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## From the Editor



**A. Abyad**

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This month we have a paper from Jordan which investigated the etiological relationship between body weight and incidence of uterine leiomyoma among Jordanian women.

The case control study finds the etiology of myomas is not precisely established but genetic determinants contribute to their development. A variety of other factors, the most apparent of which being (hormonal) estrogen, may play a synergistic or facilitative role in growth. Thus obesity might be a strong factor in the formation of uterine fibroid. A case report from the US highlights a case of non-aneurysmal infectious aortitis.

There are very few documented cases of aortitis in the setting of a normal caliber aorta. This case has the paucity and fascination of having Group B streptococci as the causative agent. Only five cases of Group B aortitis have been reported in English medical literature.

Another paper from Jordan evaluated the consultations referred to pediatric cardiology, in order to improve the quality of cardiac care in children. A wide spectrum of clinical problems which needed a cardiology opinion were addressed. There were certain clinical conditions encountered more frequently and which should be given emphasis in curricula developed for pediatric residency training programs, especially how to elicit cardiac findings accurately.

ST segment elevation in lead aVR in the patient with typical chest pain with suspected acute coronary syndrome is very important in prediction of left main coronary artery disease. A paper from Yemen, on ST segment elevation in lead aVR in the patient with typical chest pain with suspected acute describes rare electrocardiographic findings that suggest left main coronary artery disease.

A paper from Pakistan describes the development of discharge instruction material in Urdu language for hospitalized patients at Aga Khan University Hospital (AKUH) Karachi, Pakistan. Discharge instruction materials were frequently shared with friends and family members. Readability of material was excellent and easy and in laypersons' language.

The authors concluded that discharge instruction as written educational material helped the patient to understand the process and health management when they reached home, with the aim to impart better knowledge and attitudes to improve health.

A further paper from Jordan investigates The Prevalence of Anemia Among People of Gaza attending the Royal Jordanian Field hospitals. Most of the data on prevalence of anemia in Gaza Governorate was obtained from school and preschool children and pregnant women. The prevalence of anemia was found to be high among children and women because of poor nutrition and multiple and close pregnancies among the females. The prevalence of anemia also increased with increasing number of deliveries, and with the increase of mother's age, in this area of the world where there is the highest rates of childbirth, 5.9 pregnancies / woman.

Finally a paper from Kuwait compared Imaging studies used for the Diagnosis and Follow up of Urinary Tract Infection in Children of Al -Jahra Area. The authors found that Renal USG as a sole imaging modality for the evaluation of children with UTI is of limited value. Renal USG, MCUG and DMSA should be the minimum imaging studies for such evaluation.

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# The Prevalence of Anemia Among People of Gaza Attending the Royal Jordanian Field Hospitals (Gaza-I, Gaza-II, Gaza-III, Gaza-IV and Gaza-V)

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and low productivity at work, and ... impairment of reproductive functions" (WHO 1991). Factors that lead to iron deficiency anemia include inadequate bio-available iron in the diet and poor absorption of iron due to the presence of inhibitors of iron absorption such as tannin in tea and phytates from plants (Scrimshaw 1991).

Most of the data on prevalence of anemia in Gaza Governorate has been obtained from school and preschool children and pregnant women; the low standard of living in Gaza, the poverty, malnutrition, and mainly in childbearing women with close pregnancies and large families are the main causes and factors of anemia in this area which is under "siege", in addition to the other causes of anemia like thalassemia as it is well known it is common in the Mediterranean area.

## Materials and Population

Study area and population: As shown in Figure 1 Gaza Governorate is an area in the Mediterranean region on the south-eastern coast of the Mediterranean Sea. It is a small

## Abstract

From the 28th January 2009 to 13th December 2009, a total of 5,856 patients were screened for anemia in Gaza Governorate in the Royal Jordanian Field Hospital. Hematocrit level was measured for these patients and revealed an overall prevalence of 48.33 % (2830 / 5856), and it also revealed overall prevalence of severe anemia of 42.12% (1192 /2830). The high prevalence was noted as expected among adult females and the low prevalence was among the adult males.

The aim of the study is

1. To estimate the prevalence of anemia among the people of Gaza Governorate, according to age group and gender.
2. To estimate the prevalence of severe anemia in the same study sample and
3. To compare these results with similar studies in Gaza people.

## Introduction

Anemia is estimated to affect 2.2 billion individuals worldwide, half of whom are estimated to have iron deficiency (WHO 1991). In most areas of the world, iron deficiency affects primarily infants and young children because of a higher iron requirement related to growth, and women of childbearing age as a result of menstrual loss and pregnancy. The effects of anemia include "retardation of physical and mental development, fatigue

## Diagnostic Criteria

The diagnostic criteria that we considered in our study were the WHO's hemoglobin Thresholds used to define Anemia which is shown in Table 1.

Age or Gender group	Hemoglobin g/dl	Hematocrit (%)
Children (0.5 - 4)	< 11.0	< 33
Children (5 -12)	< 11.5	< 35
Children (12-15)	< 12	< 36
Adult Men	< 13	< 39
Non-pregnant women	< 12	< 36
Pregnant women	< 11	< 33

Table 1: The WHO's Hemoglobin Thresholds used to define Anemia.



Figure 1

Age + gender	Total number of patients	Number of patients with anemia	Prevalence of anemia	The overall prevalence	Prevalence of severe anemia
Children (M+F)	2421	1259	52%	21.5%	46.39%
Adult Male > 15 years	918	369	40.19%	6.3%	60.16%
Adult Female > 15years	2517	1202	47.57 %	20.52 %	32.27%
<b>Total</b>	<b>5856</b>	<b>1202</b>		<b>48.33 %</b>	<b>42.12%</b>

Table 2 : The prevalence according to age and gender

piece of land and its surface area is about 365 square Km, with an estimated population of about 1.5 million. More than 70% of Gaza Governorate population is refugee and 44.5 % of the refugee population resides in eight densely crowded camps.

## Results

In this screening study we surveyed a total number of 5,856 patients who attended the Royal Jordanian Field Hospitals in the period between 28th of January 2009 till the 13th of December 2009, with acknowledgment that the total

number of the patients who attended the hospital in general was 155,659 patients. We found the following results:

1. The total number of children (male and female) in our sample was : 2421 children, and the total number of children who have anemia was : 1,259 children.

The prevalence of anemia among children:  $1259/2421 = 52\%$ .  
The overall prevalence of anemia among children:  $1259/5856 = 21.5\%$

2. The total number of adult males aged >15 years, was : 918  
The total number of male patients with anemia was: 369  
The prevalence of anemia among adults:  $369/918 = 40.19\%$ . The overall prevalence of anemia among male patients:  $369 / 5856 = 6.3\%$ .

3. The total number of females patients aged > 15 years pregnant and non-pregnant, was 2517, The total number of female patients with anemia: 1202, the prevalence of anemia among females:  $1202 / 2517 = 47.57 \%$ , and the overall prevalence  $1202 / 5856 = 20.52 \%$ .



4. The total number of patients with anemia (males, females and children): 2830, the overall prevalence of anemia among people of Gaza:  $2830 / 5856 = 48.33\%$ .

5. Total number of patients with severe anemia 1192; the overall prevalence of severe anemia was  $1192 / 2830 = 42.12\%$

## Discussion

The prevalence of anemia in children was 52%, but the overall prevalence of anemia in children was 21.5%. Analysis of these results showed that the high prevalence of anemia in children of Gaza Governorate, suggests that much of the anemia was due to iron deficiency; it is likely that most of the non-anemic children were also affected to some extent by iron deficiency. Although there are many nutritional and non-nutritional causes of anemia worldwide, iron deficiency is usually the only nutritional disorder that can produce such a high prevalence of anemia. In certain parts of Africa, malaria is a major cause of anemia; however, the area in which the present survey was performed has been malaria free for decades. Additional information collected during the survey showed moderate prevalence of anemia among women and low prevalence of anemia among men. The prevalence of anemia in females, pregnant and non-pregnant women, was 47.57% (Hb < 12 g/dl hematocrit level < 36%), but the overall prevalence

in women was 20.52% and the prevalence of severe anemia in the same group was 32.27%. Among men, the prevalence of anemia was 40.19% (Hb < 13g/dl hematocrit level < 39%), but the overall prevalence in men was 6.30%, and the prevalence of severe anemia was 60.16%. Only iron deficiency due to poor iron intake is known to result in a differential pattern of anemia among children, women and men (Yip 1994). Other major causes of anemia, including anemia due to increased blood loss or hookworm infection, affect both men and women. Two possible ways to determine more definitively if iron deficiency was a major contributor to the overall prevalence of anemia would be through additional biochemical tests or by hemoglobin response to oral iron treatment (Dallman et al. 1981).

A study by Birzeit and Case Western university researchers that was reported in 2005 showed anemia (less than 11 g/dl) rates in 41.6% in Gaza children.

Another study was conducted by Haifa Husni, MD MPH, Health Department /Family Health, UNRWA Headquarter, Amman. This study was conducted to estimate the prevalence of anemia among pregnant Palestinian Refugee women residing in Gaza and other Arab Countries and who attended the prenatal clinics during the period 15-31 May 1999 (n=11,582). This study

showed that the overall prevalence of anemia was 44.75 in Gaza pregnant women.

As we can see that all previous studies showed high prevalence of anemia among children and women, mainly pregnant women, and all the studies available in the text were done on children and pregnant women in Gaza, but our study was conducted in the Royal Jordanian Field Hospital from 28th January to 13th December and it involved all children, women (pregnant and non-pregnant) and men, of all age groups.

## Conclusions

The prevalence of anemia was high among children and women because of poor nutrition and multiple and close pregnancies among the females. The prevalence of anemia also increased with increasing number of deliveries, and with the increase of mother's age, in this area of the world where there is the highest rates of childbirth, 5.9 pregnancies / woman.

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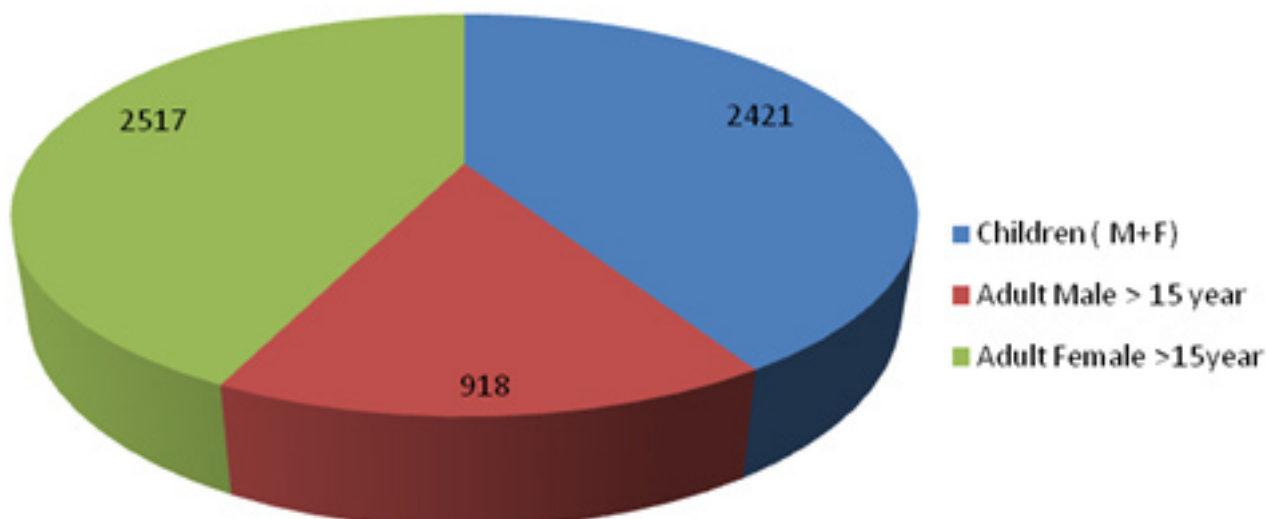


Figure 2 (Figure 3 next page)

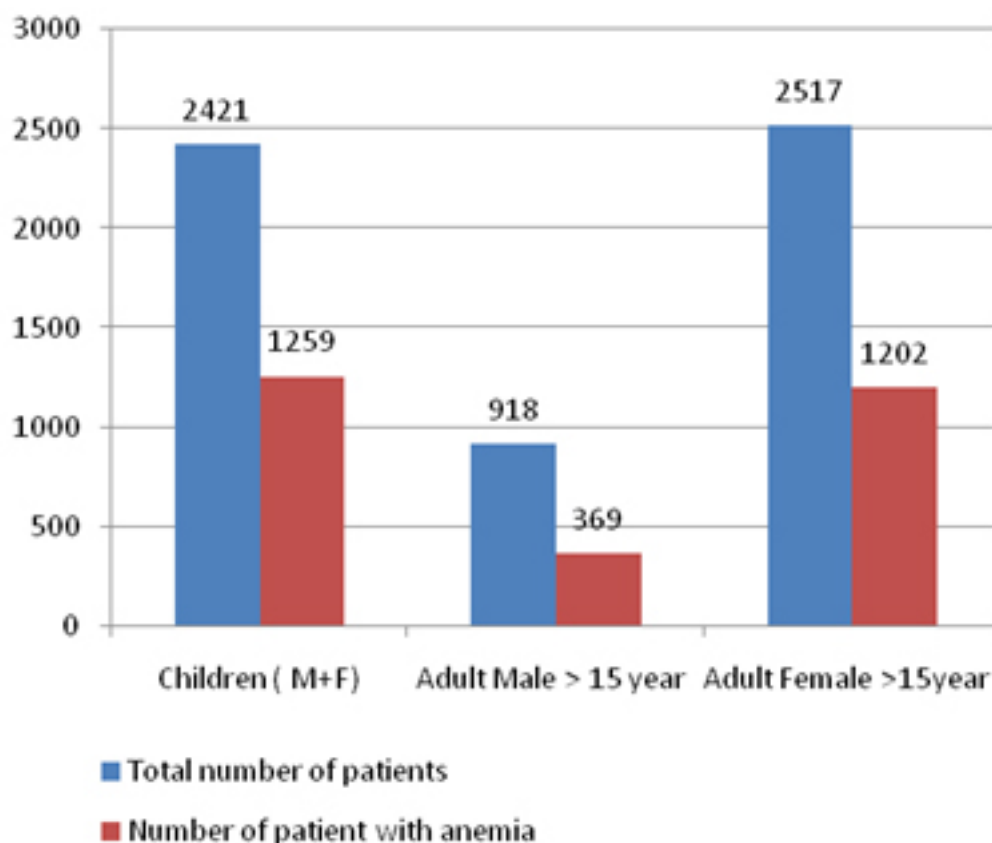


Figure 3

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# Relationship between Fibroid Uterus and Obesity

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## Introduction

Myoma is the most common benign tumor of the uterus which involves the smooth muscles and it is hormonally (estrogen) dependant as well as there is genetic predisposing factors.

Weight is strongly related to the risk of developing uterine fibroid. Women weighing 70 Kg or more have an almost three fold risk of developing fibroids compared with women weighing less than 50 kg (1-4). Obesity increases the risk of fibroid development by 21% with each 10 kg weight gain (Ross et al 1986). Shikora et al (1991) reported that 50% of women presenting with symptomatic uterine fibroid were obese and 16% were very obese.

There may be explanations for the weight related risk of uterine fibroid. The first is the increased peripheral conversion by fat aromatase of circulating androgens to estrogens in obese women. The second reason is the decrease in the hepatic production of sex hormone binding globulin (SHBG). This lowered concentration of SHBG may result in higher levels of free, physiologically active estrogen (Shikora et al 1991).

Therefore, obesity confers a relative hyper estrogenic state, which may predispose to uterine fibroid growth.

This study was undertaken to assess obesity as a risk factor for uterine fibroid. This important relation might have significance in the community as a whole as it adds to other risks of obesity in women, which will encourage obese women to lose weight.

## Methods

This was a case-controlled study involving 206 patients, conducted between March 2008 and March 2010 in Prince Rashid Hospital in Irbid north of Jordan . 206 patients were enrolled in the study. The study population comprised 206 patients with uterine fibroid whose BMI+SD were compared with those of age matched controls.

## Abstract

**Objectives:** To investigate the etiological relationship between body weight and incidence of uterine leiomyoma among Jordanian women.

**Methods:** This was a case-control study done between March 2008 and March 2010 in Prince Rashid Hospital in Irbid, North of Jordan. The study population comprised 206 patients with uterine fibroid whose BMI+SD were compared with those of age matched controls.

For comparative purposes, obstetric and medical history was taken, then bimanual pelvic examination and pelvic ultrasound assessment were carried out on all the patients. Women with medical disease and pregnant women were excluded from this study.

All patients were weighed and their height measured. From these values, the BMIs and SD were calculated.

**Results:** Table 1 shows the age distribution of patients with uterine fibroid. Table 2 shows the age distribution for those control groups. The highest incidence for uterine fibroid was recorded for age group 26-30 years (35.9%)

and the lowest incidence of 15.5% among women aged 21-25 years as shown in Table 1.

(Tables 1 and 2 can be found on page 8)

**Conclusion:** An etiology of myomas is not precisely established but genetic determinants contributed to their development. A variety of other factors, the most apparent of which being (hormonal) estrogen, may play a synergistic or facilitative role in growth. Thus obesity might be a strong factor in the formation of uterine fibroid.

**Key words:** fibroid uterus, obesity

Age (year)	Number of patients	Percentage
21-25	32	15.5%
26-30	74	35.9%
31-35	56	27.2%
36-40	44	21.3%

(Total No. = 206)

**Table 1: Age distribution of patients with uterine fibroid**

Age (year)	Number of patients	Percentage	Mean BMI+SD
21-25	32	15.5%	20.88+3.70
26-30	74	35.9%	21.13+6.54
31-35	56	27.2%	21.95+3.74
36-40	44	21.3%	22.63+4.76

(Total No. = 206)

**Table 2: Age distribution of control patients and their BMI+SD**

For comparative purposes, obstetric and medical history was taken, then bimanual pelvic examination and pelvic ultrasound assessment were carried out on all the patients. Women with medical disease and pregnant women were excluded from this study.

All patients were weighed and their height measured. From these values, the BMIs and SD were calculated.

## Results

For comparative purposes, obstetric and medical history was taken, then bimanual pelvic examination and pelvic ultrasound assessment were carried out on all the patients. Women with medical disease and pregnant women were excluded from this study.

All patients were weighed and their height measured. From these values, the BMIs and SD were calculated.

Table 1 shows the age distribution of patients with uterine fibroid; Table 2 shows the age distribution for the control group.

The highest incidence for uterine fibroid was recorded for age group 26-30 years (35.9%) and the lowest incidence of 15.5% was among women aged 21-25 years as shown in Table 1.

Secondly, incidence of uterine fibroid was found to be related to body weight of women age 26-40 years. In this age group the mean BMI+SD was found to be significantly higher than that of controls; 25.55+4.96 vs 21.13+6.54 for women aged 26-30 years, 24.12+4.21 vs 21.95+3.74 for women aged 31-35 years, 25.15+4.72 vs 22.63+4.76 for women aged 36-40 years.

However there was no significant difference between BMI+SD of patients aged 21-25; their age - matched controls (19.85+2.40 vs 20.88+3.70) with p value less than 0.05.

## Discussion

Obese women tend to produce relatively more estrogen than thin subjects and this is reflected in the positive correlation which can be for comparative purposes. Obstetric and medical history were taken when bimanual pelvic examination and pelvic ultrasound assessments were carried out on all patients.

All the patients were weighed and their heights measured and from these values the BMIs +SD was calculated.

The fat distribution in overweight patients with a BMI over 24.0% presented with prominent abdominal

fat distribution (49%) while 18.5% had prominent gluteal fat distribution and 9.4% had both 0.50 occult obesity and upper body fat distribution which may lead to development of uterine leiomyoma.

From the result of our study it is evident that the incidence of uterine leiomyoma is highest among age group 26-30 years and it is related to body weight with higher incidence in overweight patients (BMI-24.0) Since the fibroids are known to be estrogen dependent for their growth, the excess body fat contributes to increased estrogen production by the mechanism of peripheral conversion aromatization of androgen to estrogen in fat tissue. Relatively few studies have attempted to identify risk factors for uterine leiomyomata; the major findings from published epidemiologic studies which to date have focused primarily on menstrual and child bearing history exogenous hormone use, obesity, cigarette smoking and other life styles that may in part reflect aspects of women's hormonal milieu(5-13) .

## Conclusion

Overweight might be associated with an increased risk of uterine fibroid formation. This adds to the other health hazards of obesity.



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# Comparison of Imaging studies used for the Diagnosis and Follow up of Urinary Tract Infection in Children of Al -Jahra Area, Kuwait

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## Abstract

**Objective:** To compare and correlate the different imaging modalities used to investigate children with urinary tract infection (UTI) in Al-Jahra area, Kuwait.

**Patients and Methods:** One hundred children with proven urinary tract infection were included in this study. They were investigated using renal ultrasonogram (USG), 99m TcDimercaptosuccinic acid (DMSA) scintigraphy and micturating cystourethrogram (MCUG). The DMSA scanning was performed during the acute stage of infection for the localization of UTI in some patients and after six months of treatment in all patients.

**Results:** Of all the children analysed, renal USG was abnormal in 13 (13%) children. DMSA scan was found to be abnormal in 34 (34%) children and MCUG in 27 (36.4%) children. 7 (9.4%) children had abnormal findings in all 3 modalities. 13 (38.2%) patients with abnormal DMSA scans had abnormal MCUG. 13 (31.7%) patients with negative DMSA scans had abnormal MCUG findings. 13 (48.1%) patients with abnormal MCUG had normal DMSA scans.

**Conclusion:** Renal USG as a sole imaging modality for the evaluation of children with UTI is of limited value. Renal USG, MCUG and DMSA should be the minimum imaging studies for the evaluation of children with UTI.

**Key Words:** Urinary tract infection (UTI), Dimercaptosuccinic acid scan (DMSA), Renal ultrasonogram (USG), Micturating cystourethrogram (MCUG), Vesicoureteric reflux (VUR)

## Introduction

Urinary tract infection is a common cause of morbidity throughout the world. 7% of girls and 2% of boys will have a symptomatic culture confirmed UTI by 6 years of age [1]. The incidence of UTI is greater among younger children. Boys are more susceptible to UTI before the age of 6 months. Thereafter, the incidence is substantially higher among girls than boys. Studies in Al-Jahra area, Kuwait, have revealed an overall incidence of UTI to be 5.5% among children up till 13 years of age. Of these, 5.4% of the patients were males, with a mean age of 2.5 years and 94.6% of the patients were females with a mean age of 6 years [2].

Risk factors for UTI include anatomic anomalies of the urinary tract causing either obstruction to the flow of urine with proximal dilatation or reflux of urine from the bladder. Other risk factors include bladder instability, infrequent voiding, constipation and encopresis.

Identification and management of these risk factors is important because recurrent UTI, especially pyelonephritis, has been associated with reduced renal function, hypertension and chronic renal failure [3].

Hence all children with UTI will need renal imaging and the intensity of investigation and follow up will depend upon the degree of risk estimation.

The aim of imaging in UTI is threefold; firstly, to identify any anatomic anomalies that predispose to pyelonephritis; secondly, to accurately identify pyelonephritis in the acute stage in

atypical cases when the diagnosis is not clear or the response to treatment is suboptimal, so that the appropriate treatment can be instituted promptly. Thirdly, it is to detect evidence of renal damage in the form of renal scars.

The modalities that are used in renal imaging are renal USG, DMSA scintigraphy, MCUG and Radionucleotide cystourethrogram. Different guidelines are available and are used in different parts of the world [4,5]. The NICE guideline categorizes children into three different age groups with different recommendations for each age group. This is keeping in mind that younger children have higher incidence of congenital anomalies including vesicoureteric reflux [4]. The AAP gives clear guidelines for children 2 month to 2 years of age [5].

USG is the most commonly used modality. It is non-invasive and can identify gross anatomic abnormalities. It can also identify acute pyelonephritic lesions and renal scars, but only in a small percentage of patients [6,7].

DMSA scintigraphy is used in the acute phase to identify pyelonephritis [6,7,8]. DMSA scan is done after six months of treatment or in cases of recurrent UTI to assess the kidneys for renal damage [7,9].

MCUG is done to look for anatomical lesions such as VUR, posterior urethral valves, ureterocele, etc. It can also grade the degree of reflux and can also detect any urethral or bladder anomalies [7,10,11].

As the risk of renal damage increases with recurrence in UTI, it is imperative to identify early the high risk factors and manage them appropriately. The aim of this study was to compare the different imaging modalities used in the diagnosis and follow up of UTI in children in Al-Jahra area of Kuwait.

## Results

A total of one hundred patients with symptomatic urinary tract infection who were admitted to the Pediatric Ward of Al -Jahra Hospital from January 2009 onwards were included in this study. They included patients with either the first episode of UTI or recurrent UTI.

The mean age of the children was 5 years and 7 months (Age range 10 days to 12 years). 14% of the patients were boys and 86% were girls. The mean age of both the boys (age range 2 month - 12 years) and girls (age range 10 days - 12 years) was 5 years and 7 months.

Renal USG was done in all the 100 patients. Only 13 (13%) patients had abnormal findings on renal USG. DMSA was done in 99 of the 100 patients. Abnormal DMSA scans were found in 34 patients (34.3%). Of the 34 children with abnormal DMSA, renal USG findings were found in only 11(32.3%)

MCUG was done in 75 patients. It was not done in 25 patients as either it was not indicated as per the UTI protocol being followed at our hospital or it was refused by the parents. Abnormal MCUG was found in 27 (36.4 %) patients in whom it was done. Of these, USG findings were found in 10 (37%) patients.

There were 7 (9.4 %) patients in whom all the three modalities, USG, DMSA and MCUG were abnormal. All the children with abnormal DMSA scans had MCUG done except one. Of the 34 patients with abnormal DMSA scans, MCUG was abnormal in 13 (38.2%) and normal in 20 (58.8%) patients.

There were 65 (65%) patients with normal DMSA scans. MCUG was not done in 24 patients. Among the patients with normal DMSA scans in whom MCUG was done, MCUG was abnormal in 13 (31.7%). There were a total of 75 patients in whom MCUG was done. Abnormal MCUG was seen in 27 (36.4%). Of these 27 patients with abnormal MCUG, 13 (48.1%) had normal DMSA scans and 13 (48.1%) had abnormal DMSA

scans. One patient with abnormal MCUG did not have DMSA scan. There were 28 (37.8 %) patients who had normal renal USG, DMSA and MCUG.

## Discussion

UTI in children is a common cause of morbidity. There are various risk factors for the development of UTI including anatomical abnormalities of the urinary tract. Identification of these risk factors is of paramount importance as recurrent episodes of pyelonephritis have been associated with renal scarring and progressive reduction in renal function, hypertension and chronic renal failure [3]. VUR is the most common anatomical abnormality that has been identified in children with symptomatic UTI. The prevalence of VUR in children with UTI varies between 7-85 % according to the review carried out by the AAP [3]. The modalities used to identify these high risk factors include renal USG, DMSA scintigraphy and MCUG. Renal USG is useful in identifying gross anatomical abnormalities. However, it is of limited value in identifying acute pyelonephritis. Studies have shown that even in cases of confirmed pyelonephritis by DMSA, the percentage of cases identified by renal USG is low [6,7,8].

Renal scars can also be identified by renal USG. However, it is again less sensitive than other imaging modalities [7,12]. Renal scintigraphy can detect renal cortical abnormalities. DMSA in the acute phase of UTI can be considered the gold standard investigation for documenting acute pyelonephritis [8,13,14]. These defects are seen as hypoactive cortical areas on the DMSA scan without loss of renal contour. In the later phase (six months after an infection), it is used for detecting renal cortical scarring, which appears as hypoactive cortical areas with deformed renal contour. It is considered the investigation of choice for the detection of renal scars [15].

The frequency of late sequelae following acute pyelonephritis vary from author to author depending on



the type of patients included in the study, retrospective or prospective character of the patient inclusion, and the time delay between the acute infection and the DMSA scan.

Recent prospective work has shown that no more than 10-12% of patients with clinical acute pyelonephritis will remain with sequelae on the six month DMSA scan [16]. The frequency of renal sequelae on DMSA is higher when acute pyelonephritis is associated with dilated reflux [13,17], but the degree of renal damage is not always proportional to the severity of vesicoureteric reflux [8].

If an acute DMSA scan is normal, then it is generally accepted that in the absence of relapse of infection, the six month DMSA scan is normal [18]. Many of the acute lesions are transitory and will disappear on a later scan [19]. On the contrary, patients with a full clinical picture of complicated UTI may or may not present with abnormalities on the DMSA scan [19].

It is accepted that children with normal anatomy may present with urinary infection and renal damage as a result of abnormal voiding habits.

MCUG has been used to identify bladder abnormalities and VUR. MCUG is the investigation of choice for the detection and grading of VUR [20]. The rate of VUR among children younger than 1 year with pyelonephritis exceeds 50%. The grading of VUR is important because the course and prognosis varies according to the grade of reflux. Higher grades of reflux are likely to present at an earlier age than lower grades which may manifest for the first time at a later age. Patients with higher grade VUR are 4-6 times more likely to have scarring than those with low grade VUR, and 8-10 times more likely than those without VUR [3,21].

A substantial number of defects on the DMSA scan occur in the absence of any structural abnormalities [3,22]. In these cases, the scars are caused due to the infection itself [22,23].

The general belief is that the risk of sequelae after pyelonephritis is highest in infants and older children are at lower risk. This assumption has led to the difference in the treatment recommendations based on age [4,5]. However some studies do not confirm this conventional view [24]. They believe that all children, irrespective of the age will benefit from any measure that prevents the development of renal sequelae. Alternatively, radionuclear cystourethrogram can be used to detect VUR. However, it is less effective in grading VUR and also does not pick up bladder and urethral abnormalities.

There is no consensus regarding what investigation is to be done after the first episode of UTI. Many guidelines are available [4,5,25]. According to the NICE guidelines published in 2007, USG is recommended for all children below the age of six months. MCUG is recommended only if USG is abnormal or if the child has atypical UTI or recurrent UTI. No imaging is recommended in children above six months unless there is slow response to treatment, atypical UTI, or recurrent UTI [4].

The AAP in its guidelines recommend routine MCUG to detect VUR after an initial UTI in infants and young children, 2 months- 2 years [5]. The Royal College of Physicians of London (1991) recommend urinary tract ultrasonography and cystography followed by 99m Tc DMSA scan in the investigation of children presenting with a first UTI in the first year of life [25].

In our study, renal USG was abnormal only in 13% of all children. In patients with abnormal DMSA scan, renal USG was abnormal in 32.3%. This finding is similar to other studies done earlier [9]. Renal USG was also normal in the majority of the children with abnormal MCUG i.e. 62.9%. Thus although renal USG is used as an initial imaging modality, it has limited ability in detecting either acute pyelonephritis or renal scars.

Abnormal DMSA scintigraphy findings

were seen in 34 (34.3%) patients. Of these 20 (58.8%) patients had normal MCUG. DMSA and MCUG were both abnormal in 13 (17.5%) patients.

MCUG was abnormal in 27 children, (36.4%) of the patients on whom it was done. MCUG was not done in 25 patients; either it was not indicated according to the current guidelines being practised in the hospital or it was refused by the parents.

MCUG was abnormal in 31.7% of the patients who had normal DMSA. Hence to identify most of the patients with high risk factors, all three imaging modalities should at least be done.

## Conclusion

The results of our study show that ultrasonogram can be used as an initial imaging modality. But it has limited value in diagnosing acute pyelonephritis in the acute stage or in documenting scars in the delayed six month scan. Normal DMSA scan does not exclude anatomical abnormalities as 31.7% of patients who had normal DMSA scans had abnormal MCUG.

Abnormal MCUG was found in only 38.2% of patients with abnormal DMSA scans, implying that renal damage can occur even in the absence of an anatomical abnormality. 48.1% of patients with abnormal MCUG had normal DMSA scan.

Renal ultrasonography, micturating cystourethrogram and 99Tc DMSA scan should be the minimum imaging studies for the evaluation of UTI in children.

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# Introducing Discharge Instruction in Urdu language at Aga Khan University Hospital, Karachi, Pakistan

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## Introduction

It is mandatory for a modern health care professional to provide care that is evidence based, patient centered and shared in a collaborative partnership. The best health outcome depends upon accurate diagnosis and appropriate treatment. Effective clinician-patient communication is directly linked to improved patient satisfaction, adherence to suggested treatment, and subsequently, improved health outcomes.(1)

Patient education is defined as a planned learning experience using a combination of methods such as teaching, counseling, and behavior modification techniques which influence patients' knowledge and health and illness behavior.(2)

Instructions on discharging can positively impact both clinical outcomes and patient satisfaction. Providing well informed discharge instructions for postoperative patients is a fundamental responsibility of primary care providers, surgeons, and nursing staff in an acute outpatient surgery setting.(3) This first step can be augmented by additional nursing advice or consultation after patient discharge. Both of these interventions may improve patient satisfaction and enhance patient care quality. The use of standardized diagnosis-specific discharge instructions may improve patient satisfaction and care in other settings.(4) Nurse educators and managers may consider implementing this system in other units or in the outpatient (clinic) setting.

The changes in health care clearly influence how we deliver care to patients. The role of the doctors and nurse in providing patient

## Abstract

**Objective:** To describe the development of discharge instruction material in Urdu language for hospitalized patients at Aga Khan University Hospital (AKUH) Karachi, Pakistan.

**Methods:** During 2009-2010 physicians and surgeons collaborated to produce more than 45 items of discharge instruction material in the Urdu language. This written material was designed according to cultural and social norms and expectations.

**Result:** Discharge instruction materials were frequently shared with friends and family members. Readability of material was excellent and easy and in laypersons' language.

**Conclusion:** Discharge instruction as written educational material helped the patient to understand the process and health management when they reached home with the aim to impart better knowledge and attitudes to improve health.

**Practice Implication:** The routine integration of patient education as discharge instruction in all medical consultations is the ultimate goal. Practice based research is needed to improve consultation and identify and eliminate barriers to the introduction of specific discharge instruction in hospitalized patients.

**Key words:** Patient education, discharge instruction, health promotion, Pakistan

education is becoming increasingly challenging but can be performed well with some focused attention to keen patient assessment, clearly worded instructions, and effective teaching methodologies.(5,6) During 1950-2008, Pakistan's urban population expanded over sevenfold, while the total population increased by over fourfold. In Pakistan the literacy rate is 57%, out of which 69% are male and 45% female.

Urdu is most spoken formal and national language in Pakistan. Urdu has been promoted as a token of national unity. Karachi is the financial and commercial capital of Pakistan. Karachi has a cosmopolitan population composed of many ethno-linguistic groups with 48% Urdu speaking population. In Karachi there are 30 public hospitals and more than 80 private hospitals.

Aga Khan University Hospital, teaching and tertiary care private hospital is on an 84-acre campus in Karachi, Pakistan. The Aga Khan University (AKU) comprises a medical college and a school of nursing, both of which are located at their principal teaching and clinical training site and the hospital, which has 563 beds in operation, is equipped to handle medical, surgical, obstetrics and gynecology, pediatric and psychiatry patients.

In July 2006, Aga Khan University Hospital (AKUH) became the first hospital in Pakistan to receive accreditation from Joint Commission International Accreditation (JCIA), the world's leading international agency overseeing hospital standards. JCIA is a Chicago-based organization, which establishes and monitors internationally recognized practice standards in health care delivery and hospital care throughout the world. This accreditation places AKUH among the very few teaching hospitals in the world to be both ISO certified and JCIA accredited. Only three teaching hospitals outside the US have received JCIA accreditation so far. JCI standards represent a worldwide consensus on quality patient care that reflects state-of-the-art health care practices

and health care delivery trends. These Standards are based on international consensus and set uniform, achievable expectations for structures, processes and outcomes for hospitals. The accreditation process is designed to accommodate specific legal, religious and cultural factors within a country. JCI standards are truly international in their development and revision. The process of developing standards is actively overseen by an expert international task force, whose members are drawn from each of the world's populated continents.

Patient and Family Education is a subcommittee and Multifunctional Team (MFT) to the JCIA taskforce committee. The mandate of this multidisciplinary committee is to work collaboratively with health care professionals in the development/evaluation of all patient education materials and programs, promote and develop patient/family education review, discuss, revise and disseminate existing patient education materials among diversified patient populations and also conduct regular and ongoing audits/spot checks to ensure health care professionals promote patient education in their units.

### Background

Patient education and counseling involve an interactive process which assists patients to participate actively in their health care.(7) Clinical health promotion is a part of the patient education and counseling defined as that which predisposes, enables, and reinforces patients to take greater control of the non-medical determinants of their own health. (8) This is important to assess patient's educational needs first before giving them any kind of information and educational methods are selected on the basis of patient and family values and preferences.(9,10) Ongoing health needs, health promotion and disease prevention advice, will reduce the burden on the health care system in Pakistan. It is mandatory to have knowledge and good communication skills in health care providers to meet these challenges.

Discharge instructions are a form of patient education and patient communication intended to inform the patient and/or caregiver of important information related to the medical care the patient has received.(11) Commonly, discharge instructions are first delivered verbally in the context of ongoing dialog with the patient, followed by review and receipt of a written form which reinforces the previously provided verbal instructions.(12,13) Discharge instructions are provided with an expectation that patients or their caregivers, however compromised, absorb new information, learn new skills, and generate strategies for immediate self-care within a very short period of time.(14,15)

Patient and family education is any combination of activities designed to facilitate a voluntary change in patient and family behavior and awareness.(16,17) When planning individual education, the staff considers the learning needs, barriers to learning, and individual preferences of the patient.(18) The goal of patient education is the promotion of optimal health outcomes, healthy lifestyle behaviors, and chronic disease management.(19) The resources include qualified members of the health care team to teach patients and families using current materials that meet the clinical practice guidelines and standards of care.(20)

Discharge instructions must be focused and informed, with the intention of providing accurate, thorough, and effective instructions, despite the limitations of the practice setting.(21) Every contact with patients is a teaching opportunity, even the more casual conversations nurses have with patients involve nurses' ongoing assessment, teaching, and evaluation skills. (22)

Well-prepared verbal or written discharge instructions not only contribute to good communication between patients and health care providers, they also enhance postoperative home care and medication adherence. (23,24) The purpose of discharge instructions

is to provide effective strategies to ensure patients' safety and meet expectations of care. (25)

Patients who received good instructions were less likely to be readmitted to a hospital. The use of discharge instructions was one of the factors related to patient satisfaction, health provider performance, and clinical outcomes.(26) Preoperative as well as post operative standardized education should also be addressed to improve patient satisfaction. Many factors can impact patients' postoperative education. The very old patient or patients with impaired vision or hearing may require additional time and highly individualized teaching-learning strategies.(27) Increased anxiety and post surgery fatigue may decrease a patient's ability to receive and process medical advice and information. In addition, family members may lack requisite knowledge to ask relevant questions during the limited time available to discuss matters with members of the health care team.(28,29)

Patients will not be satisfied with instructions alone when their pain is undertreated or their waiting times are too long.(30,31) Although diagnosis-specific discharge instructions have standard content and format, the communication skills among educators vary. (31) Good communication skills and knowledgeable nurses may impact patient satisfaction scores more than the discharge instruction sheets.(32,33)

Assisting nurses who are new to this setting to develop the necessary skills in organization, communication, cultural sensitivity, and discharge procedures may further enhance patient satisfaction and promote quality care.(34,35) Identifying factors that impact the performance of health care organizations and continuously executing the problem-solving process to improve the quality of patient care is vital.(36) Patients expect health care professionals to provide effective care through open and honest communication and a respectful attitude.(37) Patient satisfaction is

a major quality indicator for health care providers; specific discharge instructions into the plan of care can positively impact patient satisfaction in addition to streamlining discharge procedures and standardizing educational content, and improved patient satisfaction.

### Method

In 2009-2010 according to JCIA standards specific discharge instructions in Urdu were developed for the first time in this institution. The patient and Family Education Committee, a subcommittee of the JCIA task force reviewed all material for content and guidelines were approved. The authors were mainly from the Department of Surgery, Medicine, OBGyn and Pediatrics.

Our main concern was to improve health at home when a patient is discharged from the hospital. The guideline for discharge instruction education material was included in JCIA standards. Discharge instruction was made by a group of nurses and doctors depending on need assessment, patient's and family's beliefs and values, their literacy, educational level and language, emotional barriers and motivations, physical and cognitive limitations, and the patient's willingness to receive information. A focused group comprising physicians, surgeons, nurses and clinical managers discussed the content in their meetings after extensive literature search and several brainstorming sessions. The content was finalized by the respective departments' head/ chair. Specific discharge instruction was made in English as well as in Urdu language. Our authors are bilingual and the subjects ranged from common medical problems to surgical interventions. These materials were made according to JCI standard and guidelines which were discussed, reviewed and approved by the Patient and Family Education Committee with multidisciplinary representations. These educational materials are used in inpatient services and handed over to patients when they are going home. As AKUH also provides home health care services, this is also integrated

with continuity of care at home whenever needed or requested. The final editing is done by a public affair department which not only formatted the documents but checked for language and uniformity. These discharge instructions are in printable versions available on all PCs in the wards.

Standardized materials and processes in educating patients verbal education is reinforced with written materials to enhance understanding and to provide a future educational reference. Documentation showed that written discharge instructions were given to patients and addressed: introduction regarding diagnosis, activity, diet, follow up after discharge, medications and their side effects, food and drug interactions, safe use of equipment, symptoms worsening and emergency contacts, weight monitoring, pain management and life style changes.

Multidisciplinary patient education tools in the form of discharge instruction identified learning needs and willingness of patient's, readiness and ability to learn before giving them teaching. If they cannot communicate in Urdu, a translator is called. A health care professional, usually a nurse, asks about reading or writing difficulties, and social, cultural and religious beliefs or values that will impact on illness and educational needs, literacy level of patient and any cognitive deficiency. When discharge instruction is given to the patient it is recorded in response codes, which are applied knowledge, needs reinforcement, voice understanding or returned demonstration.

Printed discharge instruction powerfully supplemented patient education making additional information available without a larger time commitment.

Health care providers and members of the JCI committee conduct regular and ongoing audits/spot checks to ensure health care professionals promote patient education in their units. Patients and family feel more secure when it is given to them and



their reaction was positive over all. These discharge instructions often initiate great interest and additional questions which is a healthy sign in health promotion and medicine adherence.

Feedback from the physician and interview with patients suggested that these instructions on discharge were found to be very useful and contributed positively to patient care. Currently 45 specific discharge instructions are available in Urdu language and many are under process. Besides specific discharge instruction there are 220 patient education materials are available out of which 121 are online on our internal website.

### Discussion

Patient education must be provided in a language and at a literacy level appropriate for the patient. Patient education should be conducted in the patient's primary language, if possible; otherwise, skilled medical interpreters should be involved.(38) Rarely are patients able to absorb all of the necessary information in a single session. We should consider strategies to integrate these patient education messages throughout the course of patient care and to engage patients in this process. Support groups, case managers, and peer educators can be invaluable in this process of engagement. It is also important to keep the medical information specific to the patient. Although there are some areas of education that should be considered for all patients, patients should not be required to have a high level of understanding in each area.(39) Patients should be given the opportunity to learn as much about an area as they would like and to retain the volume of information necessary to keep them healthy and safe.(31)

Specific discharge instruction is an effective strategy to enhance patient care and improve patient satisfaction. This will increase patient's health literacy skills, improve patient health outcomes and promote healthy behaviors, involve the patient and family in care and care decisions and

comply standards from accreditation, certification and regulatory agencies.(25,40)

Ongoing assessment of learning needs, learning preferences, barriers to learning, readiness to learn, effectiveness of education written materials verbal discussion, video practice, demonstration are among the teaching strategies. There are certain barriers like reading difficulty, writing difficulty, language/Cultural, cognition, religious, impaired vision and hearing, financial, physical (pain, fatigue, etc.) emotional (anxiety, depression, etc.) lack of motivation/unreceptive. This would be more effective if the educator sits down at eye level with the patient and starts with basic information, keeping it simple and interactive. Using teaching aids, include family members/caregivers when possible and make it easy to understand and then ask the patient to teach back what they have learned. Interpreter Services Bilingual employees/ Volunteers sometimes are needed to help.

Empower patients, families, caregivers and the public to make informed decisions and become active partners in their health care. Even when a formal health educator is available, a collaborative, multidisciplinary approach to patient education serves both patients and providers optimally. (41)

However, it is important to ensure that patient education messages are coordinated and that patients are receiving consistent information.

### Recommendation

There is need for further discharge instruction in our national language as we have discovered that patients share this information with their family members so it can be used to encourage family support and contribute to healthy behavior. The Patient Family Education Resource Center (PERC) provides a vital link between the patient and the most current information resources. This can be added to our system so the discharged patient would have more specific interaction. Medical

educators should use knowledge of patients' perceptions of care to focus teaching on areas that will help trainees to meet patients' expectations. This can be achieved only with the support of all grades of doctors in all specialties.

### Discharge Instructions

Total 90 Discharge Instructions (English 45 - Urdu 45)

1. Generic discharge instruction for all in patients
2. Generic discharge instruction for surgical patients

### Medicine

3. Tuberculosis
4. Pneumonia
5. COPD
6. Discharge Instructions for Congestive Heart Failure (CHF) Patients
7. Aplastic anemia
8. Care of patient with Anemia
9. Acute hepatitis Asthma
10. Care of Chemo patient
11. Multiple myeloma
12. Neutropenia teaching
13. AML (Acute Myeloid Leukemia)
14. GI bleed
15. Renal Failure
16. Hepatic Encephalopathy
17. Thrombocytopenia
18. Gastroenteritis
19. Hypertension
20. Diabetics
21. Hypoglycemia
22. Infected Diarrhea
23. Asthma

### Maternal and Child Health

24. Laparoscopic Ovarian Cystectomy
25. LSCS (C-section)
26. D&E - post abortion
27. Laparoscopic tubal ligation
28. Total Abdominal Hysterectomy

### Surgery

29. Ventriculo-peritoneal Shunt
30. Craniotomy
31. Lumbar Spine Surgery for Laminectomy /Discectomy
32. Transurethral Resection of the Prostate

33. Arterio-Venous Fistula
34. Care of Stoma
35. Gastrectomy
36. Laparoscopic /Open Appendectomy
37. Modified Radical Mastectomy
38. Skin Grafting
39. Thyroid Gland Surgery
40. Discharge Instructions after Coronary Angioplasty.

**Others**

41. Ascites
42. Caring for the Bedridden Patient
43. Blood transfusion
44. Endoscopies
45. Myelodysplastic syndrome

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# Assessment and Interpretation of Pediatric Cardiac Consultations

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## Introduction

It is important for the pediatrician to know how to obtain precise information regarding the patient medical history and to perform extensive physical examination in a child with heart murmur or symptoms suggesting cardiac anomaly (1). We conducted this study to evaluate the consultations referred to pediatric cardiology, in order to improve the quality of cardiac care in children.

## Patients and Methods

This is a prospective study conducted over a one year period from the first of May 2008 to the first of May 2009.

## Abstract

**Objective:** The aim of this study is to evaluate the consultations referred to pediatric cardiology, in order to improve the quality of cardiac care in children.

**Setting:** Pediatric cardiology clinic, at Queen Alia Heart Institute and King Abdullah University Hospital.

**Patients and Methods:** This is a prospective study conducted over a one year period from the first of May 2008 to the first of May 2009. All patients included in the study were referred by the pediatricians for further evaluation. Cardiac evaluations were done by a cardiologist and included: clinical assessment in addition to non-invasive and invasive diagnostic tests whenever indicated.

Patients' data and results of consultations were obtained and tabulated by the sites of referral and indications. The data were then subtabulated by the diagnosis.

**Result:** A total of 1864 consultations were seen over the study period: 725 (38.9%) from the pediatric ward, 763(40.9%) from

the pediatric clinics, 314(16.8%) from the nursery, and 62(3.3%) consults from the pediatric intensive care unit.

The most common indications for consultations were: heart murmur (368/1864:19.7%), inter-current illnesses of cardiac patients (289/1864:15.5%), cyanosis (277/1864:14.9%), assessment of the ventricular function (165/1864:8.9%) and respiratory symptoms (159/1864:8.5%).

**Conclusion:** A wide spectrum of clinical problems which needed a cardiology opinion were addressed. There were certain clinical conditions encountered more frequently and which should be given emphasis in curricula developed for pediatric residency training programs, especially how to elicit cardiac findings accurately.

**Key words:** consultation, cardiac, cyanosis, murmur, arrhythmia.

All patients included in the study were referred by the pediatrician for further evaluation. Cardiac evaluation was done by a cardiologist and included: clinical assessment in addition to non-invasive and invasive diagnostic tests whenever indicated.

Patients' data and results of consultations were obtained and tabulated by the sites of referral and indications. The data then were subtabulated by the diagnosis.

## Result

A total of 1864 consultations were seen over the study period: 725 (38.9%) from the pediatric ward, 706(41.5%) from the pediatric clinics, 214(12.6%) from the nursery and 62(3.6%) from the pediatric intensive care unit (Table 1 - next page).

The indications for consultations include: heart murmur 368(19.7%), inter current illnesses of cardiac patients 289(15.5%), cyanosis 277(14.9%), assessment of left ventricular function 165(8.5%), respiratory symptoms 159(8.5%), arrhythmias 114(6.1%), syncope 72(3.9%), syndrome 68(3.6%), chest pain 53(2.8%), rheumatic fever 48.0(2.6%), infective endocarditis 38(2.0%), cardiomegaly 31(1.7%), pulmonary hypertension

Indication of consultation	Ward	Nursery	ED	PICU	Total
Heart murmur	29	43	292	4	368
L. ventricle function	134	12	5	14	165
Arrhythmias	32	11	64	7	114
Intercurrent Illness	215	4	67	3	289
Cyanosis	45	184	38	10	277
Syndromes	12	32	23	1	68
Chest pain	4		49		53
Syncope (Dizziness)	20		52		72
Infective endocarditis	27	4	2	5	38
Pulmonary HTN	9	6	1	9	25
Recent heart surg.	6		11	2	19
Recent cath.			6		6
CVA/TIA	3		2	1	6
Hypertension	3		2		5
Surgical Clearance	17		3		20
Cardiomegaly CXR	9	2	18	2	31
Vascular Ring	7		2		9
Rheumatic fever	31		17		48
Kawasaki Disease	19		3		22
Respiratory symptoms.	97	15	47		159
Abnormal ECG	6	1	2	4	13
Fetal echo			57		57
Total	725	314	763	62	1864

Table 1: Sites and Indications For Cardiac Consultation



Diagnosis	Ward	ED	Nursery	PICU	Total
AS	2	9	0	0	11
Atrial Myxoma	1	0	0		1
ASD second.	3	23	3	0	29
AVSD	1	3	0		4
Innocent m.	5	183	11	0	199
MR	1	5	2	2	10
MS	1	1	0		2
PDA	4	18	7		29
PPS	2	2	1		5
PS	1	9	1		11
Truncus Arter.	0	2	3		5
VSD	7	17	10	2	36
VSD/CoAo	1	6	5	0	12
Others		14			14
<b>TOTAL</b>	<b>29</b>	<b>292</b>	<b>43</b>	<b>4</b>	<b>368</b>

**Table 2: Consultations for Evaluation of Heart Murmur**

25 (1.3%), Kawasaki disease 22(1.2%), surgical clearance 20(1.1%), recent heart surgery 19 (1.0%), abnormal electrocardiogram 13(0.7%), recent cardiac catheterization 6(0.3%), transient ischemic /cerebrovascular accident 9(0.5%), vascular ring 9.0(0.5%) and systemic hypertension 5(0.3%), (Table 1).

### Discussion

It is important for the pediatrician to know how to obtain precise information regarding the patient's medical history and to perform extensive physical examination in a child with heart murmur or symptoms suggesting cardiac anomaly (1). The detection of changes in cardiac auscultation, especially the presence

of murmur, is the most frequent reason for patient referral to a cardiologist followed by thoracic pain and syncope (2) which coincides with our result which showed that the most common indications for referrals were heart murmur (19.7%), intercurrent illnesses of cardiac patients (15.5%), cyanosis (14.9%), assessment of ventricular function (8.5%) and respiratory symptoms (8.5%) (Table 1).

Innocent heart murmur is a change in auscultation observed in the absence of anatomical and/or functional abnormality of the cardiovascular system, between 50% and 70% of children will at some point of their childhood or adolescence, present some changes in auscultation that

will be characterized as a murmur especially during school year.(1) On the other hand, the following symptomatology is strongly associated with cardiovascular disorder and should be adequately evaluated in a child with heart murmur: cardiac arrhythmia, syncope, cyanosis, hypoxemic spells, thoracic pain, eating difficulties, excessive sweating, intolerance to physical activity, headache, systemic hypertension, tachycardia dyspnea, edema and hepatosplenomegaly.(1).

We also looked at the site of referral. We found that in the nursery the most common cause of murmur was innocent 25.6% followed by VSD 23.3%, while in the pediatric clinic the innocent murmur was 62.7% followed

Arrhythmias	Ward	Nursery	ED	PICU	Total
Atrial	22	5	51	6	84
Ventricular	5	0	0	1	6
Junctional	1	1	1	0	3
Heart block	0	3	0		3
Normal	1	1	4		6
Palpitation	1	0	8		9
Prolonged QT	2	1			3
Total	32	11	64	7	114

**Table 3: Consultations for Evaluation of Arrhythmias**

by ASD 7.9%, (Table 2 - previous page) which means that the presence of murmur in the neonate is highly suggestive of anatomical heart lesions; it is advisable that even newborns and infants be evaluated by a cardiologist in their first year of life whenever the present symptomatology or findings on physical examination are suggestive of heart disease regardless of the existence of innocent murmur in this age group (3-6).

A total of 114 (6.1%) patients were referred because of cardiac arrhythmias, (Table 3). Both atrial and ventricular arrhythmias were seen in children, however the majority were atrial in origin and the most common was SVT.

SVT is usually associated with a structurally normal heart (7) which is in agreement with our result (Table 3) where 74% of all arrhythmias were SVT.

On the other hand atrial fibrillation occurred among older patients who typically had congenital heart disease, chronic effect of pressure overload, volume overload, or surgical scar that contributes to the development of secondary arrhythmias (8). Our result showed that atrial flutter / fibrillation occurred

in structurally abnormal hearts in 80% of cases (Table 3).

The most common basis for evaluation of function was oncology patients. Among patients evaluated for function, there were 4 new diagnoses of ASD secundum. Thoracic pain is the second commonest reason for referring a child to the cardiologist, although heart diseases are only responsible for 4-6% of such pains in children(2,9). On the contrary our study showed that chest pain as a presenting complaint in childhood is not so common. This could be explained by the fact that parents are not aware or listening to their children regarding this symptom in our society, however, the two most common causes of chest pain were muscular in 53% and idiopathic in 25%; whereas cardiac causes of chest pain occurred rarely in about 5.7% (Table 4 - opposite page).

Cyanosis in the newborn is defined as an arterial O<sub>2</sub> saturation less than 90% or a pO<sub>2</sub> less than 60 torr(10). The most common causes include intrinsic pulmonary disease, congenital heart disease and central nervous system.

Rapid diagnosis and referral are mandatory because neonatal

patients can become unstable very quickly.

Our data showed that in patients referred with cyanosis, congenital heart disease was responsible in (69%) of patients, where (31%) were non cardiac and newly diagnosed cyanotic congenital heart disease which occurred in (54%) (Table 5 - opposite page).

Transposition of great arteries (30%) is the most common cyanotic condition that requires hospitalization in the first two weeks of life (11) which coincides with our result.

The second commonest cause was tetralogy of Fallot (20%); of the four anomalies (over riding aorta, right ventricular hypertrophy, ventricular septal defect, and right ventricular outflow obstruction) only the latter two are of major physiological consequence.

Tricuspid atresia occurs where the tricuspid valve fails to develop and there is no communication between the right atrium and the right ventricle; in our study tricuspid atresia occurred in (10%).

With total anomalous pulmonary venous drainage (TAPVD), the pulmonary veins are not attached to the left atrium but converge in

Diagnosis	Ward	Nursery	ED	PICU	TOTAL
Anxiety	0	0	2	0	2
Cardiac	0	0	3	0	3
Muscular	2	0	28	0	30
GERD	0	0	1	0	1
Pulmonary	0	0	2	0	2
Idiopathic	2	0	13	0	15
Total	4	0	49		53

Table 4: Consultation for Chest Pain

Diagnosis	Ward	Nursery	ED	PICU	Total
Acrocyanosis	0	18	3	0	21
Apnea/Bradycardia	0	7	3	0	10
Cyanotic CHD(new)	12	119	16	3	150
Cyanotic CHD(known)	22	0	16	4	42
Cyanosis on crying	7	11	0	0	18
PPHTN	4	29	0	3	36
Total	45	184	38	10	277

Table 5: Consultation for Evaluation of Cyanosis

common confluence just posterior to that atrium. This confluence drains into a systemic vein or cardiac structure other than the left atrium. TAPVD occurs in (7.0%) and lastly pulmonary atresia with intact inter ventricular septum, hypoplastic right ventricle, single ventricle, double outlet right ventricle, critical pulmonary valve stenosis and hypoplastic left heart syndrome and other complex cyanotic congenital heart diseases account for about one third of cases.

In most cases rapid diagnosis and referral are mandatory. Even Koppel RI et al (12) advised that pulse oximetry screening test meets the

general requirements for a screening test for rapid diagnosis.

Current surgical therapy for most lesions has evolved from early palliation and delayed repair to complete correction in early infancy with improved morbidity and mortality (13). The evaluation of cardiac involvement in syndromic patients prompted consultations for 3.9% (Table 6 - next page). Down syndrome ranks first among referrals (38.2%) and almost half of them have congenital heart disease.

The heart was the cause of recurrent respiratory symptoms in 65/159(43%) of cases while 94/159 (57%) have a normal heart (Table 7 - page 24).

In young infants (less than 6 months), the commonest causes were VSD with or without coarctation, TAPVD and pulmonary hypertension, while myocarditis occurred more often in older infants.

Evaluation for infective endocarditis accounted for 2.2 % (Tables 1, 8). The presence of prolonged fever unresponsive to parenteral antibiotics in an oncology patient was the common reason for referral. Vegetations on 2D echo, positive blood culture and/or the presence of indwelling central venous line were the hallmark of the diagnosis and occurred in 24%, 39%, 29% respectively (Table 8 - page 25).

SYNDROME	Number	% CHD
Down Syndrome	26	50
VACTERL	5	45
Infant of DM mother	7	60
Omphalocele	4	25
Anal Atresia	4	25
Tuberous sclerosis	3	50
William Syndrome	3	100
Ehler Danlos syndrome	3	66
Marfan	2	100
Others	11	
Total	68	

Table 6: Consultation for Syndromes and Congenital Anomalies

Diagnosis	Ward	Nursery	ED	Total
AVSD	3	0	0	3
CO-Aorta+VSD	11	4	0	15
VSD	9	0	5	14
TAPVD	2	3	0	5
MR	2	0	0	2
Myocarditis	6	1	7	14
PHTN	7	3	2	12
Normal heart	57	4	33	94
Total	97	15	47	159

Table 7: Consultation for evaluation of respiratory symptoms



Fever	9
Positive blood culture	15
Central line	11
Oncology patients	17
Vegetations on 2-D echo	9
Operated CHD	5
Non operated CHD	11
Normal hearts	13

Table 8: Consultation to rule out Bacterial Endocarditis

### Conclusion

A wide spectrum of clinical problems which needed a cardiologist's opinion have been addressed. Some were encountered more frequently and should be given emphasis in curricula developed for pediatric residency training programs, especially how to elicit cardiac clinical findings accurately.

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# Infectious aortitis: A recipe for disaster

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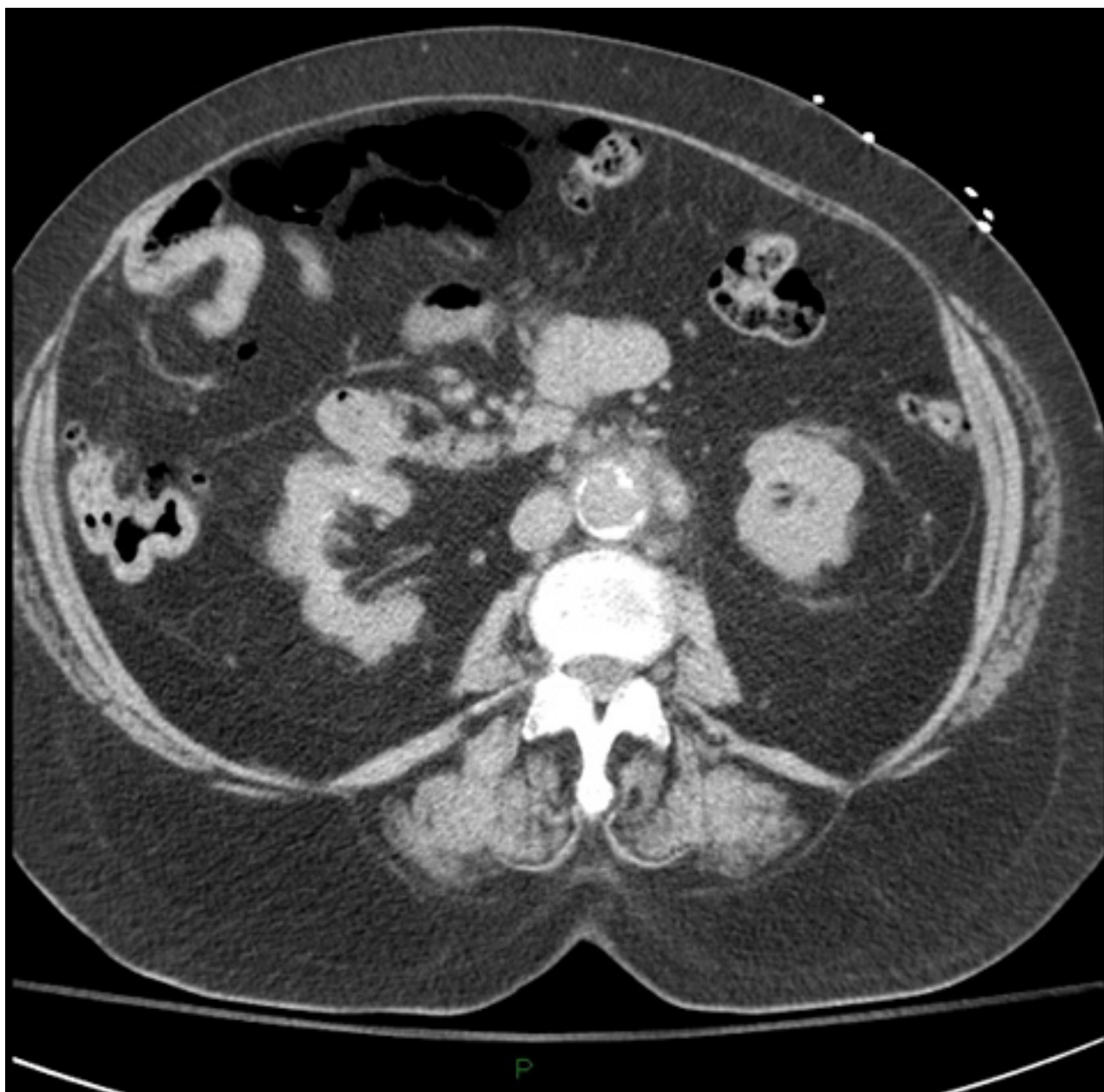
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## Abstract

Infectious aortitis is an infrequent clinical entity and this is mostly seen in association with an aortic aneurysm. There are very few documented cases of aortitis in the setting of a normal caliber aorta. Aortitis is an inflammatory process involving one or more layers of the aortic wall. Infectious aortitis can be spontaneous in origin or may occur in the setting of bacteremia, endocarditis or extension from a

contiguous site of infection. It may complicate, a pre-existing aneurysm, or post-operative course of an aortic graft. Non-aneurysmal infectious aortitis by Group B streptococci is very rare and is not well described in the literature. Clinical presentations are confusing and diagnosis prior to aneurysmal formation or rupture becomes extremely challenging. A combined treatment modality involving both

medical and surgical intervention is necessary to contain the infection and to prevent rupture of the aorta.(11) Medical therapy alone has always lead to a 100% mortality in cases of aortic rupture.



**Figure 1: Computerized tomography of the abdomen revealing Inflammatory changes along anterior and lateral aspect of abdominal aorta**

### Introduction

Infectious aortitis is an infrequent clinical entity and this is mostly seen in association with an aortic aneurysm. There are very few documented cases of aortitis in the setting of a normal caliber aorta. Our case has the paucity and fascination of having Group B streptococci as the causative agent. Only five cases of Group B aortitis have been reported in English medical literature.

### Case Report

A 79 year old lady with history of hypertension, diabetes mellitus, coronary artery disease, chronic kidney disease and recurrent

urinary tract infections and right sided pyelonephritis in the past, was admitted to the hospital with fever, chills, back pain, vomiting and diarrhea of two days duration. On examination she was afebrile (98.3F), blood pressure was elevated to >212/83 with heart rate of 89/min and saturations of 98% on room air. In the emergency room she received clonidine, enalapril and Lopressor along with intravenous hydration which decreased her blood pressure to 150/80. Physical examination was unremarkable except the left costo-vertebral angle tenderness. No abdominal bruit was appreciated.

Laboratory evaluation revealed a white cell count of 11,000cells/mm<sup>3</sup>, serum creatinine of 1.5mg/dl and glucose of 310mg/dl. ESR was elevated to 77. She had non-anion gap metabolic acidosis with normal lactate levels. The urine analysis was benign. Computerized tomography of abdomen done on the day of admission revealed Inflammatory-type changes adjacent to the lower abdominal aorta, which were new from the studies done in 3/18/2005. No aneurismal dilatation was detected. She was started on levaquin for suspected pyelonephritis. The blood cultures grew group B streptococci (Strep



**Figure 2: Computerized tomography of the abdomen from 3/18/2005, showing the absence of inflammatory cells and calcification**

agalactiae) on 2nd day of admission and antibiotic was changed to zosyn. The surgical team was consulted for suspected aortitis.

On antibiotics her white count decreased. She became pain free. She was doing better and the surgical team decided to continue conservative management. On the fourth day of her hospital stay she abruptly developed respiratory arrest and passed away in spite of the vigorous cardiac resuscitation measures.

Autopsy of abdominal aorta showed signs of marked inflammation, rupture and extensive retroperitoneal

hemorrhage. Numerous foci of acute inflammation with abscess formation were noticed, consistent with acute aortitis. Abdominal aorta revealed extensive atherosclerosis and calcifications.

#### Methods and Terminology

A computer associated MEDLINE search of English literature was performed for aortitis, mycotic aneurysms, group B streptococcus, and streptococcus agalactiae. Other sources were identified from the references of reports. Of the 17 cases of mycotic/infected aneurysms only 5 cases of mycotic aneurysms due to Group B streptococci have been reported.

#### Discussion

Aortitis is an inflammatory process involving one or more layers of the aortic wall. Infectious aortitis can be spontaneous in origin or may occur in the setting of bacteremia, endocarditis or extension from a contiguous site of infection. It may complicate, a pre-existing aneurysm, or the post-operative course of an aortic graft. It is also described in association with central catheters and other medical devices (defibrillators, pacemakers); above all it can be of idiopathic origin. (1, 2)

Common pathogens that lead to the infection of an existing aneurysm include *Staphylococcus aureus*,



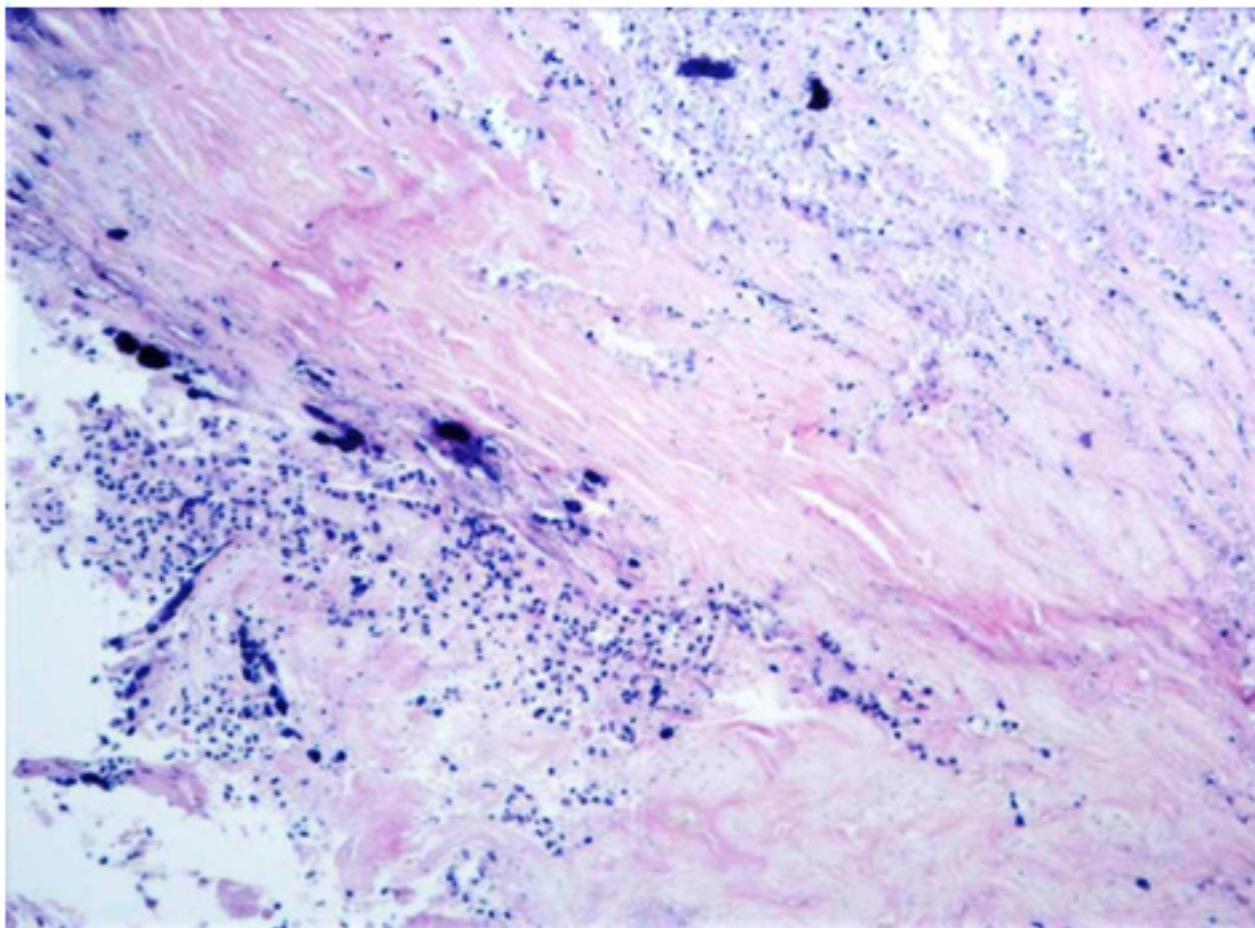


Figure 3

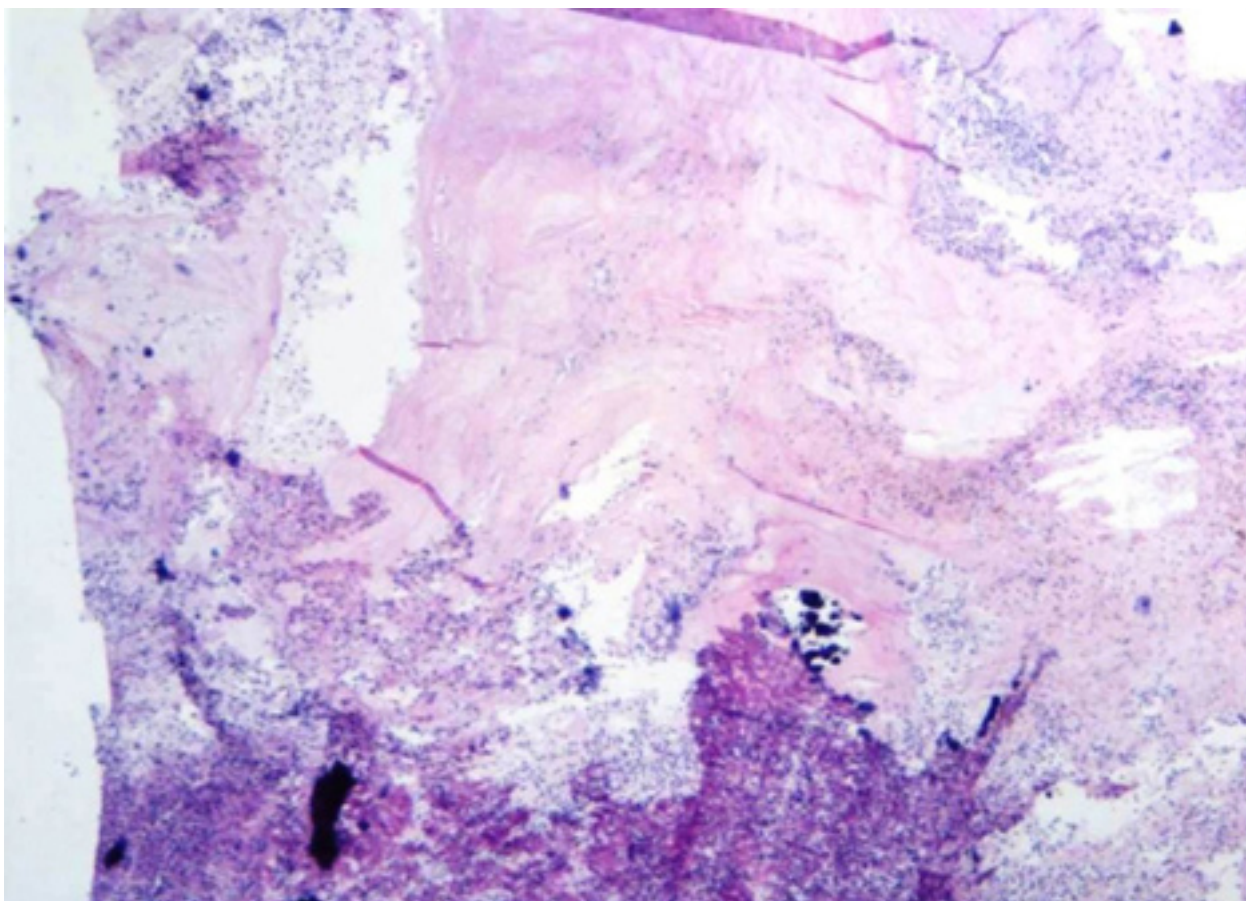


Figure 4 (Figures 3 & 4: Pathological specimens from autopsy, a section of aorta showing the abscess formation and inflammatory cell infiltration.)

to the infection of an existing aneurysm include *Staphylococcus aureus*, *Salmonella*, *Proteus* and *Escherichia coli*. Less common pathogens include fungal agents (*aspergillus* and *candida*). (3)

*Streptococcus agalactiae* is a gram-positive streptococcus belonging to Lancefield group B. These beta-hemolytic cocci constitute the normal flora of the female urogenital tract and rectum. The first human infection by *Streptococcus agalactiae* was described by Fry in 1938 as puerperal sepsis. (4)

*S. agalactiae* is the leading cause of bacterial septicemia of the newborn and neonatal meningitis in the western world. In the United States all pregnant women are screened for *S. agalactiae* and prophylactic antibiotics are given to all culture positive women. Because of this strategy, the United States has markedly reduced streptococcal infection in the new borns. (5)

Today most cases of the *S. agalactiae* infections occur in nursing home residents and age over 65 years is considered as an important risk factor. Depending on the comorbidities, mortality rate can vary anywhere from 9- 47%. A retrospective study on non-pregnant patients with *Streptococcus agalactiae* isolates in a tertiary center in Athens, Greece, identified neoplasia, diabetes mellitus, heart disease, splenectomy, stroke, chronic liver or renal disease, human immune deficiency virus infection, and corticosteroid treatment as the predisposing conditions. Mean age of the patients was 57.7 years and most common presentations were urinary tract infection followed by pneumonia and erysipelas. (6)

The first reported case of aortitis by *S. agalactiae* was reported by Blackett et al in 1989. (7) The search and review of literature showed only 5 cases of mycotic aneurysm by *S. agalactiae*. The four out of five cases occurred in males with an age range of 50-70 years. The most common site involved was the abdominal aorta (80% of the

cases). A source of infection was identified only in 60% of the cases. Blood cultures were uniformly negative in all reported cases. Fever was uncommon. All patients with abdominal aortitis underwent excision and grafting along with concomitant antibiotic therapy for three to eight weeks. The antibiotic regimens consisted of penicillin and a second agent with gram negative/anaerobic coverage. All the patients who underwent surgery had a complete recovery indicating the importance and effectiveness of surgical intervention in the treatment of infectious aortitis. (4, 8)

Diagnosis of infectious aortitis before rupture is often difficult. Clinical features are often very vague. Most commonly reported symptoms are fever, abdominal pain, and leucocytosis and positive blood cultures. On the contrary, a palpable mass or presence of abdominal bruit was rarely appreciated in an isolated aortitis in the absence of a preexisting aortic aneurysm. A high index of suspicion and an appropriate radiological investigation is the key to the diagnosis. Computerized tomography (CT) serves as a good initial investigation tool followed by serial CT scans or ultrasonography to assess the progression of the disease. Angiography is considered as the gold standard for confirmation of aortic involvement. It may also be helpful in obtaining arterial cultures. (9, 10)

The radiological findings that should raise concerns in a symptomatic patient are peri-aortic nodularity, change in the size of aorta, air in the aortic wall, irregular and thicker peripheral enhancement rim of the vessel, peri-aneurysmal gas or fluid, irregular aneurysmal lumen, saccular aneurysm in a non-calcified normal appearing aorta, associated para-aortic or psoas abscess and an adjacent vertebral osteomyelitis. Whenever possible the aorta should be explored, and tissue diagnosis should be established. (9)

A combined treatment modality involving both medical and surgical intervention is necessary to contain

the infection and to prevent the rupture of the aorta. (11) Medical therapy alone has always lead to a 100% mortality in cases of aortic rupture. (2) The in-hospital mortality rate for aortitis patients, without surgical intervention, range from 80-100%. (7) The choice of surgical technique and the surgical outcome depends on the extent of infection, the virulence of the organism and the comorbidities. (9) The two main surgical approaches are extra anatomic reconstruction and in situ graft placement. (12,13) The choice of antimicrobial agent and duration of therapy depends on the offending organism. Most of the literature suggests a minimum duration of 6 weeks of intravenous antibiotics. Some authors support 12 weeks and a year or lifelong antimicrobials in immuno- compromised patients, or aortitis associated with endocarditis or in those who are at high risk of recurrence due to presence of an indwelling device. However these recommendations lack the support of controlled trials. (14, 15)

To the best of our knowledge non-aneurysmal infectious aortitis by Group B streptococci is very rare and is not well described in the literature. Clinical presentations are confusing and diagnosis prior to aneurysmal formation or rupture becomes extremely challenging. The clinical signs may not correlate with the severity of the disease and a conservative approach may lead to an undesirable outcome. Our case underlines the importance of prompt surgical intervention in the management of infectious aortitis.

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# Importance of lead aVR in identifying high risk patients with coronary artery disease

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## Case Report

A 57-year male heavy smoker with a history of recurrent typical retrosternal chest pain starting 7 months prior, stabbing in nature and increased by exertion and decreased by sublingual nitrate and associated with shortness of breath and PND and sweating becoming progressively worse in the last month. He had a history of diabetes mellitus for 6 years and was on oral hypoglycemic therapy.

On physical examination, his blood pressure was measured at 140/80 mm Hg, and his pulse rate was 85 beats/min and regular. On auscultation, chest was clear, with normal S1 and S2. His ECG during pain, showed sinus rhythm and ST-segment elevation in leads, aVR, and ST-segment depression in leads II, III, aVF, and V3-V6 (Figure 1). The plasma levels of both troponin T and creatinine kinase-MB on admission were high: 3.0 ng/mL (reference value, 0.03 ng/mL) and 59.48 ng/mL, respectively. The other laboratory findings were normal. The coronary angiogram revealed ostial subtotal occlusion of LMCA (Figure 2). There were no critical lesions in the other major coronary arteries. The patient underwent emergency coronary artery bypass grafting (CABG).

## Discussion

The ECG in our case did not have any ST elevation in the precordial leads at all. However, it showed ST segment elevation in lead aVR, with ST depression in the inferio-lateral leads.

Gorgels et al. considered patients with ST-segment depression in leads I, II and V4-V6, and ST-segment elevation in lead aVR obtained during chest pain at rest,

## Abstract

ST segment elevation in lead aVR in the patient with typical chest pain with suspected acute coronary syndrome is very important in prediction of left main coronary artery disease. We describe rare electrocardiographic findings that suggest left main coronary artery disease.

**Keywords:** ST segment elevation, aVR, left main coronary artery

## Introduction

Acute obstruction of the left main coronary artery (LMCA) is not frequently encountered(1).

It is approximately in only 0.5% of acute myocardial infarction (AMI) cases. (2)

The clinical utility of the ECG derives from its immediate availability as a noninvasive, inexpensive, and highly versatile test.(3) The use of lead aVR for risk stratification of acute coronary syndrome has recently gained importance in the diagnosis of left main coronary artery LMCA occlusion (4) ST segment elevation in lead aVR in the patient with typical chest pain with suspected acute coronary syndrome is very important in prediction of left main coronary artery disease.(5)

In this case report, we present a case of a patient with ST segment elevation in lead aVR due to the Ostial subtotal obstruction of the LMCA.



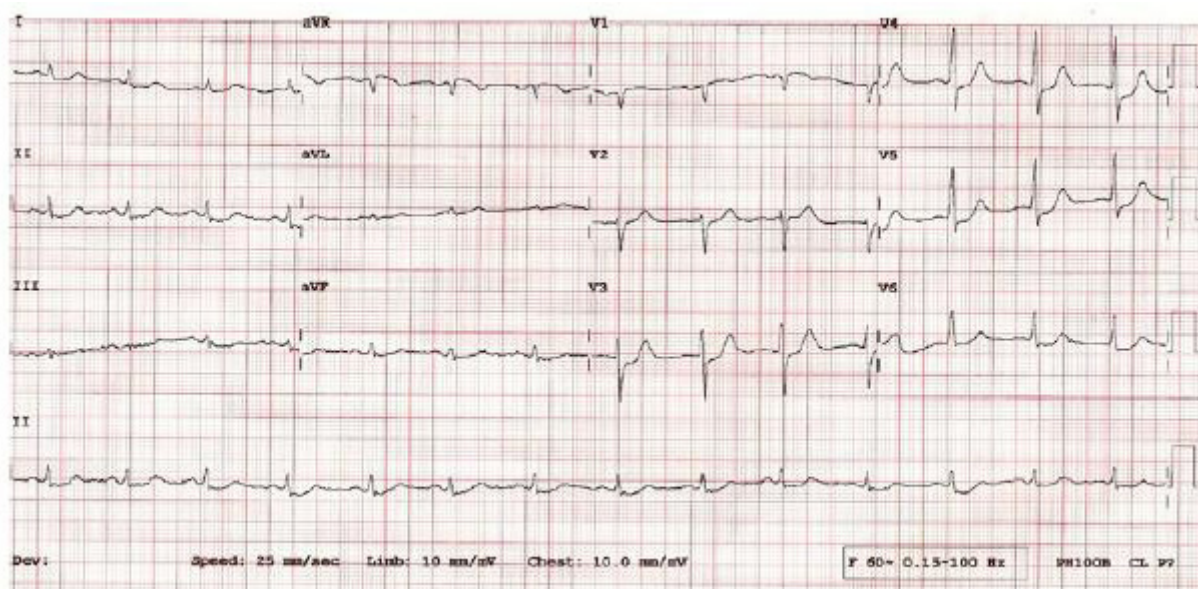


Figure 1: An ECG of the patient with LMCA occlusion which showed in lead aVR and ST-segment depression in leads II, III, aVF, and V3-V6

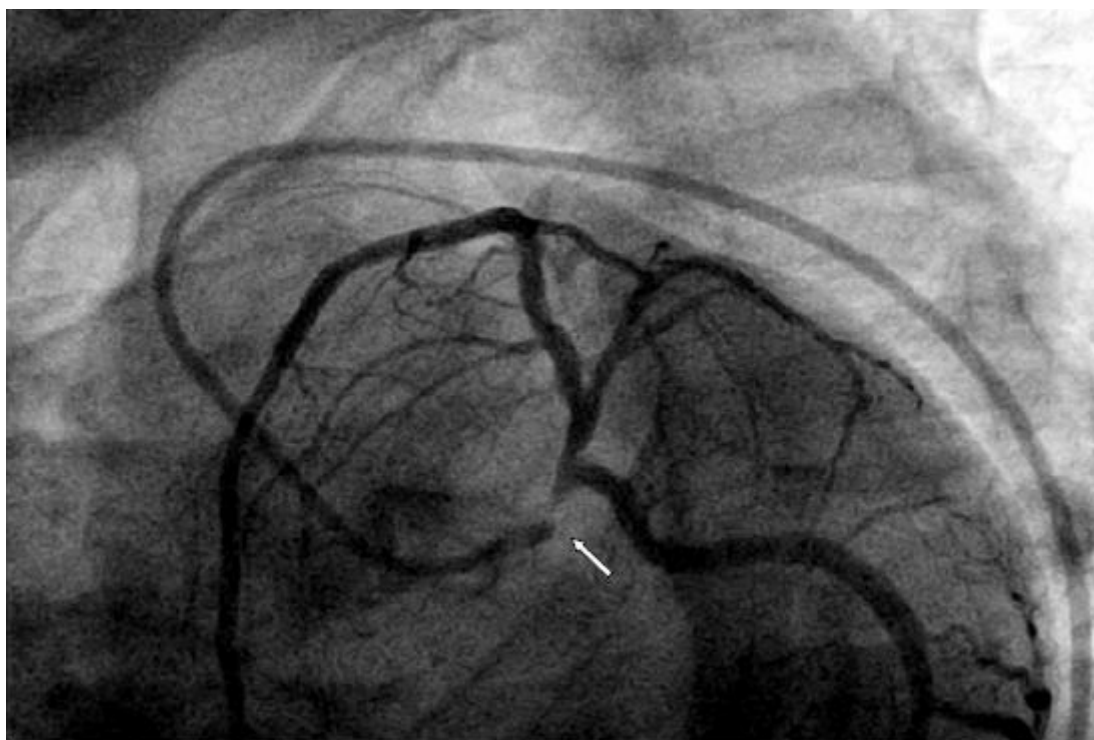


Figure 2: Coronary angiogram showed a significant ostial subtotal occlusion of LMCA (arrow) (Dr. Saleh M. Al-Awdaly, MD cardiologist)

are highly predictive for LMCA lesion or 3- vessel disease.(6) Yamaji et al. reported that lead aVR ST-segment elevation greater than lead V1, distinguishes left main coronary artery occlusion from left anterior descending artery LAD occlusion. Ischemia of the basal part of the interventricular septum is the electrocardiographic explanation for the occurrence of ST-segment elevation in these leads, as suggested by the investigator, ST-

segment depression in anterior and inferior leads, can be explained by counterbalance of electrical force from both the anterior and the postero-inferior wall ischemia resulting from an occlusion of both left anterior descending artery LAD and circumflex artery LCX respectively.(7)

ST-segment elevation in Lead aVR predicted poorer outcome and carries important short term prognostic

information in patients with a first non-ST-segment elevation acute myocardial infarction.(8)

Prompt recognition of the ECG features of LMCA occlusion in correlation with the clinical presentation is of vital importance. Hopefully with early and timely interventions, the chance of survival will improve.(5)

There are some ECG criteria demonstrated in various studies in the diagnosis of acute LMCA obstruction for different clinical settings. The ECG changes in acute left main occlusion may be different and confusing. Recognition of these changes is very important for early diagnosis and immediate aggressive treatment.(9) Thus the ability to interpret electrocardiographic tracings and identify changes suggestive of myocardial ischemia should be recognized by the medical profession.(10)

### Conclusion

The electrocardiographic sign of ST segment elevation in aVR and ST depression in lateral in 12 lead ECGs in patients with acute coronary syndrome can be used as a marker to promote an early invasive approach.

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## NOTES

