

Role of Ultra Sonography in Abdominal Injuries

Ramgopal¹, Jamil Shaik²

¹Professor, Department of Radio diagnosis, Chalimedda Anandarao of medical college Karimnagar, Telangana, ²Assistant Professor, Department of Radio diagnosis, Icare institute of medical sciences Haldia, West Bengal.

Abstract

Background: Ultrasonography is a cheap, Readily available, safe and non invasive investigation used in the evaluation of patients with abdominal injuries. No radiation effects are seen in ultrasonography. Along with ultrasonography, CT scan and MRI is also used in diagnosing different abdominal lesions. Aim of the study: Aim of our study was to evaluate diagnostic value of ultrasonography in the patients with abdominal injuries. **Subjects and Methods:** 120 patients were included in this study. Out of these 120 patients 95 patients were admitted with blunt abdominal trauma and 25 patients were admitted with penetrating abdominal injuries. Ultrasonography results in each patient is classified as true positive, false positive and false negative by comparing with findings at either diagnostic peritoneal lavage or surgery (1). **Results:** Out of 120 abdominal injury patients 95 were with blunt trauma and 25 patients were admitted with penetrating abdominal injuries. By scanning to detect free fluid, true positive were 102(85%) and false positive were 8(6.6%) false negative 6(5.2%) true negative are 9(7.5%). **Conclusion:** ultrasonography has a high diagnostic value in the screening of patients with blunt abdominal trauma and penetrating type injuries. In developing countries and in rural part of India emergency diagnostic facilities especially radiological investigations like ultrasonography and CT scan are lacking. So government has to take initiatives in arranging these type of diagnostic facilities to prevent the morbidity and mortality due to abdominal injuries.

Keywords: ultrasonography, abdominal injuries, diagnosis, haemo peritoneum.

Corresponding Author: Dr. Jamil Shaik, Assistant Professor, Department of Radio diagnosis, Icare institute of medical sciences Haldia, West Bengal.

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Introduction

Ultrasonography is a technique using echoes of ultrasound pulses to delineate objects or areas of different density in the body.^[2]

In Blunt abdominal injuries, most of them are caused by road traffic accidents, fall from height and hitting with any objects, the organs injured are liver, spleen, kidney, omentum, intestines, kidneys and urinary bladder.

In penetrating injuries the organs injured are liver, spleen, pancreas, abdominal aorta, stomach, intestines, kidneys, and urinary bladder.

The injuries may be contusions, mild lacerated injuries and sometimes associated with large lacerated injury with massive bleeding into peritoneal cavity and sometimes with haematoma formation.^[3]

Abdominal radiography has historically been the first imaging examination performed in the emergency department in evaluating abdominal pain. Interpretation of these radiographs may present a formidable challenge to the radiologist.^[4]

Unlike in the developing countries, in the developed countries there is a preponderance of available diagnostic tools. Most of the authors would regard CT scan, laparoscopy, diagnostic peritoneal lavage and abdominal ultrasonography

as key tools in the evaluation of patients with blunt abdominal trauma.^[5,6]

Subjects and Methods

We have admitted 120 abdominal injury patients in emergency surgery department out of these 120, 95 are due to blunt injury abdomen 25 are due to penetrating injury.

Table 1: of abdominal injuries in different age groups.

S.no	Age group	Blunt abdominal injury	Penetrating type
1	20-29yrs	15(15.7%)	7(28%)
2	30-39yrs	31(32.6%)	8(32%)
3	40-49yrs	23(24.21%)	4(16%)
4	50-59yrs	15(15.78%)	3(12%)
5	Above 60yrs	11(11.51%)	3(12%)

Results

The most common age group in both types of abdominal injuries, blunt injury and penetrating injury are 30 to 50 years. That is most active age group. The organs injured are liver, kidney, bowel, spleen, and omentum. Most common cause for injuries are motor vehicle accidents; fall from height because the people who are in active age group moves one place to other or they travel by cars, motorcycles etc.

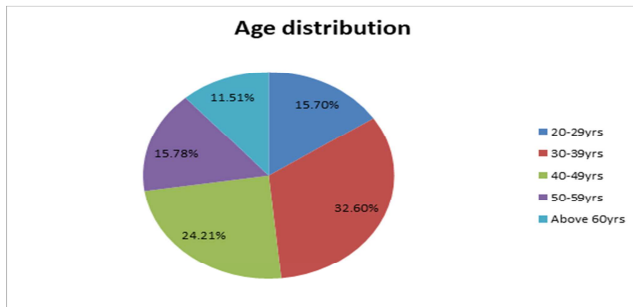


Figure 1: Age Distribution.

Table 2: Different organ injuries

S.No	Organ Injured	No. of patients injured
1	Liver	30(30.84%)
2	Spleen	14(14.84%)
3	Bowel	13(13.68%)
4	Omentum	13(13.68%)
5	Kidney	9(9.47%)
6	Others	8(8.42%)

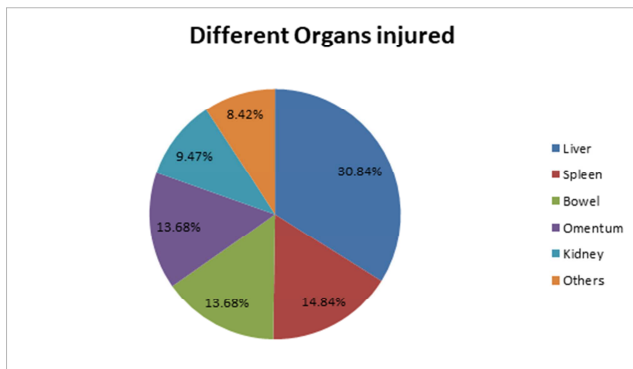


Figure 2: Organs Injured.

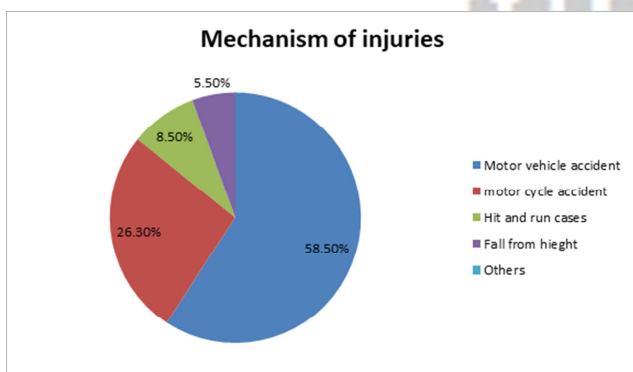


Figure 3: Motor vehicle accident cars and motorcycles etc.

Discussion

Ultrasonography is very much useful investigation in abdominal injuries especially blunt injuries. It is decrease morbidity and mortality in conditions like deep lacerated liver injury, splenic rupture, hemoperitoneum.

All patients had routine resuscitation and treatment in the emergency treatment includes maintenance of air way with control of cervical spine, ensuring adequate breathing and

maintained of circulation with IV fluids including blood transfusion in severe hemorrhage

Ultrasonography is ready available, accessible and it is a non-invasive procedure with high patient's acceptability. However the ultrasound results are operator dependent. This may alter the reliability of ultrasound in the abdominal trauma. In our study the ultra sound scan were carried out mostly by qualified radiologists only.

In our study the sensitivity of ultrasound scan for detecting intra-abdominal injury when scanning for hemoperitoneum is very good at 95% and the study conducted by yoshii et al.^[7]

Shows almost similar results 96.5%. In the retrospective study carried out on 2693 patients by Brown et al.^[8]

The sensitivity was reported at 85% which is having is lower than 95% found in this study. In our study 73 Patients (76.84%) had intra-abdominal fluid 69 patients (72.12%) has correctly identified remaining 4 patients (4.21%) had positive DPL diagnostic paritoned lavage).

This may be probably due to volume of collection was smaller than could have been detected sonographically challenges encountered in course of US imaging in this study included the limitation of sonographic window when patients had skin abrasion and dressing on aturor abdominal wall there was also a limited seen for manunring the injured patients due to pain.

When ultrasonogram was done for organ damage the sensitivity was 69.95% In the surgery organ injury is noted in 85 patients 86.78% but sonographically it is 70 patients 69.95% hemoperitoneum was diagnosed acurately. In injury to spleen 3 cases were missed sonographically. In bowel injuries 4 cases were not detected.

False negative and false positive cases which were noted in our study were nearer to the similar results which were shown by other authors.^[9,10]

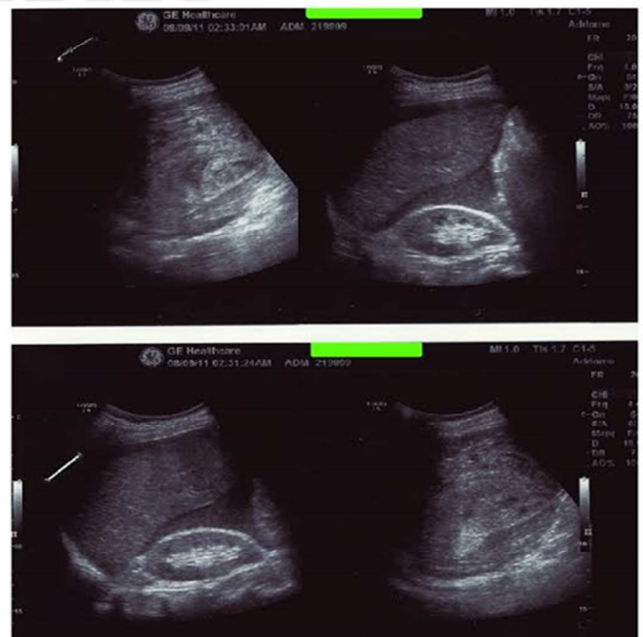


Figure 4: Abdominal Ultrasonography shoing the spleen rupture with hemoperitoneum.

The pattern of visceral injury in our study shows that 85 patients had organ (86.25%) injury 26 patients has multiple organ injury. In multiple organ injury liver, spleen were injured commonly.

Conclusion

Ultrasonography is very much useful in diagnosis of abdominal injuries scanning for presence of free intraperitoneal fluid yielded better results than scanning for visceral parenchymal injury. In rural part of India, still diagnostic facilities like ultrasonography and CT scan has to be improved to reduce the morbidity and mortality due to abdominal injuries.

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