CHANGING THE WAY WE TRAIN ULTRASOUND

A ROMBO DISTRICT EXPERIENCE

Introduction

Increase in the availability of ultrasound equipment has led to the expected increase in demand for well trained operators; the need for training in obstetric ultrasound has been established. [1] Kilimanjaro Christian Medical Center has for the last decade offered a 3 months short course in basic abdominal sonography and obstetric ultrasound. With increasing number of students and limited space, we have seen an increase in the waiting list.

To meet the increasing demand for ultrasound training we have collaborated with SmW under the guideship of the European Society of Ultrasound in Medicine and Biology (EFSUMB) and explored a different pattern of training in which a trainee is enrolled into at least 3 expert led intensive workshops with about 3-6 months intervals which are followed by individual and group trainings.

Over the last two years we have enrolled interested participants from various districts in Kilimanjaro region. By November, 2016: 43 participants were trained from ROMBO, SIHA and MOSHI district; 14 passed the exam and received "Certificate of competence".

A number of training curriculum and methods have been tried in resource limited setup which included an intensive expert led lectures and practical training which had a duration ranging between 4 days and 6 months with concordance as high as 96%. [1,2,3]

Pilot area and participants

The pilot area is Kilimanjaro region which was selected out of convenience. The training center is Huruma hospital which is a designated district hospital for Rombo district.

To date, 3 districts in the Kilimanjaro region have participated in the program viz Rombo, Siha and Moshi. Hai and Same district have confirmed participation in the upcoming course in February, 2017.

The course sends an open invitation to the health facilities which then select individuals to be trained. The participants' professional qualifications inlcude radiographers, nurses, clinical officers, assistant medical officers, medical officers and residents.

The trainers

The training group include a team of Swiss practitioners and trainers registered by both the European Society of Ultrasound in Biology and medicine (EFSUMB) as well as the Swiss Society of Ultrasonography (SSUG) in collaboration with radiologists from Kilimanjaro Christian Medical Center (KCMC) and Kenya Medical Training Center (KMTC). This team of experts serve as the referents and lead instructors. They are supported by physicians, radiographers and radiology officers who have an interest and practise in ultrasound scanning. These instructors have attended one or two intense courses prior to their assignment.

The training method

Modular training which includes 4-7 days of intensive expert led training followed by 3- 6 months individual training. The trainees are expected to attend bi-weekly group training under supervision of a course referent in addition to their routine supervised practise at their center or nearby center where an instructor is available.

Bi-annual 4-5 days intense expert led training

- The participants are invited to a short intesive training that is condcuted in collaboration with international and local experts. This training last for 4-5 days with a total of 20-28 hrs where about 50% of the time spent in practical training.
- On the first day of training the chairman of the program conducts a "training of trainers" (teach the teachers) session for the instrcutors to standardize the training conducted. Any changes that need to be made to the practical approach are discussed during this session.
- Parctical training is conducted as small wrok groups of about 4-5 participants; the groups rotate to different instructors.

6 Months indivudual training under supervision

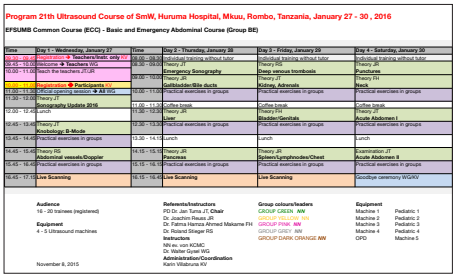
- Continued supervised training
- The participant is required to perform about 100-200 obstetrics scan under supervision between the two intensive courses.

Bi-weekly supervised group training

- In addition to individual training he/she is required to atttend the supervised group scans conducted weekly/bi-weekly.

Total number of training programs since 2015: 4

Sample time-table



Program 21th Ultrasound Course of SmW, Huruma Hospital, Mkuu, Rombo, Tanzania, January 27 - 30 , 2016

EFSUMB Common Course (ECC) - Basic and Emergency Abdominal Course (Group BE)

Time	Day 1 - Wednesday, January 27	Time	Day 2 - Thursday, January 28	Day 3 – Friday, January 29	Day 4 – Saturday, January 30
08:00 - 08:45	Registration → Teachers/instr. only !!!	08:00 - 08:30	Individual training without tutor	Individual training without tutor	Individual training without tutor
08:45 - 10:00	Welcome → Teachers WG	08:30 - 09:00	Theory JT	Theory RS	Theory JR
10:00 - 11:00	Teach the teachers JT/JR		Emergency Sonography	Emerg. venous thrombosis	Punctures
11:00 - 11:30	Registration → Participants !!!	09:00 - 10:00	Theory JR	Theory JT	Theory FH
11:30 - 11:45	Official opening session → All WG		Gallbladder/Bile ducts	Kidney, Adrenals	Neck
11:30 - 12:00	Theory JT	10:00 - 11:00	Practical exercises in groups	Practical exercises in groups	Practical exercises in groups
11:45 - 12:00	Sonography Update 2016	11:00 - 11:30	Coffee break	Coffee break	Coffee break
12:00 - 12:45	Lunch	11:30 - 12:30	Theory FH	Theory JT	Theory JT
			Liver	Bladder/Genitals	Acute Abdomen I
12:45 - 13:45	Theory JT	12:30 - 14:00	Practical exercises in groups	Practical exercises in groups	Practical exercises in groups
	Histology: B-Mode				
13:45 - 14:45	Practical exercises in groups	13:30 - 14:00	Lunch	Lunch	Lunch
14:45 - 16:45	Theory RS	14:15 - 15:15	Theory JR	Theory JR	Examination JT
	Abdominal vessels/Doppler		Pancreas	Spleen/Lymphnodes/Chest	Acute Abdomen II
15:45 - 16:45	Practical exercises in groups	15:15 - 16:15	Practical exercises in groups	Practical exercises in groups	Practical exercises in groups
16:45 - 17:15	Live Scanning	16:15 - 16:45	Live Scanning	Live Scanning	Goodbye ceremony WG/KV

Audience: 16 - 20 trainees (registered)
Equipment: 4 - 5 Ultrasound machines

Referents/Instructors: PD Dr. Jan Tuma JT, Chair; Dr. Joachim Rauss JR; Dr. Fatma Hamza Ahmed Makame FH; Dr. Roland Stieger RS
Instructors: NN ex. von KCMC; Dr. Walter Gysel WG
Administration/Coordination: Karin Wildhaus KW

Group colours/leaders: GROUP GREEN: NN; GROUP YELLOW: NN; GROUP PINK: NN; GROUP GREY: NN; GROUP DARK ORANGE: NN

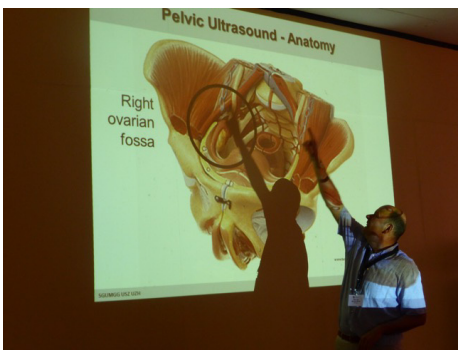
Equipment: Machine 1, Machine 2, Machine 3, Machine 4, OPD; Pediatric 1, Pediatric 2, Pediatric 3, Pediatric 4, Machine 5

November 8, 2015

Evaluation

Participants are evaluated subjectively by the instructors during the intensive training courses, those with less than satisfactory performance are instructed on areas to improve on. After two intensive expert led short training course the participants who satisfy the majority of the instructors are called for a voluntary competency exam where they will sit for a written multiple choice examination as well as a practical examination which examines the candidates ability to optimize the image, recognize relevant anatomy and pathology, make correct measurements and image archiving.

Total number of competent sonographers from Rombo: 7



Challenges:

1. Unsatisfactory participation in individual scanning as well as group scanning.
2. Inadequate supervision of the trainees.
3. Drop out of about 33%.

Discussion

There are various training methods that have been used in the training of ultrasound to various members of the medical team including non-radiology staff and students. Most of these training methods aim at maximising hands-on experience and reducing class time while ensuring the quality of diagnostic standards. Some studies have shown that short hands on training results to trainees with competence that match the trainers in obstetric as well as emergency ultrasound scanning. [1,4]

WHO recommends that a trainee conducts a minimum of 200 scans to be considered competent but due to human resource constraints which results to lack of enough supervisors we allowed the participants to submit at least 100 scans conducted individually, these are recorded in a statistic sheet that doesn't include the patients name. Approach of using log books was used by a study in Kigoma refugee camp. This aided in the evaluation of the participants and in getting the overview of the utilization, indication and pathology. [3]

Limitations

This is a retrospective review and it therefore does not involve evaluation of concordance/levels of agreement and it can therefore not provide information on the efficiency of the training program.

The trainees did not have a pre-test prior to the training and therefore we cannot evaluate the impact of the training to the participants knowledge and interpretation skills.

There were no specified quality assurance measures to monitor the individual scanning.

Recommendation

A prospective study is needed to evaluate the US training program in terms of knowledge and skills gained, concordance between trainees and trainers as well as quality assurance measures.

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KILIMANJARO CHRISTIAN MEDICAL CENTRE
DEPARTMENT OF DIAGNOSTIC RADIOLOGY & MEDICAL IMAGING

SCREENING

Introduction

- High rate of maternal death is one of the major public health concerns in Tanzania. Most maternal deaths are caused by factors attributed to pregnancy, childbirth and poor quality of health services. [1]
- Obstetric ultrasound has potential to reduce maternal and neonatal deaths through early diagnosis of risk pregnancy.
- Routine ultrasound scanning during the first and second trimesters of pregnancy has become a common practice and an integral part of antenatal care in many countries in the world. [2]
- In Tanzania, women undergo ultrasound scanning following an attending clinician or midwife's recommendation and feel that it is obligatory and thus do not decline the service. [3]
- There is a published study that has looked at the belief and expectations of pregnant women regarding the use of antenatal ultrasound which followed the introduction of ultrasound at Boma N'gombe in Hai district of the Kilimajaro region. [3]
- Even though antenatal ultrasound screening is performed in various parts of Tanzania, to our knowledge there are no studies that have documented the uptake of ultrasound in antenatal care in Tanzania, the indications or the impact that the sonographic outcome has on the choice of delivery center.
- This study provides baseline information on the utilization, indications and sonographic outcome at Huruma district and is a pilot for a future health system study in service delivery.

Purpose of the study

This study investigated the ultilization, indications and sonographic outcome of antenatal ultrasound among women who attended Huruma District Hospital from 2014 to 2016 as well as followed the referrals to Kilimanjaro Christian Medical Center (KCMC) and determined the level of agreement between the primary screening center and the tertiary center.

Sample

This study included a complete sample of 2195 women who attended the antenatal clinic at Huruma district hospital during the study period.

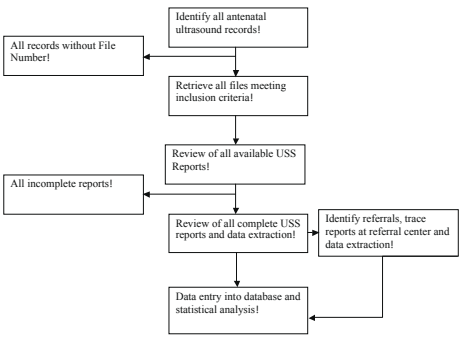
Methods

Study design:
Hospital based descriptive cross sectional study using secondary data which was recorded between 2014 and 2016 at the antenatal clinic and ultrasound unit.

Inclusion criteria

The study included all records of pregnant women who underwent antenatal ultrasound scan at Huruma Hospital at 2nd and 3rd trimester as well as those referred to KCMC.

Data collection



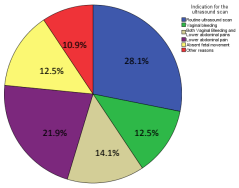
Results

Utilization of ultrasound in antenatal care

Year of Attendance	ANC 1st visits (females)	Obstetric ultrasounds done	Obstetric ultrasound reports recruited for the study
2014	768	142	35
2015	715	259	16
2016	712	359	13
Total	2195	760	64

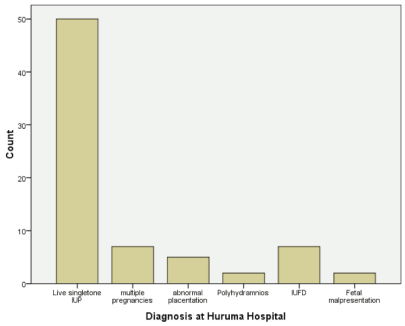
A total number of 64 records were selected out of a total 760 obstetric ultrasound scans that were done from the year 2014 to 2016.

Indication for ultrasound scanning



Routine ultrasound scan was done in 28.1% of clients and the leading indication for ultrasound scan was lower abdominal pains which constituted 31.5% of the reasons for scanning.

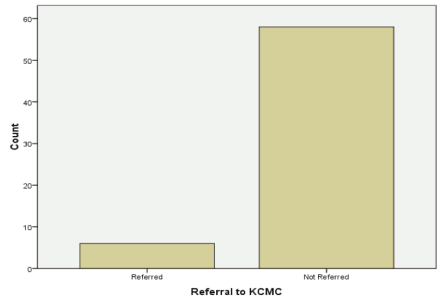
Sonographic outcome



78.2% of clients had live singletone pregnancies, 10.9% had multiple pregnancies and 10.9% had IUFD.

Abnormalities in placentation(placenta praevia) constituted 6.6%, fetal malpresentation(breech) 2.6%, and uterine myoma was found in 1.3% of patients.

Referral to tertiary center (Kilimanjaro Christian Medical Center



9.4% of patients were referred to KCMC with the leading reason for referral being placenta praevia which constituted 33.3% of all reasons for referral.

Discussion

The national average of the ultilization of Antenatal care (ANC) is about 94% for women who have at least one visit and 62% for women who have at least 4 visits.

Between 2014 and 2016 about 2195 women attended the antenatal clinic at Huruma district hospital however only 35% of women had antenatal ultrasound scan. This pattern differs from the ultlization of antenatal ultrasound scan in rural eastern China where it was estimated to be about 96.1% in a population whose ultilization of Antenatal care services was at 96.8%. [4]

Of all antenatal ultrasounds conducted only 28% were routine screens. The leading clinical indication for antenatal ultrasound was lower abdominal pain which constituted about 22% of all women screened. The clinical indications for antenatal ultrasound screening do not differ from those already documented in various publications. [5,6]

Antenatal ultrasound scanning resulted to referral of 4 patients corresponding to about 6.3% of the women scanned; a much higher impact was seen in a study conducted in a rural district hospital in Tanzania where a change in management was 22%. [7]

Limitations

Small sample of refred patient for reliable calculation of overall percentage agreement.

Recommendation

There is a need to conduct a larger prospective study that will evaluate the impact of screening programs in patient management and quality assuarance.

References

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