



AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: <http://www.ajptr.com/>

Hospitals Comparison in Radiology Department By Using Ultrasound Device

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ABSTRACT

The study of device in terms of composition and physical principles, technical such as the use of one-dimensional ultrasound. The technology currently used is two-dimensional and modern technology, such as taking samples by guidance technique .Then established a statistical comparison between two hospitals in different cities same country, in terms of the number of cases for each month from January to July 2019. Statistics were created then represented on the graph by combining Excel and Word.

Keywords: Two hospitals, comparison, statistical analysis.

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Received 01 March 2020, Accepted 22 March 2020

Please cite this article as: Ali LM *et al.*, Hospitals Comparison in Radiology Department By Using Ultrasound Device. American Journal of PharmTech Research 2020.

INTRODUCTION

Sound can propagate through a medium such as air, liquid and solids as longitudinal waves. Ultrasound is sound waves with frequencies higher than (20 kilo Hertz). Ultrasound device makes images so that organs inside the body can be examined. The device sends out high-frequency sound waves, which reflect off body structures ^{[1][2]}

The ultrasound device consists of: Transducer (probe), Central processing unit (CPU), transducer pulse controls, Keyboard, Disk storage device (hard, floppy, CD), printer, monitor, control Panel. The transducer (probe) is the main part of the ultrasound device, makes the sound waves and receives the echoes and probes come in many shapes and sizes. The shape of the probe determines its field of view, and the frequency of emitted sound waves determines how deep the sound waves penetrate and the resolution of the image(The higher the frequency, the better the resolution and the worse the penetration).^{[3][4]}

Image matrix refers to a layout of cells in rows and columns each cell corresponds to a specific location in the image. Most imaging systems provide image sizes of (256,256), (512, 512), and (1024, 1024) matrices, image resolution will be better with a larger image matrix.^[5]

MATERIALS AND METHOD

This study was carried out in radiology department in Al-Thawra hospital / Al-Bayda city and Al-Hreash hospital / Derna city. Libya. The subject of the study was about 6107 and 3660 cases respectively of different ages and genders in Al-Bayda and Al-Hreash hospitals. The position of the patient: Supine position is the initial step to start normal abdominal and pelvic examination, to visualize pancreas patient should take a deep breath, gall bladder and common bile duct (CBD) ask patient left lateral decubitus position. To visualize kidneys patient should take deep breath and left or right decubitus position. In case of breast examination supine position, patient rolls slightly to spread the breast, elevate the side being scanned with a wedge under the shoulder, ipsilateral raising of the arm over the patient's head. In case of thyroid gland examination without pillow, extension of the patient's neck, rotation of the head to the left or right in case of carotid (vascular) Doppler examination .

Patient preparation for ideal ultrasound examination: generally gases, obesity and meals (breakfast), caused difficult examination. Therefore patient should be fasting, taken a medicine a day before examination to eliminate any bowel gases. Urinary bladder should be full to visualize prostate, uterus, ovaries, or any pelvic lesion.

Statistical analysis

Most cases were females, examination on the abdomen and pelvis, then the neck , few Doppler, and breast cases due to lack of radiologists , lack of interest in the radiology department in Derna, unlike Al-Bayda , most cases were females, on the abdomen , pelvis followed by the neck, Doppler, and breasts .

RESULTS AND DISCUSSION

Total (9767) cases selected from both hospitals for different genders , during seven months, Al-Thawra hospital / Al-Bayda city and Al- Hreash hospital / Derna city. Libya. Ratio of females greater than as males in both hospitals.

Statistics:

A comparison between Al-Thawra Hospital and Al-Hreash Hospital. Libya from January to July for year 2019. In general, most cases were Females, at a rate of 55.6 % over seven months period. Most cases were abdomen and pelvis.

Table 1: Total cases from January to July 2019 Al-Thawra hospital in Al-Bayda city .

From January to July 2019	Abdomen and pelvis	Neck	Breast	Vascular	Total
January	772	57	29	31	889
February	683	48	36	37	804
March	896	70	53	51	1070
April	910	90	32	30	1062
May	700	20	12	6	738
June	877	61	17	21	976
July	497	33	15	23	568
Total	5335	379	194	199	6107

Table 2 Total cases from January to July 2019 Al-Hreash hospital in Derna city.

From January to July 2019	Abdomen and pelvis	Neck	Breast	Vascular	Total
January	386	5	3	2	396
February	272	5	1	0	278
March	522	5	1	0	528
April	685	3	0	0	688
May	524	0	0	0	524
June	545	0	0	0	545
July	690	5	6	0	701
Total	3624	23	11	2	3660

Table 3 Percentages of diagnosed organs for seven months cases Al-Thawra hospital.

Organ diagnose	Total	Percentage
Abdomen and pelvis	5335	87.35%
Neck	379	6.21%
Breast	194	3.18%
Vascular	199	3.26%
Total	6107	100%

Table 4: Percentages of diagnosed organs for seven months cases Al-Hreash hospital.

Organ diagnose	Total	Percentage
Abdomen and pelvis	3624	99%
Neck	23	0.63%
Breast	11	0.303%
Vascular	2	0.067%
Total	3660	100%

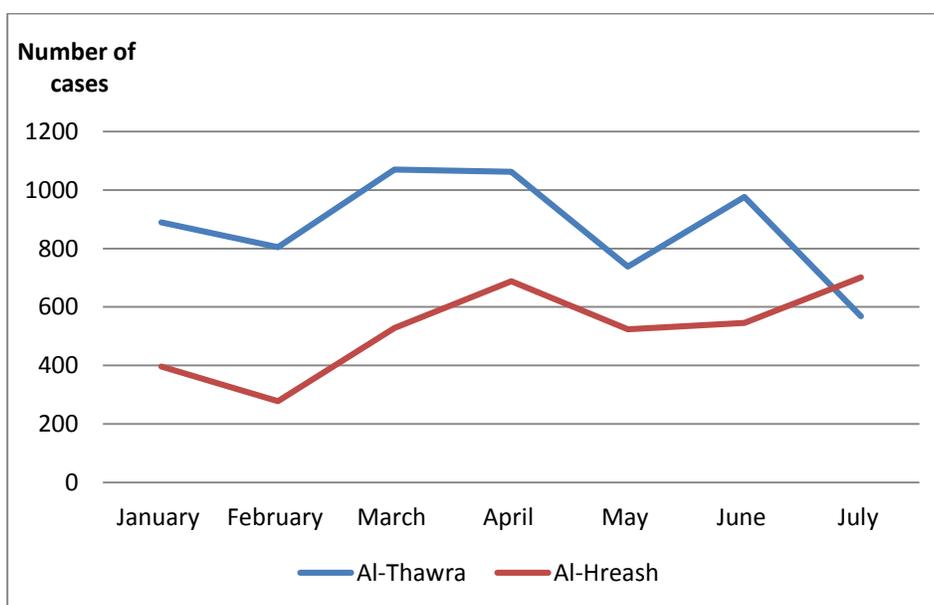
Table 5: Percentages of total cases by gender Al-Thawra Hospital.

All cases	Total	Percentage
Female	3326	54.46%
Male	2781	45.53%

Table 6: Percentages of total cases by gender Al-Hreash hospital.

All cases	Total	Percentage
Female	2110	57.65%
Male	1550	42.34%

The diagram was drawn between the numbers of cases for each month from the selected data of both hospitals as shown in Figure 1.

**Figure 1: According to the total number of cases during each month as shown in Tables 1 & 2.**

The data selected from tables 3 and 4 to draw the diagram for the most diagnosed organ, showed that the abdomen and pelvis is the most percentages for both hospitals Al-Thawra .Al-Hreash (87.35% , 99%) respectively as shown in Figure 2 .

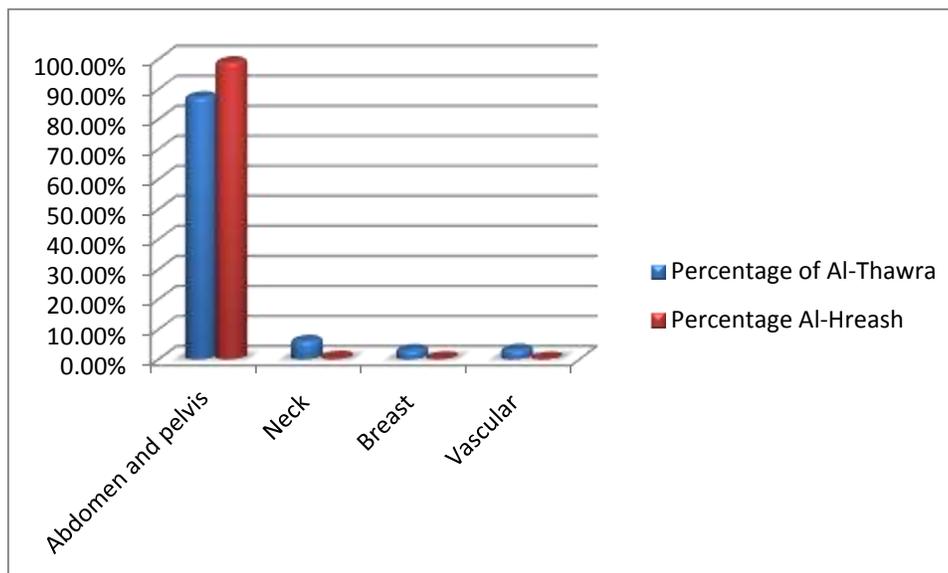


Figure 2: According to the most diagnosed organs within seven months, as shown in tables 3 & 4

The study also showed from tables 5 & 6 that the most cases were females came to the department of radiology Al-Thawra . Al-Hreash by (54.46% , 57.65%) respectively as shown in Figure 3 .

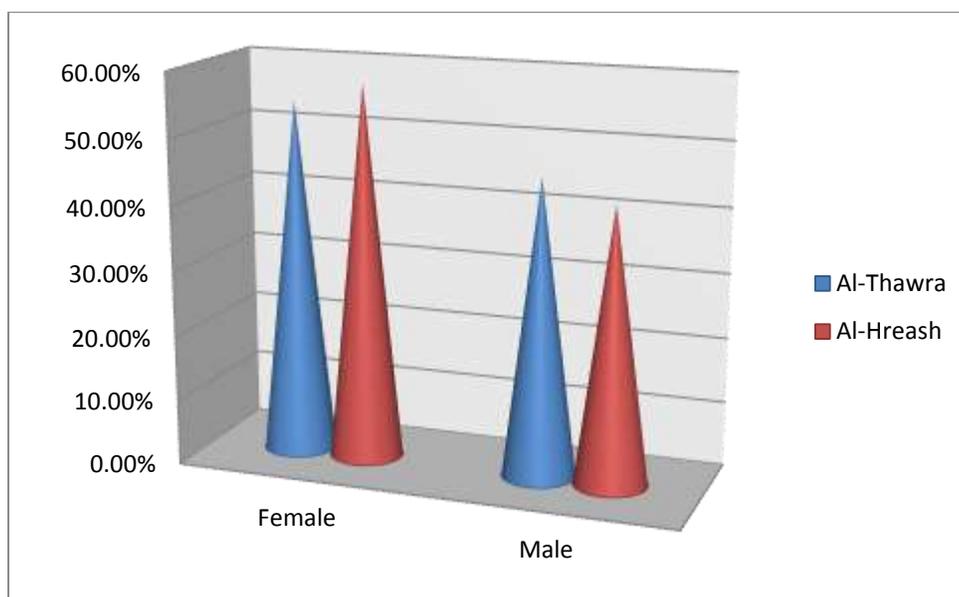


Figure 3: According to the most cases by gender, as shown in tables 5 & 6.

CONCLUSION

Attention should be better to the radiology department in the city of Derna. and Explain the importance of the radiology department in the medical field .Urgent and important to use the latest modern technologies and provide the latest developed advanced ultrasound devices in order to reduce the need of ionizing radiation devices as far as possible .

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