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# From the Editor



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This is the third issue this year which is rich with a number of papers dealing with various topics from all over the world

**A** paper from Iran looked at determination of pulmonary to systemic blood flow ratio in atrial septal defect: a comparison between echocardiography and angiocardiology. The study took place at the pediatric ward of Shahid Rajaie heart center in Tehran, Iran. Doppler echocardiography performed for all the children with ASD secundum who required angiocardiology during a two years period. The authors concluded that the simple noninvasive Doppler calculation of the Qp: Qs ratio which requires less time and no special facilities provides an excellent estimation of the Qp: QP/ Qs ratio in children with ASD secundum.

**A** prospective audit from Jordan attempted to find out if hydrocortisone injection in the wound and removing all surgical drains on the 3rd postoperative day, irrespective of volume drained, would have a detrimental effect on seroma incidence .

**A**I-Jamal MA et al carried out a survey of 104 patients to evaluate the prevalence of hepatitis C virus antibodies in hemodialysis patients, to try to identify the potential risk factors, and to suggest the possible measures which may decrease the risk of this infection. The study strongly suggest the role of nosocomial transmission of infection, making more strict and continuous adherence to infection control precautions in HD setting, surgical rooms, and blood donation system, as a first priority.

**A** paper from Nigeria was designed to review the results of cervical cytology performed at the Federal Medical Centre Owo, Nigeria within a three year period. A total of 403 women were screened between December 2007 and November 2010. The authors concluded that the benefits of Pap smear is no longer in doubt as evidence showed reduce cervical cancer death in nations that have programmed cervical screening. Our study showed that abnormal smear increases with increasing age, hence corroborating the importance of continuous screening.

**A**I-Bedirat A et al used an observational studies to find out the prevalence of hypertensive retinopathy among hypertensive patients in Prince Zaid bin Al-Hussein. The authors concluded that prevalence of hypertensive retinopathy is quite high in our region, that result from uncontrolled hypertension, seen in both sexes and almost in all age groups. It increases with duration of the disease, age, and higher in patient who are taking drugs combination.

**A** paper from Rafiq I. Haddad, and Mohamad Shaker Khasawneh, Jordan, evaluates the role of abdominal ultrasonography and computed tomography in patients with blunt abdominal trauma and to compare their results with the operative findings and clinical outcome of patients with blunt abdominal trauma. The authors conclude that ultrasonography is inferior to computed tomography in detecting visceral injury and effective as computed tomography in detecting haemoperitoneum.

# Determination of pulmonary to systemic blood flow ratio in atrial septal defect: a comparison between echocardiography and angiocardiology

## ABSTRACT

**Background:** Using Doppler echocardiography, one can reasonably determine the ratio of pulmonary (Qp) to systemic (Qs) blood flow in left to right shunts including atrial septal defect (ASD).

**Objective:** Our aim was to evaluate the Qp:Qs ratio in a group of children, and compare the above parameter with Qp:Qs measurement by angiocardiology in those patients.

**Setting:** Pediatric ward of Shahid Rajaie heart center in Tehran, Iran.

**Methods and Materials:** Doppler echocardiography performed for all the children with ASD secundum who required angiocardiology during a two years period. The Qp:Qs ratio was measured by these two techniques and the results were compared.

**Results:** There were 78 cases, 55 were female and 23 were male (F/M = 2.4:1).

The most common age group was 4-10 years old (43.6%). Echocardiography missed two cases of ASD. Sensitivity of echocardiography for diagnosis of ASD was 98%, and the positive predictive value was 100%. There was no significant difference between the Qp:Qs calculation by angiocardiology and by echocardiography. The Qp:Qs ratio by angiocardiology ranged from 1.5:1 to 4.5:1 with a mean of 2.16 $\pm$ 0.58 versus the Qp:Qs ratio by echocardiography ranged from 1.3:1 to 4.3:1 (P = 0.18).

**Conclusion:** The simple noninvasive Doppler calculation of the Qp:Qs ratio which requires less time and no special facilities provides an excellent estimation of the Qp:Qs ratio in children with ASD secundum.

**Key Words:** Atrial septal defect, Qp:Qs, Echocardiography

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### Introduction

Atrial septal defect (ASD) in the region of the fossa ovalis is the most common form of ASD and is associated with structurally normal AV valves. Secundum ASDs represent 6 to 10% of all cardiac anomalies and are more frequent in females than males by about 2:1 to 3:1. With large defects, the ratio of pulmonary to systemic blood flow (Qp:Qs) is usually between 2:1 to 4:1 (1). The degree of left to right shunting is dependent on the size of the defect, the relative compliance of the right ventricle, and the relative vascular resistance in the pulmonary and systemic circulations. Left to right shunting at the atrial level has a characteristic flow pattern that can be demonstrated by pulsed Doppler echo. Using Doppler technology, one can reasonably determine the ratio of Qp to Qs blood flow. Color flow imaging permits visualization of volumes of blood moving within the cardiac chamber and allows the blood traversing an ASD to be demonstrated (1).

Doppler echocardiography enables the possibility of determining pulmonary to systemic flow ratios in patients with left to right shunts. Volume flow is calculated as the product of mean velocity over time and the cross sectional area through which the flow passes. In the presence of an atrial or ventricular septal defect, the flow in the ascending aorta normally serves as systemic flow. The pulmonary flow is normally derived in the region of the pulmonary artery (2).

The purpose of the present study was to determine the Qp:Qs in a group of patients with ASD secundum by Doppler echocardiography. We compared the above findings with Qp:Qs measurement by cardiac catheterization and angiography in the same patients. We wanted to assess the correlation between the calculation of Qp:Qs by these two methods.

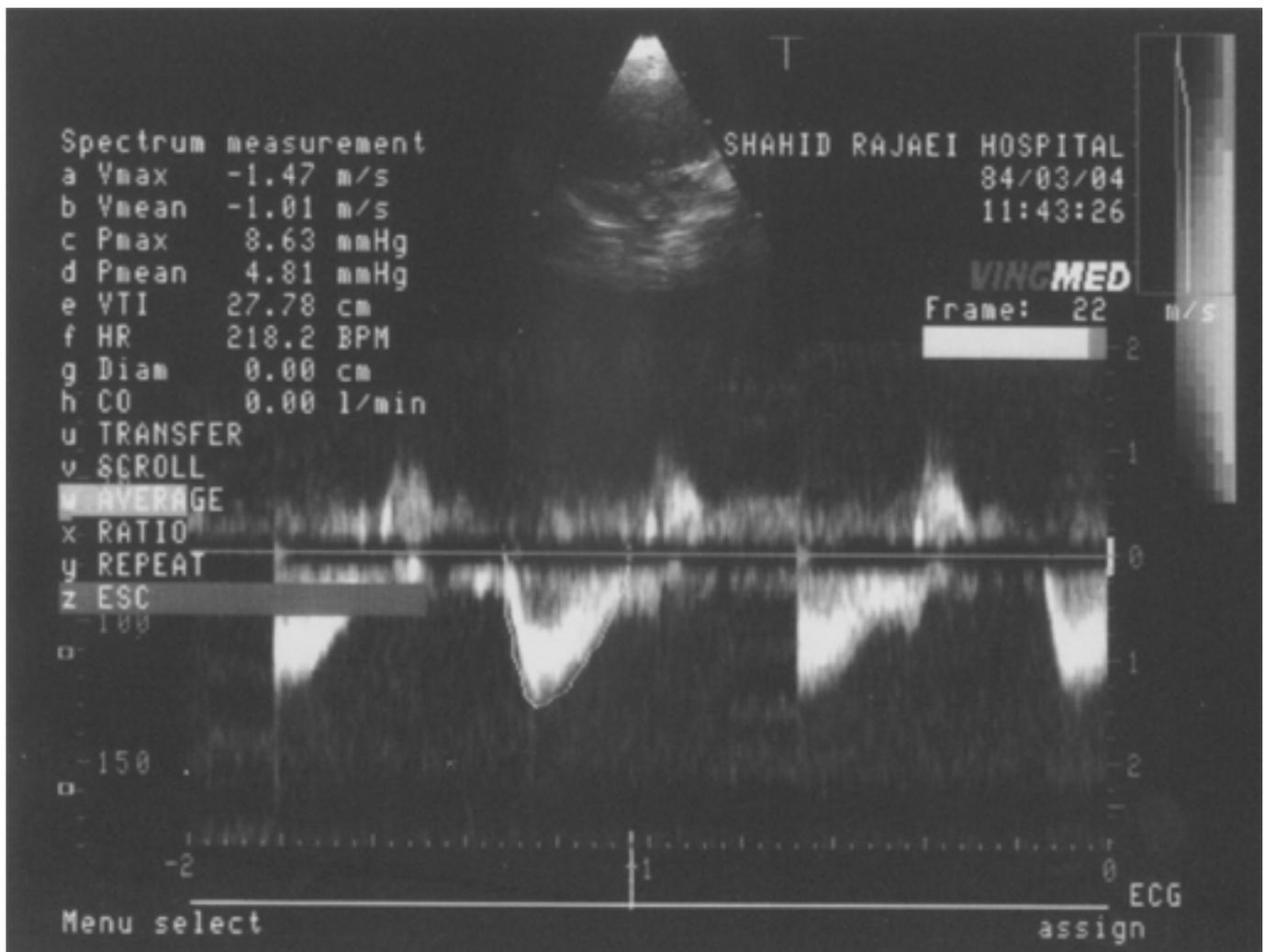


Figure 1: Measurement of aortic velocity time interval

## Methods and Materials

During a period of two years 78 children with ASD secundum underwent trans thoracic Doppler - echocardiography and cardiac catheterization in order to assess pulmonary blood flow, systemic blood flow, and the size of defect. The following method was applied for Qp: Qs measurement by Doppler-echo.

$$Qp: Qs = VTI_{PA} \times D_{PA}^2 / VTI_{AO} \times D_{AO}^2$$

VTI represents velocity time interval, D : Diameter, QP : pulmonary flow, QS: systemic flow, Ao: Aorta, and PA : pulmonary artery. Five-chamber view was obtained for demonstration of aortic ring or annulus. The flow that passes through the aorta was registered. The curve of velocity was inscribed manually, and this parameter represents VTI of AO (Figure 1). After demonstration of aortic root in parasternal long axis view, the internal diameter of aorta was measured. The above parameter represents D AO (Figure 2 opposite page). Each of the above assessments was repeated for three consecutive beats and the mean of 3 measurements was calculated. The systemic flow or Qs was obtained by the following equation:  $QS = VTI_{AO} \times D_{AO}^2$ .

For determination of pulmonary velocity time interval, parasternal short axis view was obtained. After appearance of the pulmonary valve, the flow that passes through the valve was registered, and its curve of velocity was inscribed manually. This parameter represents VTI Pa (Figure 3 page 6). Then the diameter between the two end points of pulmonary annulus was measured. These parameters represent D Pa (Figure 4 page 7). Each of the above assessments was repeated for 3 consecutive beats and the mean of 3 measurements was calculated.

The pulmonary flow or Qp was obtained as follows:

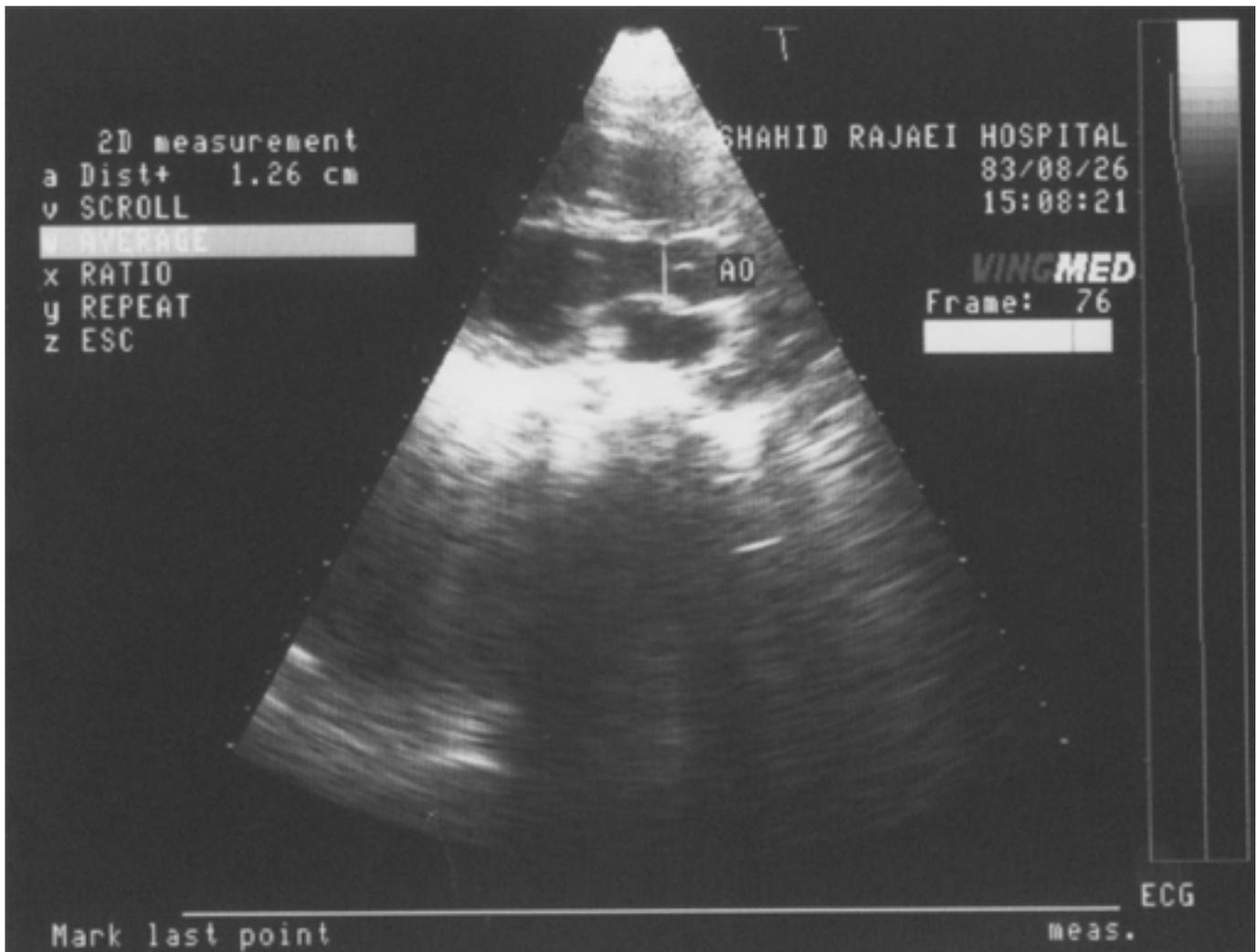
$$QP = VTI_{PA} \times D_{PA}^2$$

The QP:QS at the catheterization laboratory was determined by the following Equation:

$$Qp: Qs = \frac{PV O_2sat - PA O_2sat}{AO O_2sat - SVC O_2sat}$$

PV O<sub>2</sub>sat = pulmonary venous oxygen saturation.

PA O<sub>2</sub>sat = pulmonary artery oxygen saturation.



**Figure 2: Measurement of aortic diameter**

AO O<sub>2</sub>sat = aortic oxygen saturation.

SVC O<sub>2</sub> sat = superior vena cava oxygen saturation.

The Qp:Qs measured by echocardiography were compared with the Qp:Qs measured by catheterization. T student test was used for comparison, and P value < 0.05 was considered significant.

## Results

During a period of 2 years (2006-2008) 78 cases of ASD secundum were admitted at the pediatric cardiology ward of Shahid Rajaie Heart Hospital in Tehran, Iran. All the patients underwent cardiac catheterization and angiocardiography. Color Doppler echocardiographies were performed for all these patients and the Qp:Qs ratios were calculated by this technique as well as by catheterization. Twenty-three were male and 55 were female. F/M ratio was 2.4:1. The distribution of patients' age group were as follows: less than 1 year 7 cases (8.9%), 1 -< 4 yr 21 (26.9%), 4 - 10 yr 34 (43.6%), and > 10 yr 16 cases (20.6%). Echocardiographic examination failed to diagnose 2 cases of ASD. Sensitivity of echocardiography for diagnosis of ASD was 98%. The positive predictive value of this test was 100%. All the 78 cases had ASD by angiocardiography, and there was not any true negative result. The Qp:Qs ratio obtained at

cardiac catheterization ranged from 1.5:1 to 4.5:1 with a mean of  $2.16 \pm 0.58$ . The Qp:Qs ratio calculated by Doppler echocardiography ranged from 1.3:1 to 4.3:1 with a mean of  $1.99 \pm 0.64$ . There was no significant difference between the Qp:Qs calculation by the two methods (P= 0.18).

The size of ASD measured by echocardiography ranged from 0.72 cm to 3.9 cm with a mean of  $1.83 \pm 0.69$  cm. We did not find significant difference between catheterization and echocardiography for measurement of ASD size.

## Discussion

The purpose of the present study was to verify the value of two-dimensional pulsed Doppler echocardiographic method for measurement of Qp and Qs in comparison with angiocardiography in patients with ASD. Systemic flow was evaluated at the aortic orifice, and pulmonary flow was measured by the site of insertion of the pulmonary cusps. In our series seventy-eight (78) patients with ASD underwent Doppler echocardiography and cardiac catheterization in order to assess Qp:Qs ratio and the size of defect. We found out that there was no significant difference in measurements with these two techniques, and echocardiography is a useful non-invasive method in order to evaluate intra cardiac shunts. De Simone et al studied 28 patients (mean age  $22 \pm 14$  year) with ASD or VSD who underwent Doppler echo and cardiac

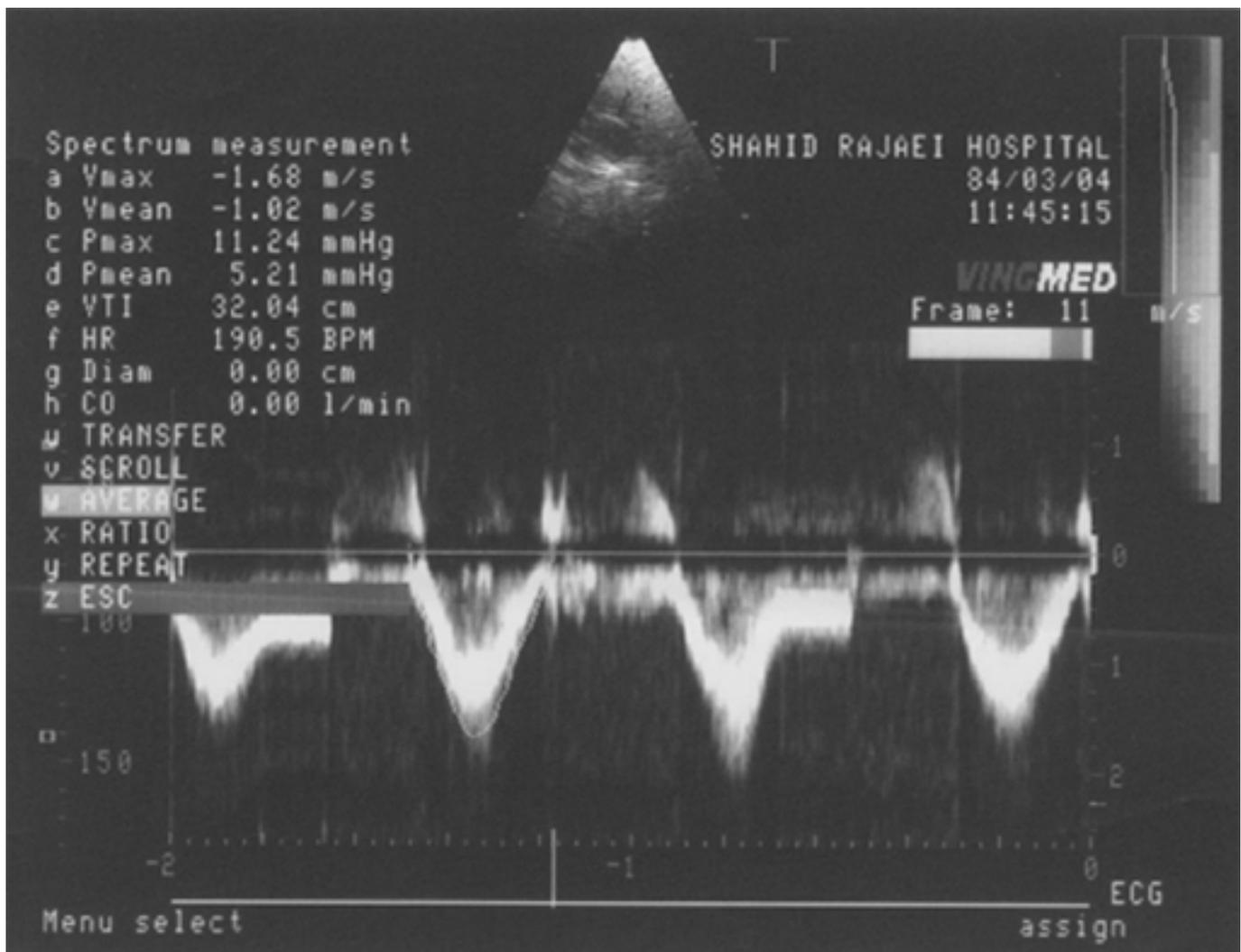


Figure 3: Measurement of pulmonary artery velocity time interval

catheterization to assess Qp:Qs. They concluded that Doppler echo is a useful non-invasive tool for evaluation of intra cardiac shunts (3). In a study by Forfar et al, 40 consecutive patients were evaluated for an isolated left to right shunt at atrial level.

Echocardiography had high sensitivity and specificity for diagnosis of ASD and provides quantitative information about the defect's diameter (4).

Another study by Cloez et al reported 27 children with left to right shunt at atrial or ventricular level who underwent echo-Doppler and catheterization examination. The Doppler Qp:Qs ratios correlated well with catheterization Qp:Qs ratios ( $r = 0.94$  and  $0.93$  respectively), and the Qp:Qs ratios ranged from 1.4: 1 to 4.3: 1. They concluded that the simplified Doppler calculation of the Qp:Qs ratio which requires less time provided an excellent estimate of the Qp:Qs in children (5). The purpose of a study by Kokos et al in Zagreb was to verify the value of 2-D pulsed Doppler echocardiographic method for measurement of Qp:Qs in comparison with catheterization in a group of patients with VSD and ASD. They reviewed 42 children with VSD and 23 children with ASD. The correlation coefficient for children with ASD and those with VSD amounted to  $r = 0.71$  and  $r = 0.81$  respectively. The authors

concluded that 2-D pulsed Doppler echo although a semi quantitative technique, appears to be a reliable non-invasive method for measuring Qp:Qs in patients with left to right shunts (6). In research by Minajoe et al, non-invasive pulsed Doppler echocardiography combined with two-dimensional echocardiography by transthoracic approach was performed to detect the shunt flow through the defect in 31 patients with suspected secundum ASD. A defect of the interatrial septum was seen on the two-dimensional echocardiogram in 30 of 31 patients. Cardiac catheterization indicated significant shunt flow in all the 31 patients with suspected ASD, and the Qp:Qs ratio was fairly well correlated with Doppler - determined left to right shunt flow velocity ( $r = 71$ ) (7).

According to our data Doppler echocardiography revealed ASD in 76 out of 78 cases, and there was no significant difference between the two methods for measuring Qp:Qs. According to a report by Venzetto et al in France, 15 children with ASD secundum underwent Doppler echo evaluation of Qp:Qs ratio. The values obtained were compared with cardiac catheterization findings. The feasibility of the Doppler investigation was 100 percent. Correlation between the two techniques was 85%. They concluded that Doppler echo appears to be a reliable and reproducible method for the evaluation of left to right shunts, confirming data from the literature (8).

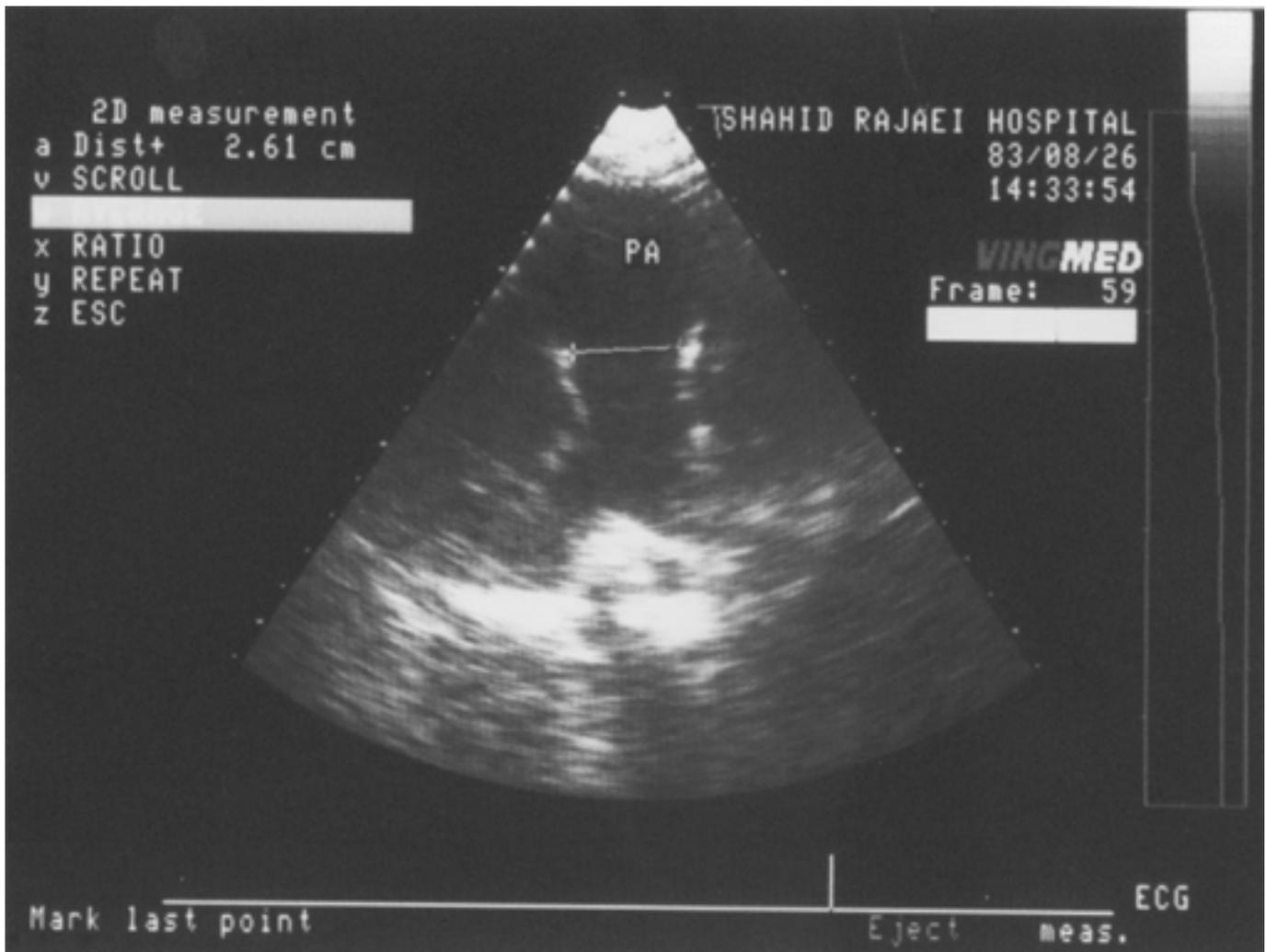


Figure 4: Measurement of pulmonary artery diameter

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# Postoperative hydrocortisone wound injection and seroma incidence in breast surgery: is there a correlation?

## Background

Most breast surgical drains in patients undergoing breast surgery are removed once the 24-hour-output is less than 30 ml or on the 5th postoperative day, irrespective of volume drained. This resulted in an average seroma incidence of 30-45% and an average hospital stay of two days only.

The aims of this prospective audit are to find out if hydrocortisone injection in the wound and removing all surgical drains on the 3rd postoperative day, irrespective of volume drained, would have a detrimental effect on the seroma incidence.

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## Methods

All patients who underwent breast surgery between August 2009 and January 2010 were included in a double blind study. The following data was collected:

Age of patient, type of operation, drain volumes in the 1st, 2nd, and 3rd postoperative day, seroma incidence, number of postoperative days of seroma incidence and volumes of seroma aspirated, frequency of hydrocortisone injection, lymph node status in post surgery histopathology reports, neoadjuvant therapy incidence.

On the third day postoperatively drains are removed, and 2 ampoules of hydrocortisone diluted in distilled water injected. Each ampoule contains 100 milligrams hydrocortisone. A pressure garment is applied and the patient sent home. One week later the patient is reassessed in the clinic if >30cc aspirated reinjection of hydrocortisol took place, and the patient reassessed within a week.

## Results

### Result

Mean seroma days = 11

pv1=68.133

pv2=38.244

pv3=7.0005

R=0.151

The total number of patients was 87. All patients were discharged on the 3-4th postoperative day. The majority of these patients had 1 or 2 aspirations, while only 2 patients had 5 aspirations. The median time of seroma incidence was between 6 and 8 postoperative days. The median drained-seroma volume was 140-160ml.

74.7 % (65) of our patients needed only one injection

12.6% (11) needed a second injection.

8.04 % (7) needed a 3rd or 4th injection.

In 2.66% there was incomplete follow up of the patient.

2.03% developed a complication, or side effect from the drug injection.

Interestingly 55% of patients needed a second injection whether n2 or n3 in the histopathology report. A significant note was that the patients who needed more frequent injections i.e. failure of first and second attempt to eliminate seroma, are those who were staged as n3, or, those who received neoadjuvant therapy. (5 of our patients). (See Table 1 - next page)

## Conclusion

The seroma incidence (42.5%) did not change greatly compared with previous practice (30-45%). There was a considerable decrease in mean seroma days from 3 weeks to 11 days. Number of bed days was reduced and most importantly the patients were hugely satisfied with the new practice and earlier initiation of chemo radiotherapy protocol. Following these results the previous practice has been changed and the following implementations have been introduced as best clinical practice: all surgical drains in breast surgery should be removed on the 2-3rd postoperative day irrespective of volume drained.

## Discussion

Breast cancer is the second leading cause of cancer death among women. The surgical treatment of choice for these patients is either modified radical mastectomy or breast preservation depending upon stage of the disease. Seroma formation is the most frequent postoperative complication

Percentage	Patient numbers	Injection attempts
75%	65	1
12.6%	11	2
8.04%	7	>2
2.66%	Lost to follow up	
2.03%	Developed complications	

Table 1

after breast cancer surgery. It occurs in most patients after mastectomy and is now increasingly being considered a side effect of surgery rather than a complication however, all patients are not clinically symptomatic. Seroma is defined as a serous fluid collection that develops under the skin flaps during mastectomy or in the axillary dead space after axillary dissection. Incidence of seroma formation after breast surgery varies between 2.5% and 51%. Although seroma is not life threatening, it can lead to significant morbidity (e.g. flap necrosis, wound dehiscence, predisposes to sepsis, prolonged recovery period, multiple physician visits) and may delay adjuvant therapy. Fluid collection is ideally managed by repeated needle aspiration to seal the skin flaps against the chest wall. Several factors have been investigated as the cause of seroma formation. These include age, duration of wound drainage, use of pressure garment, postoperative arm activity, preoperative chemotherapy, and use of electrocautery. The present study was undertaken to identify risk-factors associated with seroma formation after breast cancer surgery.

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# Cervical Cancer Screening at a Rural Tertiary Institution in Nigeria

## ABSTRACT

**Objective:** This study was designed to review the results of cervical cytology performed at the Federal Medical Centre Owo, Nigeria, within a three year period.

**Material and methods:** 403 women were screened between December 2007 and November 2010. The patients were enrolled and screened at Federal Medical Centre Owo, Nigeria. The subjects were patients attending the gynecology clinic of the hospital, patients being prepared for gynecological surgery and patients referred by the family physicians.

**Results:** The ages of the patients ranged between 18 and 88 years. The mean age was 45.9 years and mean parity was 3.5 (0-15). The majority of the women were in active reproductive age group and 27% were menopausal. Most of the women 313(78.2%) had no epithelial abnormality. Epithelial abnormalities were seen in 90(21.8%) women. These included : atypical squamous cell of undetermined significance (ASCUS); 43(10.7%), Low grade Squamous Intraepithelial Lesion (LSIL);14(3.5.0% ), High grade Squamous Intraepithelial Lesion (H-SIL); 15(3.7%) and squamous cell carcinoma; 6(1.5%). Atypical endocervical cells; 11(2.7%) and adenocarcinoma; 1(0.2%). Intraepithelial lesion was most predominant in age group 41-50 years, with ASCUS as the most frequent lesion. The youngest patient with cervical cancer was 30 years while the oldest was 87 years.

**Conclusion:** Benefits of Pap smear are no longer in doubt as evidence showed reduced cervical cancer death in nations that have programmed cervical screening. Our study showed that abnormal smear increases with increasing age, hence corroborating the importance of continuous screening.

**Key words:** Cervical, Cancer, Screening, Women, Nigeria

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### Introduction

Invasive cervical cancer is a leading cause of cancer-related deaths among women worldwide. (1,2,3) About 500,000 new cases are diagnosed every year in the world with approximately 85% of deaths occurring in developing countries of the world(1). Cervical cancer is a major public health problem for women in low-and middle-income countries.(1,4) Many studies have shown that population-based cytological screening and early treatment do reduce morbidity and mortality associated with cervical cancer as evident in countries where screening is readily available and widely utilized. (5,6,7) However, cervical cancer has remained a major reproductive health problem in Nigeria and other developing countries where cervical cancer screening services are either not readily available or poorly utilized. (8,9,10)

Cervical cancer is amenable to screening because it has a long pre-clinical phase with precursor lesions that can be identified and treated using simple outpatient procedures.(11). Major barriers to cervical cancer screening include lack of awareness, inadequate knowledge, and limited access to health professionals and cost of the test.(10)

The objective of this study was to review the results of cervical cytology performed at the Federal Medical Centre Owo, Nigeria within a three year period.

## Materials and Methods

The subjects were screened between December 2007 and November 2010.

The patients were enrolled at Federal Medical Centre Owo, Nigeria. These were patients attending the gynecology clinic of the hospital, patients being prepared for gynecological surgery and patients referred by the Family physicians.

Cervical smears were taken and prepared either by the conventional method or liquid cytology. The smears were done using Cervexbrush®. cervical cell sampler or a combination of Ayres spatula and endocervical brush. The sampler was introduced into the cervix and the squamocolumnar junction scraped by a 360 degree rotatory movement. This was then applied to a glass slide and fixed immediately in 95% alcohol or by a fixative spray. For liquid cytology the sampler was dropped in the fixative provided. Smears were transported to the laboratory for routine Papanicolau stains.

The smear results were classified according to The Bethesda system for reporting cervical/vaginal cytological diagnoses(12).

The data obtained were analyzed using simple descriptive methods and inferential statistics where applicable.

## Results

A total of 403 women were screened. Their mean age was 45.9 years (18-88years). The mean parity was 3.5 (0-15). The majority of the women were in the active reproductive age group (21-50 years); 27% were menopausal. Contraceptive prevalence amongst the women was (40.7% ); many [22.1%] were previously or currently on an intra uterine contraceptive device (IUCD). Table 1 shows age distribution of the patients.

Age group	Number of patients
11-20	1 (0.2)
21-30	28 (6.9)
31-40	103 (25.6)
41-50	153 (38.0)
51-60	74 (18.4)
61-70	27 (6.7)
71-80	6 (1.5)
81-90	3 (0.7)
Unspecified	8 (2.0)
<b>Total</b>	<b>403 (100.0)</b>

**Table 1: Age distribution of patients**

Most of the women 313 (77.6%) had no intraepithelial abnormality. Of this category 168 (53.7%) had inflammatory smears. Only 7.1% (12) of women with inflammatory smear had a specific organism recognized cytologically. This included shift of flora consistent with Gardnerella vaginalis 2.9%, Trichomonas vaginalis 1.8%, fungal organism consistent

with Cadida species 1.2%. Actinomycetes-like organisms and microfilaria worms were seen in a patient each; these women were on IUCD for more than five years.

Others were mainly non-specific inflammatory reactions. 43 out of 89 [48.3 %] women on IUCD had an inflammatory smear.

Epithelial abnormalities were seen in 90 (22.4%) women. Of these, 83(20.6%) were intraepithelial lesions while 7(1.7%) were frank carcinoma cytologically.

The intraepithelial lesions included: atypical squamous cell of undetermined significance (ASCUS) ;43(10.7%), low grade squamous intraepithelial lesion (LSIL) 14 (3.5.0%), high grade squamous intraepithelial lesion (H-SIL); 15(3.7%). Atypical endocervical cells; 11(2.7%), of these six were neoplastic while five were “not otherwise specified” (NOS).

Squamous cell carcinoma was seen in six patients (1.5%), while only one patient had adenocarcinoma (0.2%).

The age-specific prevalence of intraepithelial lesions is shown in Table 2 (next page).

Cervical Intraepithelial lesions (squamous and endocervical) were most predominant in the women aged 41-50 years, with ASCUS was the most preponderant lesion. LSIL was more common in women aged 31-40 years and 41-50 years. HSIL was predominant at 31-40 years. Endocervical lesions were also predominant within the 41-50 year group. The association between parity and cervical intraepithelial lesions was statistically significantly ( $p < 0.05$ ) (Figure 1, next page). Of the patients with squamous cell carcinoma half of them were less the 50 years old while the other half were above 50 years ( 30-87 years). The only patient with adenocarcinoma was a 35 year old para.

The graph demonstrates a steady rise for ASCUS ; the decline in ASCUS with parity (>4) is due to the fact that average parity is 3.5, while HSIL and LSIL peaked at parity >4 .

Thirty nine (43.3%) of the patients with epithelial abnormalities had repeat smears done at three to six months intervals; those with persistent abnormalities had colposcopy and tissue biopsy. Histological diagnosis was available in eleven patients. These included cervical intraepithelial lesion (CIN1 (4 patients), CIN2 (3 patients), CIN3+ CGIN 3 (1 patient), SCC (2 patients), and adenocarcinoma-in-situ coexisting with CIN 2 in one patient. Table 3, page 13, shows histological diagnosis in some of the patients.

Patients with inflammatory smears were treated with 600 mg of Clotrimazole (Canesten) vaginal pessaries and metronidazole (Flagyl) 200 mg three times a day for seven days.(13) Some women with non specific cervicitis were given Doxycycline 100mg twice daily for 10 days. Patients with persistent high grade lesions who had completed their families [two women] were offered total abdominal hysterectomy on account of leiomyoma, while others were

Age group	ASCUS	LISL	HSIL	AGC	Total (%)	% of smear performed in each age group
21-30	2	1	1	0	4 (4.8)	14.2
31-40	5	5	5	4	19 (22.8)	18.4
41-50	21	5	4	6	36 (43.3)	23.5
51-60	10	3	4	1	18 (21.6)	24.3
61-70	3	0	0	0	3 (3.6)	11.1
71-80	1	0	0	0	1 (1.2)	16.7
Unspecified	1	0	1	0	2 (2.4)	25
<b>Total (%)</b>	<b>43(51.8)</b>	<b>14(16.8)</b>	<b>15(18.0)</b>	<b>11(13.2)</b>	<b>83(100)</b>	

**KEY**

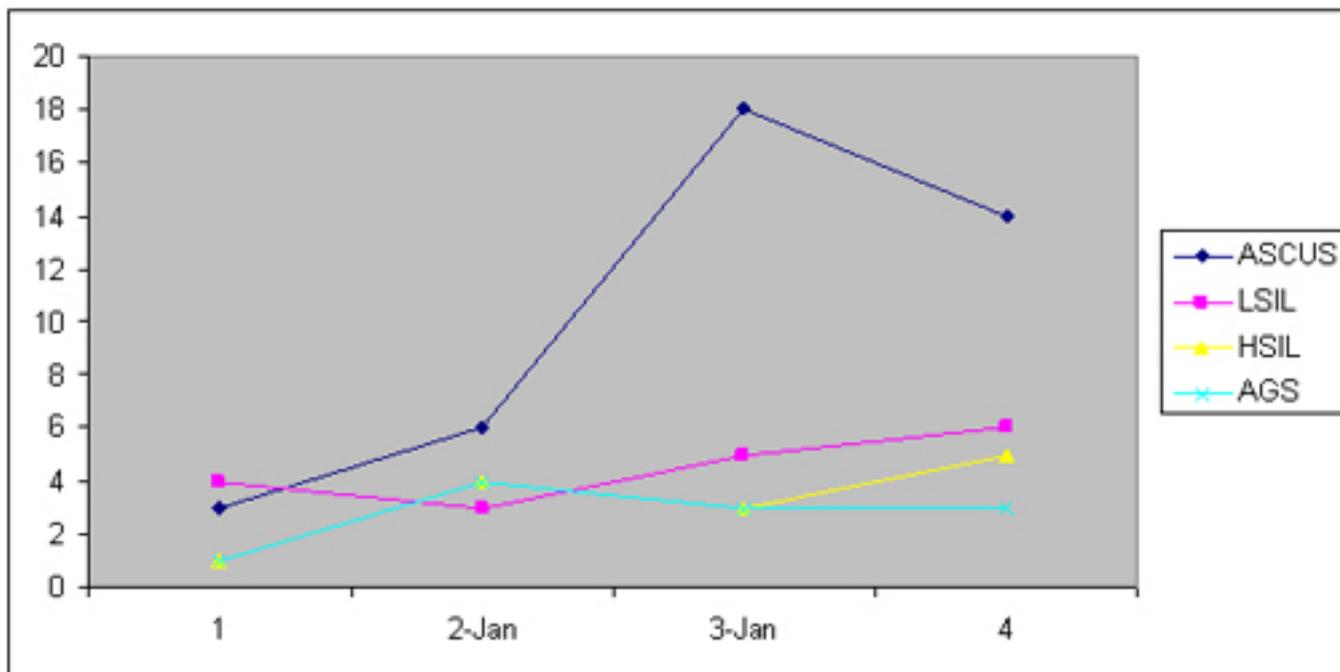
ASCUS- Atypical Squamous Cell of Undetermined Significance

LSIL- Low grade Squamous intraepithelial lesion

HSIL- High grade Squamous intraepithelial lesion

AGC -Atypical glandular cells

**Table 2: Age-specific prevalence of Cervical Intraepithelial lesions**



**Parity group**

Parity group key : 1 = para 0, 2= para 1, 3= para 2 -4, 4=para >4

**Figure 1: Shows the relationship between parity and cervical intraepithelial lesions**

offered large loop excision of the transformation zone (LLETZ) but declined. Those with histologically confirmed cervical carcinoma were referred for radiotherapy and adjuvant chemotherapy.

**Discussion**

Federal Medical Centre Owo is a tertiary health institution in Ondo state, Nigeria. It serves a population of over 3 million

people of Ondo State, also meeting the health needs of cluster groups of people from neighboring states of Kogi, Edo and Ekiti.

Women of different age groups were involved in this study with peak age group of 41-50 years. This was also the peak age group for inflammatory and abnormal smears. This age group had consistently been the most affected by cervical lesions in our environment.(8,13) World Health Organization

Patient I.D.	Cytology	Histology
1. O.K.	HSIL	Endocervical adenocarcinoma in-situ + CIN2
2. O.R	HSIL+AGC	CIN3+CGIN 3
3. R.C	?HSIL	Koilocytic atypia +CIN 1
4. M.A	AGC	Complex atypical Endometrial Hyperplasia
5. R.C	? HSIL	CIN 1, HPV Associated.
6. A.J	SCC	Infiltrating SCC
7. A.Y	ASCUS	CIN2 + HPV
8. J M	ASCUS ?Highgrade	CIN 2
9. A.B	HSIL	CIN1
10. O.C	AGC favours neoplastic	Endocervical adenocarcinoma

**Table 3: Correlation between Pap Smear [Cytology] report and Eventual Histology**

recommends that a single Pap smear in this age group will reduce incidence of cervical cancer by 50%.(14)

Most of the women with no intraepithelial lesions had an inflammatory smear. Cervical infections are common in sexually active women and women with multiple sexual partners are more likely to have sexually transmitted diseases.(15) The mean age of our study population was 45.9 years, age range of menopause in our environment is 49-51. The incidence of specific infections detected by Pap smear was only 7.1%.This could be more since bacteriological swab for culture is more ideal in diagnosing pelvic infections. The rest were non specific inflammation. Many of the women were asymptomatic for pelvic infections. High prevalence of IUCD could have accounted for the majority of inflammatory smears.

The prevalence of epithelial abnormalities from this study is 21.8% with intraepithelial lesions constituting 20.6% of the cases. This is almost similar to the incidence of 19.7% reported by Omigbodun et al in Ibadan () and 16.2 % by LS Massad et al (17). The similarity may be due to the population studied. While most of our patients were patients attending the gynaecological clinic and those referred by family physicians, Omigbodun et al studied patients from a sexually transmitted disease clinic. Reports from other centres in Nigeria however, showed much lower incidence of 6.5% and 4.8% where communities were screened.(18,19) hence hospital based incidence is higher than population/community based results. The prevalence rate of cervical intraepithelial lesion is dependent on the extent to which a population is screened.

The predominant lesion is ASCUS. This is significantly associated with increasing parity and age, accounting for 58.3% of all women in the age group of 41-50 with abnormal smear and 55.6 % of all women with abnormal smear in the age group of women of 51-60, compared with only 26.3% of women with abnormal smears in the age range of 31-40 years. The finding of ASCUS as the most common lesion is similar to the findings of Schnatz et al(18). This is not surprising

since it is the earliest cellular change observed. Adekunle et al also found a high age-specific prevalence abnormal smear in the age-group 40-49 years.(19) This demonstrates the importance of continuous screening with advancing age and re-emphasises that screening below 30 years may not be cost effective as screening women under age 25 does not decrease cancer rates before the age of 30.(20)

In the United States, about 2-3 million abnormal Pap smear results are found each year.(21) Most abnormal results are mildly abnormal (ASC-US (typically 2-5% of Pap results) or low-grade squamous intraepithelial lesion (LSIL) (about 2% of results)). In our finding ASCUS contributed 10.7 % of all abnormal smears. This is slightly less than 12.7% found by Massad et al in a similar population of women.(17) However the prevalence of LSIL 3.5% is similar to both United State's statistics and the findings of Massad et al (17).

The prevalence of HSIL [3.7%] is high compared with 0.5 % (21) and 1.2 %(17), found by other researchers. This could be explained by the fact that about half of the samples were processed by liquid based cytology which has an increased uptake for high grade abnormalities. The liquid sample has the advantage of being suitable for high-risk HPV testing and may reduce unsatisfactory specimens from 4.1% to 2.6%.(22).

Adenocarcinoma of the cervix has not been shown to be prevented by Pap tests.(21) In the UK, which has a pap smear screening program, adenocarcinoma accounts for about 15% of all cervical cancers. (23) Atypical endocervical cells were seen in 11 (2.7%) of women with abnormal smears. Of these six were neoplastic while five were "not otherwise specified" (AGC-NOS), with only one patient having adenocarcinoma (0.2%). In a study by Scheiden et al, of the 183 AGC-NOS diagnosed, 56.3% (103/183) were associated with tissue-proven precancerous and/or cancerous lesions, 44% being of endocervical and 56% of endometrial origin. (24) In our study if all women with atypical endocervical cells in pap smear had the privilege of endometrial biopsy, more endometrial abnormalities could have been diagnosed. Our yield of abnormal endocervical cells of 2.7 % as against

0.06% in a ten year review (24) could have been influenced by undiagnosed genital bleeding in some women and the use of an endocervical brush.

Frank squamous cell carcinoma was seen in six patients (1.5%). This appears to be very low for our environment with alarming cervical cancer related deaths. Pap smear was done amongst the presumed healthy population; women with visible lesions were excluded.

Though there is no national screening programme in Nigeria, there is an increase in the number of screening points in health institutions and many women are becoming aware of the disease and availing themselves of these facilities. As advocated by Dim et al routine cervical cancer counseling and screening with an opt-out option should be offered to every eligible woman attending the outpatient clinics. (25) This is very feasible as every enrollee of the National Health Insurance Scheme [NHIS] can be screened without instant payment. The non-enrolled should also be encouraged to screen.

### Conclusion

The benefits of Pap smear are no longer in doubt as evidence showed reduced cervical cancer deaths in nations that have programmed cervical screening. Our study showed that an abnormal smear result increases with increasing age, hence corroborating the importance of continuous screening. Presence of abnormal/atypical endocervical cells in Pap smears could reveal precursors of endocervical/endometrial cancers. Most women with non epithelia abnormalities had inflammatory smears; half this number had a history of intra-uterine contraceptive device use. This reinforces the need for bacteriological swabs to be done before insertion of an IUCD.

### Recommendation

Continuous screening using Pap smear is recommended, since prevalence of abnormal cytology increases with age. All women with AGUS, atypical endocervical cells should have endocervical curettage and endometrial biopsy.

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(References continued page 27)

# The Frequency of Hepatitis C Antibodies In Patients with End Stage Renal Disease. A single-center study

## ABSTRACT

**Objective:** To evaluate the prevalence of hepatitis C virus antibodies in hemodialysis patients, to try to identify the potential risk factors, and to suggest the possible measures which may decrease the risk of this infection.

**Methods:** We carried out a survey of 104 patients, who were on regular hemodialysis during the period between January and October 2010 at Prince Hashim Military Hospital (PHMH), middle region of Jordan, for the prevalence of hepatitis C virus (HCV) antibodies using third generation enzyme linked immunoassay (ELISA).

**Results:** A total of 21(20%) patients were HCV positive, of whom 11(52.3 %) were male and 10(47.7%) were female. The mean age of study participants was 50.8 years, age range 14-95 years, and the means of age in both HCV positive and HCV negative patients were 47.53 years and 55.69 years respectively.

Statistical analysis showed that history of blood transfusion, duration on hemodialysis, surgical history (including kidney transplantation) and hepatitis B infection had an important role in acquiring hepatitis C infection, while other studied risk factors which were diabetes mellitus and gender, did not show a significant role in acquiring this infection in the hemodialysis population.

**Conclusion:** The study strongly suggest the role of nosocomial transmission of infection, making the more strict and continuous adherence to infection control precautions in the HD setting, surgical rooms, and blood donation system, as a first priority.

**Keywords:** Hepatitis C Antibodies, Hemodialysis, Middle region of Jordan, Prince Hashem Military Hospital, ELISA.

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## Introduction

HCV infection is a major public health problem with an estimated worldwide prevalence of 3 % (1) leading to chronic active hepatitis in 50% of cases, and if left untreated it can progress to cirrhosis and hepatocellular carcinoma. (2,3)

Patients with chronic kidney disease (CKD), especially hemodialysis patients, are among the highest risk groups regarding exposure to hepatitis C virus, probably due to various risk factors such as impaired humeral and cellular immune systems (4), blood transfusions(5 ), using the same machine(6) and-or sharing the same room with infected patients(7), spreading risk of infected health staff in the dialysis period(8), disobeying universal rules (9 ) and using immunosuppressive drugs(10 ).

The coexistence of chronic liver disease (CLD) with CKD is an important cause of renal morbidity and mortality (11); furthermore HCV-infected HD patients are exposed to significant liver disease and decreased life expectancy (3,12,13 ) and HCV infection leads to decreased graft and patient survival in renal transplant patients (14,15). Therefore, the clinical importance of HCV has been increasingly recognized in the dialysis community.

In our country the prevalence of HCV infection is variable in different HD units ranging from 21% to50 % (16-20). The data of these studies have suggested the importance of nosocomial as well as transfusion factors in acquiring HCV infection in hemodialysis patients.

The reported data of studies held worldwide are controversial regarding the measures which can lead to lower prevalence of HCV infection in HD patients. Some studies reported that this can be achieved by the strict adherence to “Universal Precautions for Prevention of HCV Transmission” alone (21,22 ). On the other hand some other studies have reported that the use of dedicated HD machines in addition to the

above measures can significantly lower the incidence of HCV infection among the dialysis population(23,24). The aim of the present study is to assess the prevalence of HCV antibodies in the HD population at PHMH, to determine the possible risk factors, and to try to suggest preventive measures which may lead to lower prevalence of this infection.

## Materials and Method

We have screened 104 hemodialysis patents at PHMH, middle region of Jordan, for the possible prevalence of hepatitis c virus antibodies between January and October 2010.

The clinical and demographic information about the patients were obtained from records review and patients themselves.

Serum samples were tested for serum creatinine, hematocrit, and blood sugar. Serological tests for the detection of HCV and HBV antibodies were performed using third generation enzyme linked immunoassay (ELISA).

Hemodialysis protocol at PHMH is 3-4 hours twice to thrice weekly, according to residual kidney function and the patients' wellbeing.

Universal precautions and standard infection control measures including the use of gloves, disinfection of surfaces, using disposable kits, needles, and dialyzers were the role. Disinfection of the dialysis machine between hemodialysis session, and at the end of the day was performed with appropriate chemical solution according to manufacturer's recommendation.

According to the number of blood transfusions, we stratified the patients into four groups: - group one: none, group two received less than ten units, group three: ten to twenty units, group four: more than twenty units.

According to duration of hemodialysis, we divided the study population into three groups: group one: less than 12 months, group two: 12 to 36 months, and group three: more than 36 months.

To conduct the study the approval of the ethical committee of Royal Medical Services was given. Analysis of data was done by determining frequencies, and percentages for variables under study. Using the SPSS package, chi square was applied to determine the possible relationship between HCV positivity and risk factor, while t test was performed to assess the impact of HCV infection on age, creatinine level and hematocrit. Finally the results were considered significant when P values were < 0.05.

## Results

In this study we screened 104 patients on regular hemodialysis. There were 57 (54.8%) males and 47(45.2%) females. The mean age of the study population is 50.83 years ranging from 14-95 years. HCV infection was detected in 21(20%) patients, of whom 11 (52.3%) were male and 10 (47.7%) female patients (Table 1 - opposite page).

The means of age of HCV-positive and HCV-negative patients were 47.53 and 55.69 years respectively. (P-value=0,017). (Table 2 - opposite)

The frequency of HCV infection in male patients was 19.2%, while it was 21.2% in females. (P value=0.25)

None of our patients had a history of drug abuse or history of HCV infection before the onset of hemodialysis.

Mean duration of hemodialysis treatment was significantly longer in the anti HCV positive patients (53.3 months, range 11-252 months) than in anti HCV negative patients (19.4 months, range 1-109 months).

The proportion of anti HCV positive patients increases as duration of hemodialysis lengthens e.g. 3 % (1 from 33 patients) in 0-12 months, 21.2 % (7 from 33) in 13-36 months, 34.2% (13 from 38 patients) in more than 36 months; the P value for this correlation was 0.023.

On other hand the data of our study showed that 70 (67.3%) patients has received blood; the remaining 34 (32.6%) patients never had a blood transfusion.

The average number of blood transfusions to anti HCV negative and anti HCV positive was 1.95 units (range 0-14 units) and 10.43 units (range 0-31 units) respectively.

34 patients (32.6%) had never received a blood transfusion; 2.9% of them were HCV positive. 40 patients (38.4%) received up to 10 units, 10% of them were HCV- positive. 20 patients (19.2%) received between 11 and 20 units, 35% of them were found to be HCV- positive. 10 patients (9.6%) received more than 20 units; 90% of them were infected by HCV. The P value for this correlation was (0.001).

Regarding surgical history (including kidney transplantation), we have 57 (54.8%) patients who underwent variable surgeries; of them 16 (28%) were HCV-positive, and 47 (45.2%) patients did not have a surgical history, 5 (10.6%) patients were found to be HCV-positive. In this correlation the P value was (0.02).

The present study shows that 53 patients (50.9%) were diabetic, of whom 11 patients (20.6%) were HCV- positive and 51 patients (49%) were non-diabetic; of whom 9 patients (19.6%) were HCV - positive. The P value was 0.59 (Table 3 - opposite page).

The mean creatinine level in the study population was 8.5mg/dl, and it was higher in HCV positive patients than in HCV negative patients, being 8.55 and 7.54 mg/dl respectively; the P value was (0.03).

On the other hand the mean hematocrit level of study population was 28.03%, and it was lower in HCV- positive than in HCV- negative patients being 27.8% and 28.36% respectively. The P.value was (0.32). (Table 2).

Parameters	Values	SD
Total number of study population (patients)	104	
HCV-positive patients; male/ female	11/10	
HCV- Neg. patients; male/ female	46/37	
Mean age of study population (years)	50.83	17.29
Age range (years)	14-95	
Mean creatinine level (mg/dl)	8.15	2.31
Mean hematocrit (%)	28.03	2.74
HBsAg- positive (patients)	3	
HBV/ HCV co-infection (patients)	1	

Table 1: Demographic and biochemical properties of the patients

Parameter	HCV +ve patients	HCV -ve patients	P value
Mean of age (years)	47.53(sd=17.24)	55.69(sd=16.38)	0.017*
Mean of creatinine (mg/ dl)	8.55(sd=2.31)	7.54(sd=2.20)	0.028*
Hematocrit (%)	27.81(sd=3.07)	28.36(sd=2.14)	0.316

Table 2: Comparison of HCV positive and negative patients with regard to mean age, mean creatinine and hematocrit

Risk factors	HCV + ve patients	P values
Gender	Male (n-57)	19.2%
	Female (n-47)	21.2%
HBsAg	Positive (n-3)	33.3%
	Negative (n-101)	19.8%
Duration on hemodialysis	<12 months (n-33)	3%
	12-36 months ( n-33)	21.2%
	>36 months (n-38)	34.2%
Number of transfused blood units (units)	None (n-34)	2.9%
	<10 (n-40)	10%
	10-20 (n-20)	35%
	> 20 ( n-10)	90%
Surgical history including kidney transplantation	Yes (n-57)	28%
	No (n-47)	10.6%
Diabetes mellitus	Yes (n-53)	20.6%
	No n-51))	19.6%

Table 3: Risk factors and their significance in HD patients

Three patients of our study population were positive for HBsAg, one (33.3%) of them were HCV- positive. The frequency of HCV in HBV positive patients was 33.3% while it was 19.8 % (20 from 101 patients) in HBV negative (p value=0.03). (Table 3).

### Discussion

The prevalence of HCV infection in hemodialysis patients varies geographically, both within and between countries (16-20, 25, 26). This wide difference may reflect the different prevalence rates of HCV infection among the general

population and the hygiene standards followed in HD units and other medical settings in these countries (27,28,29) and despite the considerable decline in prevalence of HCV infection among hemodialysis patients in recent years (30), this infection remains a major health problem among hemodialysis patients.

In Jordan the prevalence of HCV infection in the general population is not known, but it is available for some groups of population such as healthy blood donors (31), multi-transfused patients with hereditary hemolytic anemia (32), and hemodialysis patients (16-20).

The results of the present study indicate that the frequency of HCV infection in our patients is comparable with those reported in some previous studies in Jordanian hemodialysis patients (16-18), but it is still significantly lower than those reported by other studies (19,20). This may be attributed to the difference in the prophylactic and preventive standards followed in HD units, in addition to possible differences in hygiene standards in other medical settings, such as surgical rooms and the blood donation system. On other hand, the comparison of our results with those reported by studies in other countries shows that HCV antibodies in our unit is less prevalent than in some countries such as Egypt and Sudan (26, 33), while it was higher than in other countries like Iran and countries in Western Europe (25,34) .

In concordance with studies held in Jordan and other countries (19, 35) our study shows that the frequency of HCV infection in hemodialysis patient is more than HBV infection. This may be attributed to the use of a dedicated hemodialysis machine for HBV-positive patients as well as the early and effective vaccination against HBV, a treatment which is not yet available for HCV positive patients. The data of the study shows a statistically significant correlation between the frequency of HCV infection and duration of hemodialysis, history of surgery, number of blood transfusions, and HBV infection, suggesting the importance of nosocomial transmission of HCV in HD as well as in surgical and blood donation settings, making the strict adherence to "Universal Infection Control Precautions" as a measure of first priority in order to block the transmission of this infection.

On the other hand, other risk factors like gender and diabetes mellitus did not show any statistically significant correlation with frequency of HCV infection in our hemodialysis population.

The present study shows that mean age in HCV positive patients is significantly lower, while mean creatine is higher than in HCV- negative patients, suggesting the possible role of HCV infection in increasing the burden of renal disease and decreasing the life expectancy in the hemodialysis population. These data are in agreement with the results reported by many studies investigating the impact of HCV infection on renal disease and life expectancy (3, 12, 13, 15).

Although hematocrit level is higher in HCV- negative than HCV- positive patients, both levels are comparable and

difference has never been statistically significant; data which is concordant with some studies held in other countries (36).

The retrospective nature of the study was a limitation as not all patients receive complete examination and some information regarding medical history and history of blood transfusion might be lost. Another limitation lies in not using polymerase chain reaction (PCR); the test which is more sensitive than ELISA in the diagnosis of HCV infection (37). We believe that a better conclusion and management plan will be achieved if PCR and genotyping of HCV has been performed.

## Conclusion

Although the prevalence of HCV infection in our HD unit is low when compared to previous national data, the results of the study strongly suggest the role of nosocomial transmission of infection, making the more strict and continuous adherence to infection control precautions in the HD setting, surgical rooms, and blood donation system, as a first priority, in order to decrease the prevalence of this infection. Further prospective multi-center studies of viral hepatitis using PCR and viral genotyping are needed in the Jordanian hemodialysis population for more accurate results and conclusions.

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# Prevalence of Hypertensive Retinopathy in Prince Zaid bin Al-Hussein Hospital

## ABSTRACT

To find out the prevalence of hypertensive retinopathy among hypertensive patients in Prince Zaid bin Al-Hussein Hospital.

**Methods:** An observational study of 200 patients with hypertension, (mean age =  $60 \pm 17$  range between 40 and 75 years), attending the ophthalmic and medical divisions in Prince Zaid bin Al-Hussein Hospital in South of Jordan. All participants visited the clinics for complete history and an eye examination after dilating the pupil with 1% Mydriacyl. Grading of hypertensive retinopathy at the time of examination was done according to the Keith-Wagener retinal changes classification for hypertension.

**Results:** There were 115 male and 85 female patients. 90 patients had the finding of hypertensive retinopathy; the overall prevalence was 45%. 42 were males and 48 were females. 40 had grade I, 35 had grade II, 10 had grade III, and 5 had grade IV, with male prevalence of 42% and female of 48%. It increases with the hypertension duration, age, and with multiple drug therapy.

**Conclusions:** Prevalence of hypertensive retinopathy is quite high in our region. This results from uncontrolled hypertension, seen in both sexes and almost in all age groups. It increases with duration of the disease, age, and is higher in patients who are taking drug combinations.

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### Introduction

Hypertension is a chronic medical condition in which the blood pressure is elevated. It is also referred to as high blood pressure. The word "hypertension", by itself, normally refers to systemic, arterial hypertension.[1]

Hypertension can be classified as either essential (primary) or secondary. Essential or primary hypertension means that no medical cause can be found to explain the raised blood pressure and represents about 90-95% of hypertension cases.[2][3][4][5] Secondary hypertension indicates that the high blood pressure is a result of (i.e., secondary to) another condition, such as kidney disease or tumors (adrenal adenoma or pheochromocytoma).

Persistent hypertension is one of the risk factors for strokes, heart attacks, heart failure and arterial aneurysm, and is a leading cause of chronic renal failure. [6] Even moderate elevation of arterial blood pressure leads to shortened life expectancy. At severely high pressures, defined as mean arterial pressures 50% or more above average, a person can expect to live no more than a few years unless appropriately treated. [7] Beginning at a systolic pressure (which is peak pressure in the arteries, and which occurs near the end of the cardiac cycle when the ventricles are contracting) of 120 mmHg and diastolic pressure (which is minimum pressure in the arteries, which occurs near the beginning of the cardiac cycle when the ventricles are filled with blood) of 80 mmHg (commonly written as 120/80 mmHg), cardiovascular disease (CVD) risk doubles for each increment of 20/10 mmHg [8]

The neurological effects of long standing hypertension may be divided into retinal and central nervous system changes. Because the retina is the only tissue in which the arteries and the arterioles can be examined directly, repeated ophthalmoscopic examination provides the opportunity to observe the progress of the vascular effects of hypertension[9,10,11].

Perhaps the best known classification of hypertensive retinopathy is the Keith-Wagener classification. It is as follows:

**Grade I** Mild narrowing or sclerosis of retinal arteries.

**Grade II** Moderate to marked narrowing or sclerosis with enhanced light reflex and arteriovenous crossing changes.

**Grade III** In addition, haemorrhages or cotton wool spots.

**Grade IV** In addition, swelling of optic nerve head (papilloedema) or retina[12]

A higher prevalence of retinopathy has been reported among black persons than among whites; a difference that is explained in large part by the higher levels of blood pressure among blacks.(13,14)

A major aim of treatment is to prevent, limit, or reverse such target organ damage by lowering the patient's high blood pressure. The eye is an organ where damage is easily visible at an early stage, so regular eye examinations are important.

## Materials and Method

The study was carried out in the outpatient clinics. Blood pressure was measured with mercury sphygmomanometer at the time of admission or in the outpatient department at the time of visit, after the patient had been comfortably seated.

Investigations were performed in all patients including complete blood count(CBC), erythrocyte sedimentation rate(ESR), complete urine examination, blood glucose, blood urea, serum creatinine, serum cholesterol, electrocardiography (ECG) and chest X-ray.

In this clinical study data related to retinopathy was collected with the help of ophthalmoscope, after dilatation of the pupils with 1% mydriacyl.

Hypertensive retinopathy was graded according to the Keith-Wagener and Baker classifications.

## Results

The study included 115 male and 85 female (hypertensive) patients. 90 patients had the finding of hypertensive retinopathy; the overall prevalence of 45%. 42 were males and 48 were females. Out of these 90 patients, 40 had grade I, 35 had grade II, 10 had grade III, and 5 had grade IV with male

prevalence of 42% and female of 48%. It increases with the hypertension duration, age, and multiple drug therapy (see Table 1 - below).

## Discussion

Hypertension is a risk factor for various forms of cardiovascular disease. Accelerated hypertension leading to hypertensive retinopathy can produce visual disturbance and can lead to loss of vision. So, in hypertensive patients it is important to look carefully at the retina, as the changes will help to decide if treatment is necessary, if it is adequate, or if it is needed urgently. Grading is a useful guide to severity of hypertension and helps in assessing both immediate and longer term changes. It is important to remember that blood pressure high enough to damage renal and cerebral vessels is best organized by looking carefully at the retinal vessels, because there may be no symptoms even in those patients with more severe retinopathy, as the vision in most patients remains normal.

In our study, prevalence of hypertensive retinopathy increases with age and duration of disease. The prevalence was maximum in duration of 10 years or above and age group >50 years. Retinal lesions are relatively frequent in older people without diabetes and significantly related to the pressure and severity of hypertension. We also observed that the patients who were taking their medicine regularly had retinopathy with the prevalence less than who were careless about the control of BP and taking their medicine irregularly.

So we conclude from our study that the prevalence of hypertensive retinopathy increased with the duration of the disease, uncontrolled hypertension, is seen in both sexes, more in elderly patients, and higher in patients who are taking drug combinations.

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Hypertensive Retinopathy Grades	No. of males	No. of females	Total	%
Normal	73	37	110	55%
Hypertensive Retinopathy	42	48	90	45%
Grade I	16	24	40	20%
Grade II	20	15	35	17.5%
Grade III	4	6	10	5%
Grade IV	2	3	5	2.5%

Table 1: The prevalence of hypertensive retinopathy

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# The role of ultrasonography and computed tomography in evaluating patients with blunt abdominal trauma

## ABSTRACT

**Objective:** to evaluate the role of abdominal ultrasonography and computed tomography in patients with blunt abdominal trauma and to compare their results with the operative findings and clinical outcome of patients with blunt abdominal trauma.

**Methods:** a prospective study conducted at the Radiology Department of Prince Rashid hospital in Irbid, Jordan between August 2010 and April 2011. All patients presented to the emergency room complaining of abdominal trauma that necessitates performing ultrasonography with or without computed tomography, were included in the study. Patients with penetrating trauma were excluded from the study. 42 patients were enrolled in this study and were divided into 2 groups; group A which consists of 12 patients are those who underwent ultrasonography alone and the remaining 30 patients (group B) underwent ultrasonography followed by computed tomography. The results of the two groups were analyzed and compared with the operative findings and the clinical follow up of the patients.

**Results:** Computed tomography had 100% sensitivity in all patients with abdominal lesions and also 100% specificity in all types of injuries except for splenic injury in which it had 86%. Ultrasonography showed 100% sensitivity and specificity for haemoperitoneum but it had 0% sensitivity and specificity for bladder and bowel injuries. For other types of injuries it had 50-71% sensitivity and 60-100% specificity.

**Conclusions:** Ultrasonography is inferior to computed tomography in detecting visceral injury and effective as computed tomography in detecting haemoperitoneum. Ultrasonography is effective for initial assessment where the use of computed tomography is limited and in asymptomatic patients with normal clinical examination where ultrasonography scans can be followed up without performing computed tomography scan.

**Keywords:** Blunt abdominal trauma, ultrasonography, computed tomography

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### Introduction

Blunt abdominal trauma is considered one of the common reasons for attendance to the emergency department. It usually results from motor vehicle collisions, assaults, recreational accidents, or falls (1). The most commonly injured organs are the spleen, liver, retroperitoneum, small bowel, kidneys, bladder, colorectum, diaphragm, and pancreas.(2) Men tend to be affected slightly more often than women. Blunt abdominal trauma requires speed and efficiency in diagnosing intra abdominal lesions because missed intra-abdominal injuries and concealed hemorrhage are frequent causes of increased morbidity and mortality. Unfortunately, patient history and physical examination are usually unable to diagnose acute traumatic pathology accurately. (3) Peritoneal lavage was historically used to determine which patients needed exploratory laparotomy, but it is difficult to perform in pregnant patients; it cannot be used for serial assessment, and it leads to a high negative laparotomy rate.(4) Abdominal computed tomography (CT) is thought to have better specificity than peritoneal lavage for intra-abdominal injury and it is extensively used in North American centers as the initial modality of diagnosis.(5) but it is difficult to be performed in hemodynamically unstable and pregnant patients.(6)Ultrasonography (ULS) is safe, inexpensive, repeatable, accessible at the bedside, and requires little patient preparation, although it has become a controversial issue in Canada,(7) but it is still preferred as an initial modality in continental Europe and Japan.(8) Nevertheless, ULS has important limitations in the evaluation of the abdomen in injured children. Firstly, it does not provide any diagnostic information regarding injury to the pelvis or lumbar spine and it cannot be used in the diagnosis of hollow viscus injury.(9)

The aim of this paper is to evaluate the role of abdominal ultrasonography and CT in patients with blunt abdominal trauma and to compare their results with the operative findings and clinical outcome of patients with blunt abdominal trauma.

Positive Finding	No. of patients	ULS		CT	
		sensitivity	specificity	sensitivity	specificity
Haemoperitoneum	22	100%	100%	100%	100%
Splenic injury	7	71%	80%	86%	100%
Liver injury	7	71%	60%	100%	100%
Renal injuries	2	50%	100%	100%	100%
Bladder injuries	1	0%	0%	100%	100%
Bowel injury	1	0%	0%	100%	100%

Table 1: Sensitivity and Specificity of ULS and CT in patients with blunt abdominal trauma

This is a prospective study conducted at the Radiology Department of Prince Rashid hospital in Irbid, Jordan between August 2010 and April 2011. All patients presented to the emergency room complaining of abdominal trauma that necessitated performing ULS with or without CT, were included in the study. Patients with penetrating trauma were excluded from the study. 42 patients were enrolled in this study and were divided into 2 groups; group A which consisted of 12 patients are those who underwent ULS alone, and the remaining 30 patients (group B) underwent ULS followed by CT. The results of the two groups were analyzed and compared with the operative findings and the clinical follow up of the patients.

## Results

42 patients aged between 8 and 47 years (mean age 33.4 years) were enrolled in this study; 32 (76.2%) of them were males. 10 (23.8%) of them belonged to the pediatric age group. In regard to the mechanism of injury motor vehicle collisions, either occupants or pedestrians, were responsible for 28(66.7%) of patients, while 10 (23.8%) patients were due to falling down and the remaining 4 patients were due to assaults.

In group A, ULS was able to detect lesions in 7 patients; haemoperitoneum was the most common finding. It was found in 5 patients and 3 patients had splenic injury and one showed liver injury. One patient with normal ultrasound underwent laparotomy and was found to have bowel injury.

In group B patients, CT was performed within 6 hours of doing the ULS. Table 1 demonstrates the sensitivity and specificity of ULS and CT for detecting abdominal injuries.

In group B, patients 22 patients were found to have haemoperitoneum; 14 of them haemoperitoneum was associated with visceral injury; 15 patients were found to have visceral injury and 3 of them had more than one organ affected. No pancreatic or biliary tract injuries were detected.

CT had 100% sensitivity in all patients with abdominal lesions and also 100% specificity in all types of injuries except for splenic injury in which it had 86%. Although ULS showed 100% sensitivity and specificity for haemoperitoneum, it had 0% sensitivity and specificity for bladder and bowel injuries. For other types of injuries it had

50-71% sensitivity and 60-100% specificity. Figure 1 and 2 summarize the sensitivity and specificity respectively, of ULS and CT for detecting different types of abdominal injuries.

## Discussion

Trauma is a leading cause of morbidity and mortality resulting in more than 1.5 million injuries, 500,000 hospital admissions, and 20,000 deaths per year and the abdomen is the second most common site of injury.(10) In this study the mean age of patients was 33.4 years and male to female ratio was 3:1. This is probably due to more outdoor nature of work and more travel for males and so they will be exposed more to road traffic accidents which were the commonest mode of injury (66.7%). Similar results were obtained by other studies, for example K. Mallik et al found that the mean age of patients with abdominal injuries was 21.9 years with male to female ratio of 3:1. (11) 10 (23.8%) patients enrolled in this study belonged to the pediatric age group. This means that children are commonly exposed to abdominal trauma, but it should be mentioned that only one patient required laparotomy. The explanation for this observation is that children have smaller blood vessels with enhanced vasoconstrictive response so that bleeding associated with solid viscus injury usually stops. As a result, most solid viscus injury in children can be successfully managed non-operatively. In a study of 316 children with isolated grade I-IV hepatic or splenic injury, only 1% required laparotomy. (12) Similar to most of the studies,(13) road traffic accidents were responsible for most of the cases (66.7% of patients).

Accurate diagnosis of abdominal trauma is not only important for early intervention of serious injuries, but also it helps to avoid unnecessary operative intervention in cases that can be managed conservatively. The challenge in the imaging of abdominal trauma is to have imaging technique with high sensitivity and specificity.

In the first group of patients in which ULS was performed alone due to instability of patients, ULS was able to detect haemoperitoneum but unable to detect bowel injury. In group B, ULS also showed similar results. If we compare the results of ULS with CT, ULS had the same sensitivity and specificity as CT. This shows that ULS is a very effective imaging technique in detecting haemoperitoneum especially in cases where conducting CT is limited, but it should be emphasized

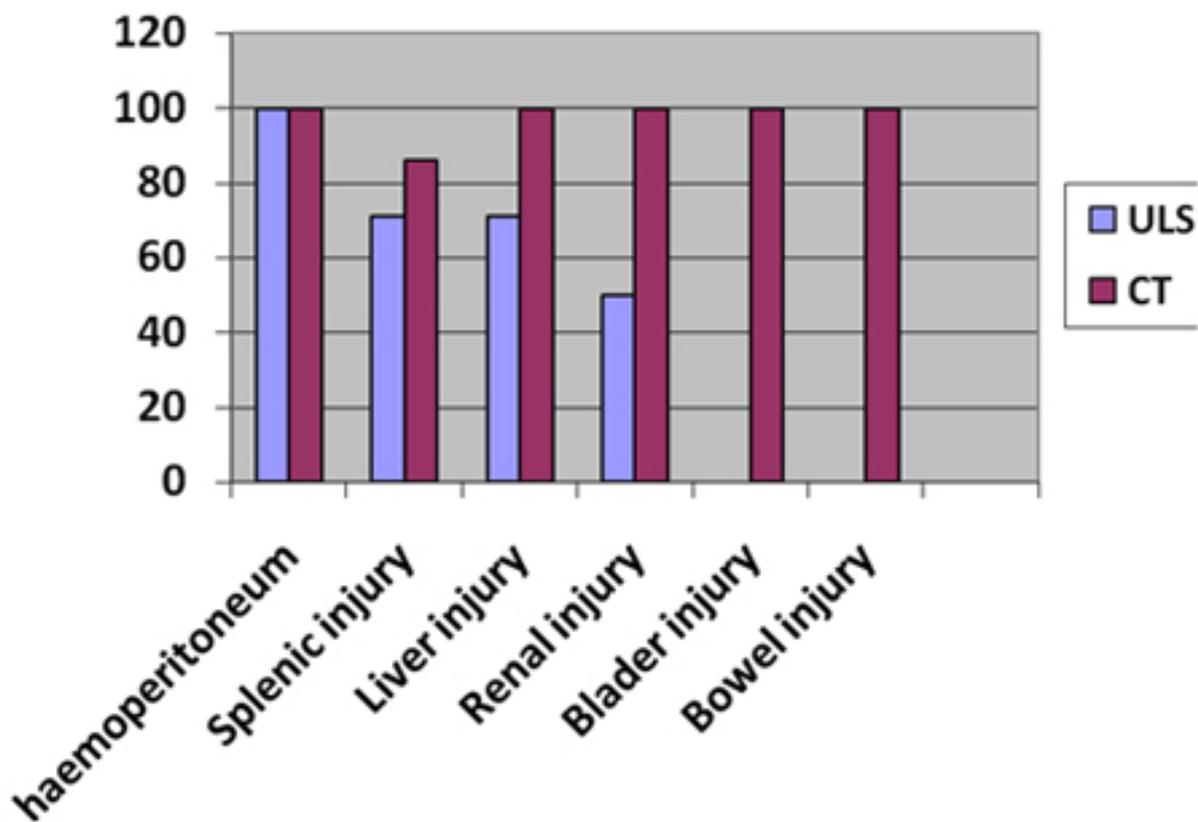


Figure 1: Sensitivity of ULS compared with CT in patients with blunt abdominal trauma

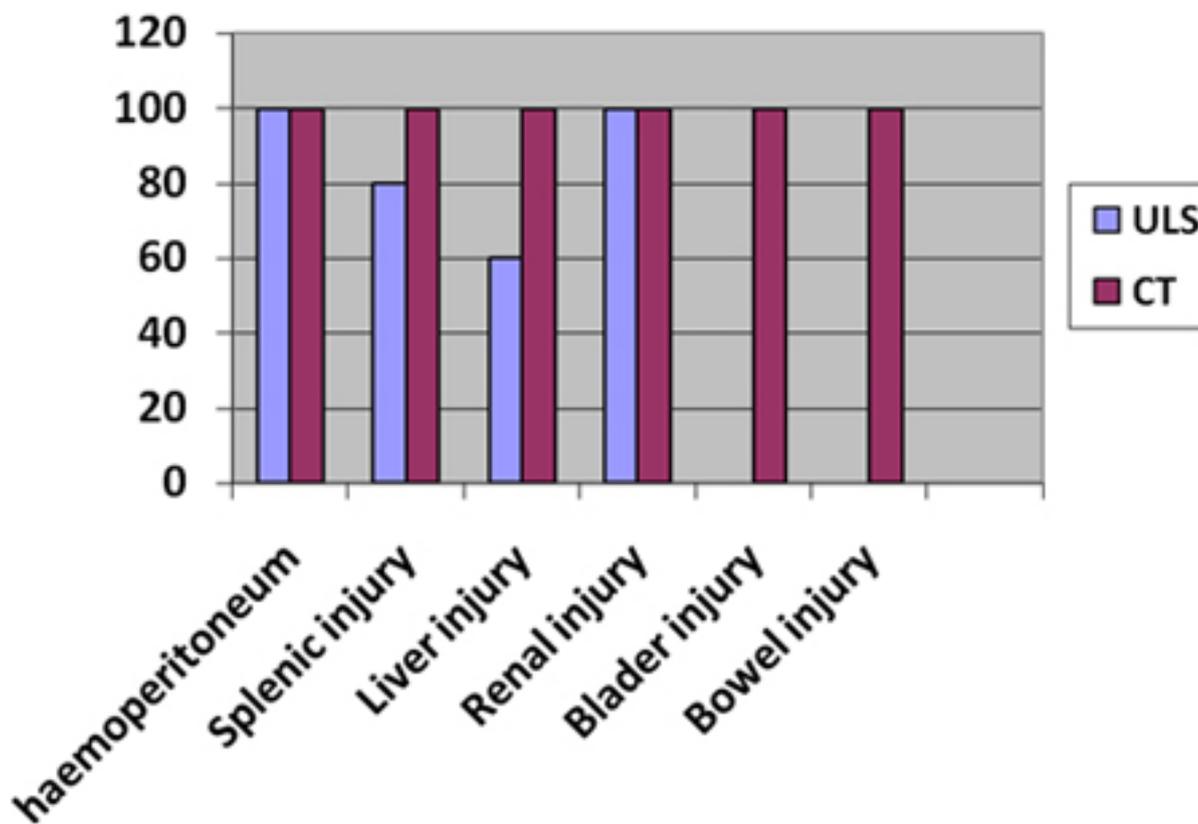


Figure 2: Specificity of ULS compared with CT in patients with blunt abdominal trauma

that haemoperitoneum is usually associated with visceral injury. In our study 64% of patients with haemoperitoneum showed associated visceral injury. Other studies also revealed similar results.(13) K. Mallik et al found in their study that CT was better, even for detection of haemoperitoneum.(11) In visceral injury CT showed more sensitivity and specificity than ULS, and in cases of bladder and bowel injuries ULS failed to detect them. This proves that CT is superior to ULS in detecting visceral injury. It was noticed that in group B patients, CT imaging was normal in all asymptomatic patients with normal ULS, so it appears that asymptomatic patients with normal clinical examination and ULS scans can be followed up without performing CT scan. This is very important in Jordan because not all hospitals in Jordan have CT facility and the patient has to be referred to another hospital to perform CT. In this ULS plays a role in affecting the decision to admit, intervene or refer the patient.

Although the sample of our study was small it clearly showed that ULS is a very effective imaging technique in detecting haemoperitoneum. It has the same sensitivity and specificity as that of CT. CT is superior to ULS in detecting visceral injury.

### Conclusion

In cases of abdominal trauma, ULS is inferior to CT in detecting visceral injury and effective as CT in detecting haemoperitoneum. However ULS is effective for initial assessment where the use of CT is limited due to CT unavailability or patient instability. Asymptomatic patients with normal clinical examination and ULS scans can be followed up without performing CT scan.

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