

## ORIGINAL ARTICLE

# Clinical Indication of Medical Ultrasound as a Diagnostic Tool among the Outdoor Patients of a Selected Hospital in Bangladesh

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**ABSTRACT**

**Introduction:** Medical ultrasound is used as a common diagnostic tool for the patients attending the Outpatient Department (OPD). This study was designed with an aim to determine the incidence of positive findings among the OPD patients advised for ultrasound scan. **Methods:** In this study, a group of 300 subjects between the ages of 12 and 80 years of age, examined for different types of complaints attending the OPD of Sher-E-Bangla Medical College Hospital, Barishal, Bangladesh from January 2017 to June 2018. Ultrasound brightness mode (B-mode) and color Doppler scanning were performed using Siemens NX3 and Samsung HS 70A ultrasound machines. **Results:** Mostly female patients (89.33%) attended the OPD and maximum proportion of them are pregnant (48.67%). In addition, patients attending the OPD are coming from the rural area (53.33%) more due to less access to health service at rural level. Depending on the ultrasound scanning findings different disease were diagnosed, which includes incomplete abortion (6.00%), breast pathology (2.67%), polycystic ovarian disease (3.00%), enlarged prostate (1.00%), other pathologies e.g. fatty liver, PID, sebaceous cyst, enlarged thyroid, kidney cyst, cystitis, gallstone disease, biliary ascariasis, ganglion cyst, foreign body in soft tissue, splenomegaly, hepatitis and others (16%). **Conclusion:** A number of patients (22.66%) attend OPD with complaints but they didn't have any disease detectable by ultrasound scan. Most of these patients have huge bowel gas. Due to the availability, low-cost and non-invasive useful diagnostic procedure based on medical ultrasound became popular amongst the patients.

**Keywords:** OPD, Ultrasound, Patients**Corresponding Author:**

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**INTRODUCTION**

Diagnostic ultrasound is a very common and useful technology in health industry massively used in developing countries. Ultrasound is an imaging technique in which a transducer, lubricated with a gel, is used to get image (1). In early 1960s ultrasound was first used in medical field but now it is used in many medical fields like in anatomical imaging, blood-flow measurement, and all aspects of physiological medicine (2). Diagnostic ultrasound is more essential because it can send highly flexible imaging modality of most the body parts for medical practice and it is also very safe to use (3). Ultrasonography is very much useful to diagnose uterine malformations that lead to abnormal uterine bleeding in women (4). Diagnostic ultrasound has become very much eminent for its small size, less expensive, and no radiation and easier to use. It is also used as a diagnostic and prognostic tool in surgery that

facilitates in clinical practices (5). In gynecology and obstetrical practice ultrasound is considered as the primary imaging modality for the determination of fetal wellbeing (6). Ultrasound technique is widely used in diagnosis of different body parts namely hepatobiliary disorders, renal disorders and others (7). Contrast enhanced ultrasound (CEUS) was first initiated in 2004 by the European Federation of Societies for Ultrasound in Medicine and Biology is very much popular in United States Food and Drug Administration (FDA) approval as well as the extensive Asian experience, to produce a truly international perspective (8).

In addition, the significance of ultrasound is in detecting the disease, where expectant management (surgical or medical) and follow up have been designed with ultrasound. So, patients attending at outpatient department (OPD) are advised for ultrasound scan as a routine investigation not only in developing countries but in urban areas also (9). Medical practitioners should always be encouraged the use of diagnostic ultrasound for medical benefits and discouraged for non-benefits (10). This is the reason to carry out this study among the OPD patients to elicit the clinical indications.

## MATERIALS AND METHODS

### Study setting

This study was conducted among the patients attending the OPD of Sher-E-Bangla Medical College hospital (SBMCH), Barishal, Bangladesh. SBMCH is in Barishal, a divisional city of Bangladesh, about 200 km away from the capital Dhaka. SBMCH is 1000 bedded hospital and the only tertiary level teaching hospital in this region that handled about 30,000 patients annually (11); among these about 40% are attended the OPD. People from the Barishal city and surrounding areas come to this hospital for medical and surgical treatment.

This research work is approved by the Medical Research Ethics and Management committee of Apollo Diagnostic Complex Pvt. Ltd., Barishal, Bangladesh, vide Memo no. ex/01/2017 dated: January 03, 2017.

### Study design

This study was performed among the OPD patients, using convenient sampling method from January 2017 to June 2018. The questionnaire was developed based on journals, articles, newspapers, books, media, internet and discussion. The study focused on socio-demographic status, gender, medical history, clinical indication and findings of ultrasound scan. Interviews of the patients were done using a pre-designed questionnaire to collect the demographic and medical history; ultrasound findings were determined by scanning patients using Siemens NX3 and Samsung HS 70A ultrasound machines at a private setting following standard guidelines (12). A pilot study was performed to find out the points of questionnaire to be revised and improved. Finally, a structured and open-ended questionnaire was developed to collect data.

### Sampling

The study subjects were made up of consecutive 300 patients attending OPD of Sher-E-Bangla Medical College Hospital aged 12 years to 80 years who were advised for ultrasound scan.

### Data collection

The data was collected from the patients attending the OPD of Sher-E-Bangla Medical College Hospital who were advised for ultrasound scan. Before collecting the data, the objective and procedure of the study was discussed with the patients and informed consent was obtained. Data was collected only if they were interested.

### Data and variables

Questionnaire were subdivided in some basic segments as sociodemographic data, medical history and ultrasound scan findings. Clinical indications were taken from the advice slip. Different findings were observed according to clinical indication; e.g. pregnancy, incomplete abortion, PCOD, enlarged prostate, though

a good number of patients didn't have any finding detectable in ultrasound scan. Pregnant patients were categorized with decreased amniotic fluid, small fetus for gestational age and others.

## RESULTS

During the study period, 300 patients were investigated of which 89.33% were female and 10.67% were male. The ages of the patients ranged from 12 years to 80 years. The age range of 20~30 years had the highest frequency (49.34%). This was followed by 31~ 40 years which had a frequency of 25.33%. The lowest frequency was found in ages above 40years which had a frequency 10.67%. Patients attending the OPD from urban area (Barishal city) constitutes 46.67%, while 53.33% came from rural area. Patients were from different professions, but they were mainly housewife (85.67%). Rest of professions were daily workers (05.33%), farmer (04.67%), student (02.67%), and employee (01.66%) [Table I].

**Table I: Characteristics of study sample (n=300)**

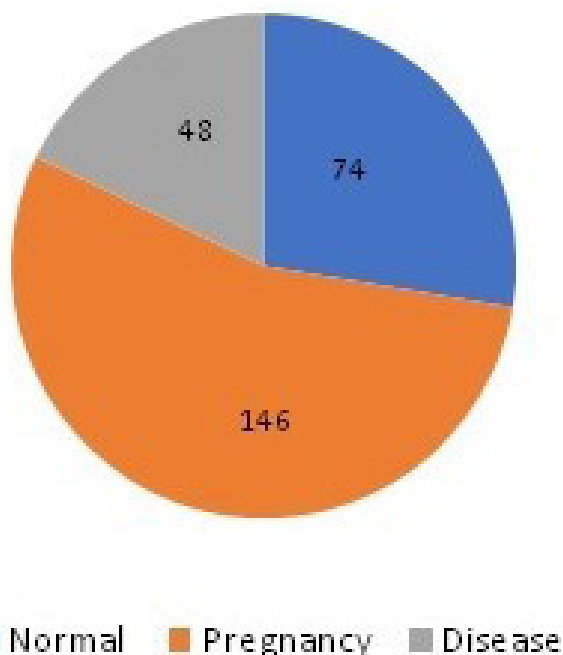
Parameters	Total (Percentage %)		
<b>Gender</b>			
Female	268 (89.33%)		
Male	32 (10.67%)		
<b>Age ranges (year)</b>	<b>Female</b>	<b>Male</b>	<b>Total</b>
Below 20	40 (13.33%)	4 (1.33%)	44 (14.66%)
20 ~ 30	140 (46.67%)	8 (2.67)	148 (49.34%)
31 ~ 40	58 (19.33)	18 (6.0%)	76 (25.33%)
Above 40	26 (8.67)	6 (2.0%)	32 (10.67%)
<b>Occupation</b>			
Housewives	257 (85.67%)		
Daily workers	16 (05.33%)		
Farmers	14 (04.67%)		
Students	08 (02.67%)		
Employee	05 (01.66%)		
<b>Location</b>			
Urban area	140 (46.67%)		
Rural area	160 (53.33%)		

Patients were attending OPD with different complaints. Depending on ultrasound findings patients were identified with pregnancy (48.67%), other diseases (28.66%) and (22.67%) didn't have any disease that could be identified by ultrasound scan. Common clinical indications of ultrasound scanning were incomplete abortion (6.00%), breast pathology (2.67%), polycystic ovarian disease (3.00%), enlarged prostate (1.00%) [Table II]

Female patients are mainly attending OPD and they constitute (89.33%) of whom, most of them attended with pregnancy or pregnancy related complaints (54.48%); approximately 17.91% patients were suffering from other diseases, while 27.61% didn't have any disease diagnosed by ultrasound scans [Figure 1]

**Table II: Medical history/clinical indications of the patients and findings in ultrasound scan**

Parameters	Number of patient (Percentage)
<b>Medical history/clinical indication</b>	<b>Total (%)</b>
Amenorrhoea	161 (53.67%)
Pain in the abdomen	80 (26.67%)
Pervaginal bleeding	23 (07.67%)
Breast pain/lump	16 (05.33%)
Difficulty in void urine/retention of urine	08 (02.66%)
Others	12 (04.00%)
<b>Findings in ultrasound</b>	<b>Total (%)</b>
Normal	68 (22.66%)
Pregnancy	146 (48.67%)
Incomplete abortion	18 (06.00%)
Breast pathology (fibroadenosis, fibroadenoma etc.)	08 (02.67%)
Polycystic ovarian disease (PCOD)	09 (03.00%)
Enlarged prostate	03 (01.00%)
Others (fatty liver, PID, sebaceous cyst, enlarged thyroid, kidney cyst etc.)	48 (16.00%)



**Figure 1: Distribution of diseases among female patients attending OPD**

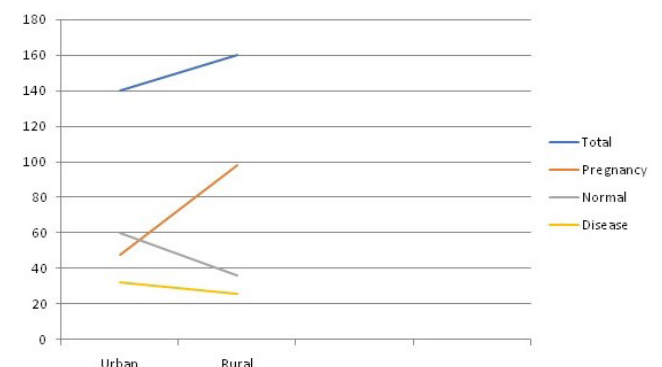
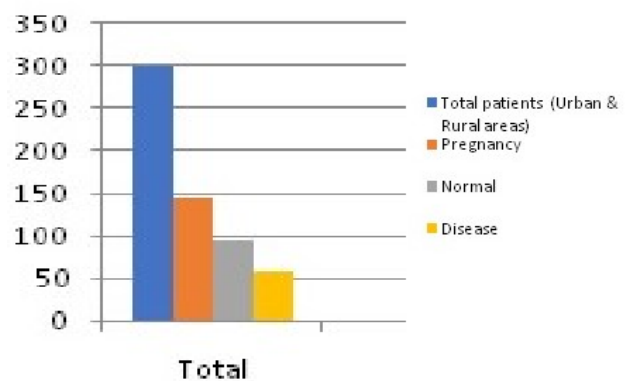
Pregnant patients are attending the OPD for the routine antenatal checkup and pregnancy related problem and complications. Depending on the sonographic features and findings of pregnancy scans, pregnant patients were identified as; normal (48.63%), decreased amount of amniotic fluid or oligohydramnios (33.57%), small fetus for gestational age (14.38%) and placenta praevia (3.42%) [Table III].

An important relationship is seen regarding the location of patients with their clinical indications and findings. Patients coming from rural area are more in number

(53.33%) than those of urban area (46.67%). Clinical findings are more in rural patients [Figure 2]

**Table III: Medical history/clinical indication of pregnant patients and findings in ultrasound scan**

Parameters	Number of patient (Percentage)
<b>Medical history/clinical indication</b>	<b>Total (%)</b>
Amenorrhoea/antenatal check up	79 (54.11%)
Leaking membrane	28 (19.18%)
Less fetal movement	19 (13.02%)
Pervaginal bleeding	09 (06.16%)
Pain	08 (05.48%)
Others	03 (02.05%)
<b>Findings in ultrasound</b>	<b>Total (%)</b>
Normal pregnancy	71 (48.63%)
Decreased amount of amniotic fluid or oligohydramnios	49 (33.57%)
Small for gestational age	21 (14.38%)
Placenta praevia	05 (03.42%)



**Figure 2: Distribution of patients depending on location**

## DISCUSSION

This study intended to determine the clinical indication of medical ultrasound to ratify its use as a diagnostic tool. However another study shows that training in ultrasound-guided procedures may reduce the use of landmark techniques and improve patient safety (13). In this study a total of 300 patients were scanned in a

private setting following the protocol of AIUM between the period of January 2017 and June 2018.

The study showed that the patterns of disease have been found to vary according to the sociodemographic factors (sex and age), and in this study sample the highest incidence of patients ranged 20~30 years with the highest frequency of 148 (49.34%). This was followed by 31~40 years which had a frequency of 76 (25.33%) patients.

There were more females than males in this study. It was clear that the women were attending OPD more during their pregnancy for the evaluation of fetal wellbeing. Internationally, it is true too that ultrasound scanning during pregnancy is one of the most important aspects of their antenatal care (14). This study showed that among the total patients (46.67%) in the urban area of Barishal city, the diagnosis was pregnancy (34.28%), other disease (22.86 %) and non-disease (42.85 %), while result of patients from rural area (53.33%) reflected that pregnancy (61.25%), other disease (16.25%) and non-disease (22.50%). Pregnant patients were attending due to antenatal visit (48.63%), decreased amount of amniotic fluid or oligohydramnios (33.57%), small fetus for gestational age (14.38%) and placenta previa (3.42%). Result of this study showed that consciousness is developing among the women especially in rural area; therefore, they are attending OPD during their period of pregnancy for antenatal checkup. Decrease amniotic fluid or oligohydramnios is the second important reason to attend OPD during pregnancy. Besides pregnancy patients are attending OPD for other disease like incomplete abortion (6.00%), breast pathology (2.67%), polycystic ovarian disease (3.00%), enlarged prostate (1.00%).

One important finding of this study is that, 22.66% patients attended OPD but didn't have any disease that could be diagnosed by ultrasound scan. So, these patients are directly released from the hospital and does not need any further diagnosis or treatment.

## CONCLUSION

A big number of patients are attending the OPD during their pregnancy for antenatal checkup. Medical ultrasound is the choice of investigation for identifying fetal wellbeing and other pregnancy related problems and complications. Ultrasound is also a useful diagnostic tool specially for diagnosis of incomplete abortion, enlarged prostate and some abdominal problems like fatty liver, cystic disease in kidneys and other such conditions. Due to the availability, low-cost and non-invasive useful diagnostic procedure medical ultrasound has become popular amongst the patients.

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