INTRODUCTION

- Abdominal X-Rays (A X R) and Ultrasound (US) are commonly used in evaluating patients with abdominal pathology.
- Anyawu (1998) claimed that A X R provide very little information only with patient presenting with obstruction are X-Rays valuable.
- This study was conducted at Groote Schuur Emergency Unit to determine if Ultrasound provide a faster final diagnosis than X-Rays for patients presenting with abdominal pathology.

AIM

The aim of the study is to access the effectiveness of abdominal X-Rays and whether Abdominal Ultrasound is more effective in diagnosing abdominal pathology.

DEFINITION OF ACUTE ABDOMEN

- ANY PATHOLOGICAL CONDITION OF THE ABDOMEN THAT THE PATIENT PRESENTS WITH, e.g. OBSTRUCTION, GALLSTONES, APPENDICITIS, ABDOMINAL PAIN, GYNEA PROBLEMS, ...

OBJECTIVES

- To determine if Ultrasound provide a better and faster diagnosing method for evaluating patients presenting with abdominal pathology.
- To determine that ultrasound eliminate any additional test the patient had to undergo to obtain final diagnosis so as to minimize cost and decrease the stay of patient time in the hospital to stretched the hospital budget.
- A final aim is to determine if radiation to patients can be minimized and radiation safety of the Radiographer can be improved.
**HYPOTHESIS**

- **Hₐ** Abdominal ultrasound provide a speedy diagnosis compared to Abdominal X-Rays with patients presenting with abdominal pathology, confirms the final diagnosis, eliminate extra examinations and speed up the treatment of the patient.

- **Hₒ** Abdominal Ultrasound does not provide a speedy diagnosis compared to abdominal X-rays with patients presenting with abdominal pathology, does not confirm the final diagnosis, does not eliminate extra examinations and doesn’t speed up the treatment of the patient.

**OBTAINING A DIAGNOSIS**

- When a patient present with an abdominal complain, the diagnosis can based on:
  - The clinical evaluation of the medical practitioner
  - The diagnosis of an X-Ray for the patient
  - Both the clinical diagnosis and X-Ray of the patient
  - The Ultrasound diagnosis of the patient
  - Both the clinical diagnosis and Ultrasound of the patient
  - Any other diagnostic procedure requested by the doctor, example blood or urine tests, CT or MRI
  - Other methods to determine a diagnosis
  - Both X-Rays and Ultrasound examination of the patient

**METHODOLOGY**

- **Study Design:** Retrospective Study
- **Instrument of Measurement:** Data Capture Sheet
- **Study Setting:** Information was collected from patients folders presenting with abdomen pathology at GSH medical emergency department.
- **Target Population:** Adult patients with abdomen pathology at GSH medical emergency department who received both Abdominal X-Rays and Ultrasound within 7 days

**METHODOLOGY (Cont)**

- **Sample Size:** 22
- **Age:** Adults
- **Systematic Randomly Selected**
- **Permission obtained from Chief Radiographer in Charge at GSH**
- **The Data Capture sheet was completed by the Researchers from the patients folders**

**EXPECTED RESULTS**

- The expected results are that ultrasound is more suitable in evaluating patients with abdominal pathology and that the final diagnosis corresponds in most cases with the diagnosis on the ultrasound examination.

**DATA COLLECTION**

- Data was collected from patients folders onto a Data Capture Sheet
- The patients folders was evaluated by the researchers
DATA CAPTURE SHEET

DATA CAPTURE SHEET USED
- Shortened
- Data
- Capture Sheet
- Due to Time
- Limitation

26% OF PTS THAT HAD AXR AND US WITHIN A WEEK. ALL PTS HAD AXR

PATIENT THAT HAD AXR FOR THE SAMPLING PERIOD (415 PATIENTS), 107 PTS HAD AXR AND US WITHIN A WEEK, 308 PTS DID NOT HAD AXR AND US WITHIN A WEEK OR JUST AXR

SAMPLE SIZE

MALE/ FEMALE % AGREES WITH Chhetri RK (2005)
ACUTE ARBO AFFECT 2X MALES THAN FEMALES

OBTAINING THE SAMPLE SIZE
- 415 Pts were screened who had A X R at GSH from 1 May 2006 until 31 July 2006
- 107 Pts had US and A X R within a week
- Sample Size (20% of May, June, July total) = 22
- 1st Pt was selected Randomly
- Every 5th Patient was selected for sampling
- 20% X 107 =21.4 and 107/21.4=5 (every 5th patient)
EXTRACTING INFORMATION FROM DATA OBTAINED

A total of 52 deductions were made from the data extracted from the 22 patients samples:

AGREES WITH RESEARCH DONE BY (George R. 1984) INDICATING US HAS A ↑ SENSITIVITY THAN AXR

DIAGNOSIS OBTAINED WITH AXR

COMPARING THE DIAGNOSIS ON AXR FOR PATIENTS

Choosing a X R and US

COMPARING AX R AND US

A TOTAL OF 52 DEDUCTIONS WERE MADE FROM THE DATA EXTRACTED FROM THE 22 PATIENTS SAMPLES:

"COMPARING A X R AND US DIAGNOSIS WITH FINAL DIAGNOSIS OF PATIENTS"


AGREES WITH RESEARCH DONE BY (George R. 1984) INDICATING US HAS A ↑ SENSITIVITY THAN AXR

AGREES WITH RESEARCH DONE BY (George R. 1984) INDICATING THAT US HAS A 95% ACURACY WITH <50% FOR AXR

LOOKING AT OBJECTIVES

To determine if Ultrasound provide a better and faster diagnosing method for evaluating patients presenting with abdominal pathology.

FINAL/X-RAY/ULTRASOUND DIAGNOSIS
To determine that ultrasound minimize additional test the patient had to undergo to obtain final diagnosis so as to minimize cost and decrease the stay of patient time in the hospital to stretched the hospital budget.

89% of Patients waited at least 1 day for Ultrasound which corresponds with final diagnosis.

A final aim is to determine if radiation to patients can be minimized and radiation safety of the Radiographer can be improved.

| Evaluation of A X R was inconclusive or NAD. Note 100% of Pts had a final diagnosis |
|---------------------------------|---|---|
| X-Rays                          | 7 | 32% |
| X-Rays with normal X-Rays (X-Rays NAD) | 10 | 45% |

89% of Patients waited at least 1 day for Ultrasound which corresponds with final diagnosis.

SUMMARY OF RESULTS

The results suggest that US is more effective when evaluating patients with abdominal pathology requested to evaluated Acute Abdomen.

- The diagnosis on Ultrasound corresponds 82% with the final diagnosis where
- The diagnosis on Abdominal X-Rays corresponds only with 9% of final diagnosis

Conclusion from results

- From the information evaluating the results, the data indicate that Ultrasound is more effective and sensitive when evaluating patient with abdominal pathology with an 82% accuracy whereas X-Rays only has a 9% accuracy.
- When Ultrasound and X-Rays can contribute to the diagnosis of a patient’s pathology, then 91% of patients had a diagnosis with Ultrasound where only 14% of patients had a diagnosis with Abdominal X-Rays.

RECOMMENDATIONS

- The Radiographer, Ultrasonographer and Medical officer must work closely in a team to ensure that the patient receives the best service possible.
- If Radiographers can do pattern recognition, their input will benefit the patient as they will perform and report on the X-Rays.

RECOMMENDATIONS(Cont.)

- Medical officers can utilize input from other specialties including Radiographers and Ultrasonographers when deciding what examination will best fit the differential diagnosis present.
LIMITATIONS OF THE STUDY

- A larger sample size can be obtained by sampling over a longer period. Obtaining the information from the patients folders is a difficult task as there are a lot of information that need to be shifted through.
- Completing the Data Capture sheet also need to be upgraded with the vital information extracted from the patients folders.
- Better time management and administrative issues need to be sorted out in time.

Possible impact on the community

- That medical officers will use the most effective image modality if both ultrasound and X-Rays are available.
- Ensure the patient receive the best treatment as quickly as possible and can minimize the length of stay of patients in hospital.
- Can minimize the financial expenditure on patients presenting at the emergency unit ensuring a big saving on the hospital budget.
- Free emergency beds quickly for other patients that present at the emergency room.

Possible impact on the community cont...

- Besides the above the best impact it will have is to improve service delivery to the patient presenting in the health clinical, hospital, emergency unit or any satellite clinic for the best treatment and care the patient deserve.

AKNOWLEDGEMENT

- We hereby extend our sincere thanks, gratitude and appreciation towards each of the following who assisted us with the B.Tech Research Project:
  - Radiography Staff at Groote Schuur Hospital
  - Other supporting staff at Groote Schuur Hospital
  - Mr. Ashraf Mohammed – Lectured who gave guidance and advice.
  - All others that gave support and input in the research project.

REFERENCE

- American Journal of Radiology 144: 1

THANK YOU