-Saharan Africa can afford them but the "plug and play" nature of the ultrasound machine could pose a significant risk to the individual if not used or maintained appropriately[8,20]. Thus, a system of quality assurance will need to be established for gynaecologist-led delivery of ultrasound services similar to what is available for radiologist-led imaging services.

One consideration is to ensure that ultrasound equipment used for gynaecologist led delivery of imaging services have ongoing service agreements. All ultrasound machines must pass electronic safety checks prior to being delivered. They are also usually covered by an initial service agreement from the manufacturer. Overtime, these service agreements may not be renewed, and the ultrasound machines are no longer subjected to regular servicing and appropriate safety, and calibration checks [8]. Ensuring a robust system of equipment registration and maintenance that includes verifiable protocols for servicing, safety and calibration checks will be essential if gynaecologists are to perform their ultrasounds and maintain the same level of quality assurance as their colleagues in radiology departments. This requirement is now more attainable in developing countries as a number of ultrasound manufacturers have dedicated resident sales and service

representatives, reducing the reliance on poorly trained third party service technicians and giving service providers the opportunity to maintain adequate equipment standards.

Training needs

Training is critical to the quality and sustainability of gynaecological ultrasound services. In recognition of this, the WHO has established standards in ultrasound training and recommended that an appropriate curriculum be adopted for the training of practitioners in the use of diagnostic ultrasound[20]. Their recommendation also highlighted a critical role for professional societies and the need for appropriate legislation and regulation.

In the United Kingdom, for example, the Royal College of Obstetrics and Gynecology (RCOG) has introduced a number of ultrasound training modules in their core specialty training program (see Table 1)[17]. Each module has a competency-based curriculum/logbook and work-based assessments inclusive of objective structured assessment of technical skills and case-based discussion.

Such a comprehensive structured approach to capacity building in ultrasound for registrars in specialty training is currently not available in the core training curricula of obstetrics and gynaecology specialty in sub-Saharan Africa. Rather ultrasound training in these countries has relied primarily on training courses that have varied in length, curriculum, and method of training[13,14]. In one such program, the four-day course consisted of morning interactive classroom sessions addressing basic ultrasound physics, the use of ultrasound machine knobs, and reviews of specific clinical ultrasound applications. The afternoons and early evenings were spent doing hands-on examinations of inpatients and outpatients[21]. Over a 2-year follow-up period, the program performed 547 ultrasound examinations on 460 patients, 22% of these ultrasound examinations were pelvic ultrasound[21]. In another program that lasted 9 weeks, the course included lectures, hands-on practice sessions, and scan time for trainees overseen by an instructor[22]. The program also included bimonthly review sessions and provided opportunities for physicians to send images via email for ongoing quality assurance after the training period ended[22].

Current evidence suggests that such short but intensive training course can be sufficient to prepare clinicians to perform basic ultrasound exams, especially if the training course included didactic lectures and practical experience as well as provide an opportunity for the continued upkeep of skills through review sessions and ongoing quality assurance after the training period ends[13]. This approach offers a window of opportunity for gynaecologists in sub-Saharan Africa to formally acquire basic pelvic ultrasound skills, improve their clinical efficiency and enhance the value of care they provide to women presenting with gynaecological symptoms[23]. Initially, this approach could address existing gaps in gynaecological ultrasound service provision and result in a cohort of well-trained specialist pioneers in gynaecological ultrasound for the region, however, it is not the alternative to a formal training program within the core curriculum of specialty training.

Record keeping and accurate reporting

Another key area for consideration in gynaecologist led ultrasound services is record keeping. Keeping a permanent record of an ultrasound examination not only serves as a medico-legal document, but can also facilitate chronologic comparison of previously identified pelvic abnormalities and guide clinical decision making. The radiology departments have excelled in this regard by having a radiology management system linked to a picture archiving and communication system (PACS). Thus, patient examinations have permanent records with representative images and readily available reports.

Gynaecologist-led ultrasound services in low-income countries must strive to reach similar standards. Unstructured handwritten reports and thermal images stapled to the patient's file are suboptimal as they can be easily lost. Gynaecologists providing ultrasound services must be aware of technological tools like the Digital Imaging and Communications in Medicine (DICOM) system and some of the standardised gynecological imaging reporting systems like the Viewpoint™ and MonEcho Report™. Alternatives like adapting gynaecology ultrasound reporting systems to suit local reporting needs and storing representative images and reports in large capacity hard drives may be less cost intensive for gynaecologists in developing countries.

Table 1: RCOG ultrasound training modules[17]

Module	Level	Completion Date for Trainees
Early pregnancy ultrasound (8–12 weeks)	Basic	Mandatory completion by end of StR5 (preferably by the end of StR3 if commencing at StR1)
Ultrasound assessment of fetal size, liquor, and the placenta	Basic	
Ultrasound of normal fetal anatomy	Intermediate	Undertake selectively, either prior to undertaking ATSM/subspecialty training (i.e., during StR4–5) or in some cases parallel with ATSM/ subspecialty training (i.e., during StR6–7)
Ultrasound in gynaecology	Intermediate	
Ultrasound of early pregnancy complications	Intermediate	

ATSM = advanced training skills module; StR = specialty training (year)

Conclusion

Gynaecologist led point of care ultrasound services in women's health confers significant advantages to the quality of care we provide to women presenting with gynaecological symptoms. We acknowledge the growing urgency of a number of obstetrics and gynecology colleges in developing countries to initiate work that will lead to the introduction of basic ultrasound training in the core curriculum of their specialty training. As this process evolves, there is the immediate need to upskill the capacity of practicing clinicians to provide gynaecological ultrasound through short but intensive training courses with inbuilt quality assurance and image review processes after the period of training. These cohort of trained gynaecologists will be the critical resource for the Colleges of Obstetrics and Gynaecology once ultrasound training becomes part of the core specialty training curriculum.

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