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EDITORIAL

WFUMB Center of Excellence: Bangladesh

Kanu Bala

World Federation for Ultrasound in Medicine & Biology [WFUMB] is a Federation of Affiliate Organizations consisting of Regional Federations of the National Societies for Ultrasound in Medicine & Biology. The Regional Federations cover National Societies of Ultrasound in Asia, Europe, Latin America, Africa, North America and Australasia. Individual members of the National Societies are Physicians, Scientists, Engineers and Sonographers. The total number of individual members is presently more than 43,000. WFUMB is a Non-Government Organization in official relation with World Health Organization [WHO]. Diagnostic ultrasound originated almost simultaneously in three areas namely – United States, Europe and Japan in 1950s. Naturally discussions on ultrasound at an international level was necessary. The First WFUMB Congress was successfully held in San Francisco in 1976, hosted by AIUM. After the first event, WFUMB Congress has been smoothly and successfully organized in various cities around the world every 3 years.

The Federation has the following main activities:

- WFUMB organizes World Congress in Ultrasound every three years covering the whole field of diagnostic ultrasound.
- As a Non-Government Organization in official relation with the World Health Organization, WFUMB and WHO currently collaborates on various education programs by organizing and sponsoring courses and working for the creation of education centres and reference materials.
- WFUMB sponsors congresses and courses in certain situations.
- WFUMB organizes and sponsors workshops on safely of ultrasound in medicine.
- The official journal of WFUMB, 'Ultrasound in Medicine & Biology' published monthly.
- WFUMB News Letter is published twice a year.
- Establishing WFUMB Centers of Excellence in the different regions of the world.

Because of the increasing demand for education and training for ultrasound in medical practice, the WFUMB decided to establish 'WFUMB Centers of Excellence [WFUMB COE]' at certain places in the developing counties of the world. The aims of the WFUMB COE shall be to conduct education in medical ultrasound in developing countries; to confer accreditation after necessary examination; and to accumulate current technical information on ultrasound;
under close communication with the other Centers, WFUMB.

The first term of the establishment shall be 3 years, which may be renewed after the reevaluation for every 3 years. An Advisory Board for the WFUMB COE shall advice the Centers for their administration.

A WFUMB Affiliated Society may be a candidate for the WFUMB COE. The Society should be an established organization; with an independent office; should have sufficient

experiences on education for ultrasound and should have ability to attract trainees not only from the own country but also form the surrounding countries. The administration of the Center should be initiated by the concerned society/ taking advice from the Advisory Board. The WFUMB COE should conduct at least one training program every year. It is advisable to organize the program once every year for general trainees and another once every year for candidates to be a teacher of ultrasound.

Bangladesh is the first country for becoming the candidate for First WFUMB Center of Excellence. Prof. Hiroki Watanabe, Chairperson of the Advisory Board for WFUMB Centers of Excellence, is the main man for offering this honor to the BSU. One Secretary is appointed for the Center, who represents the Center and the Secretariat should be in the office of the BSU. First WFUMB COE Workshop is going to be held in the City of Dhaka on 24, 25 & 26 February 2004. Prof. Hiroki Watanabe - Japan, Prof. Byung Ihn Choi - South Korea, Prof. Leandro Fernandez - Venezuela, Prof. M. P. Sharma - India and six lecturers from Bangladesh are going to deliver lectures on various topics of advanced ultrasound. The Executive Body of the BSU has formed an Organizing Committee for this purpose.

Dr. Kanu Bala
Chairman of the Journal Committee
Bangladesh Journal of Ultrasonography

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ORIGINAL ARTICLE

Urinary jet index for evaluation of differential renal function

Nurun Nahar, Jasmine Ara Huque, Sadia Sultana, Faisal Kabir & Mizanul Hasan

24 hours creatinine clearance rate (CCR) and glomarular filtration rate (CFR) are usually done for assessment ot total renal function. For assessment of differential renal function isotope renogram, DMSA renal cortical scan and GFR by gamma camera technique are established procedures. Urinary jet index (UJI) is a newly developed technique done by colourdoppler ultrasonography to evaluate individual renal function and seems to be promising. Patient is hydrated by twoglasses of water half an hour before study and urinary bladder is moderately filled. Transverses can of urinary bladder isthen done by colour doppler ultrasonography and number of urinary jets on each side are counted for 5 minutes. UJI is calculated by the following formula:

$$UJI - \frac{\text{No of Rt sided jets X 100}}{\text{Total no of jets (Rt + Lt)}}$$

This is a preliminary study done at the Institute of Nuclear Medicine & Ultrasound (INMU), Dhaka. Patients with different renal problems and a number of volunteers without anv known renal problem were included in the study. Colour Doppler USG was done for determining urinary jet index and the results were then correlated with the findings of isotope renogram and! or CFR. The initial experience of the study is reported.

When urine enters the urinary bladder from ureteric orifices, urinary jets can be detected both in gray scale and colour Doppler sonography. Colour Dopplersonography is particularly sensitive i-[2,] Different studies demonstrated that sonographic detection of urinary jet is due to slight density differences between the urine already inside the bladder and hat entering into the bladder[345] Usual clinical applications of urinary jet identification are: a) assessment of normal urodynamic physiology (6), screening and confirmation of renal obstruction[789], detection of anomaly in uretericorifices in children with suspected vesicoureteric reflux [1011.]

Uretetic jet index is a newly developed technique derived from colour Doppler USG for evaluation of renal function and can be calculated by two formulae 12.13.14

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Formula I (simple), $UJI = \frac{\text{(No of Rt sided jets XI 00)}}{\text{Total no of jets (Rt + l.t)}}$
(for differential function only)

Formula II, (for differential & total function)

UJI (unilateral) = V mean X F x D;
F = Jet frequency
D = Jet duration
V mean = Average jet velocity

Creatinine clearance rate (CCR) and Glomarular filtration rate (GFR) are used for evaluation of renal function. For differential renal function isotope renogram, DMSA renal scan and GFR estimation by Gamma Camera Technique are used (15). The aim of the study is evaluation of an index (urinary jet index) for differential renal function based on the quantification of the ureteric jets seen on colour Doppler ultrasound of the bladder and comparison of Doppler "Jet index" with “Scintigraphic index” assessed by DTPA renogram which is used as gold Standard.

Results show that ureteric jet index may be promising in evaluating differential renal function.

MATERIALS & METHODS

Total thirty six subjects were selected for the study. Among the thirty six subjects, twenty four were patients with different renal problems and referred to INMU for isotope renal study. There were twelve volunteers. Minors and patients with transplanted kidney were not included in this study. Renogram and/or GFR was performed with 99mTc-DTPA. Scoring of both ureteric jet index and scintigraphic index was performed with respect to right kidney. Colour Doppler ultrasonography and isotope renal studies were performed in the same day or within a week, either study done before. Preparation of patients before colour Doppler ultrasonography were well hydration (2 glasses of water 30 mins before study) and adequately full urinary bladder. Peritrigonal region of urinary bladder was scanned in transverse plane and ureteral jet was localized. Moderate colour gain setting was used. Sonologist was blind about the history and scintigraphic findings. The number of urinary jets from each orifice, regardless of duration was counted over a period of five minutes. Urinary jet index was calculated only using the 1st formula. Differential score was expressed with respect to the right ureteric orifice. The urinary jet index was scored by normalizing the score for the right ureteric orifice by the total number of jets for both sides and expressing this as a percentage. Thus the jet index was calculated by the formula 1 mentioned earlier.

Isotope renogram was reported by nuclear medicine specialist, who was unaware of the findings of urinary jet analysis. Divided renal function was calculated by Patlak-Rutland graphical analysis after background subtraction(16). Relative renal function was calculated with reference to the right kidney and that was the 'scintigraphic index'

In some patients undergoing DTPA renographv, GFR were also calculated bv gamma camera method.

Values for the right scintigraphic and right ureteric jet index were then compared. Discrepancy between these two indices were calculated. Statistical analysis bv correlation coefficient 'r' was done.

RESULT

Ureteric jets could be identified in thirty two out of thirty six subjects (88.y9"(i) and recorded satisfactorily. Among two patients where urinary jet could not be identified had bilateral gross hydronephrosis in one and severe chronic renal failure in the other. Mean number of jets in 5 minutes was 6.75 (1.35/min) on left side with a range of Zero to 16 and 7.5H (1.52/mm) on rignt side with a range of Zero to 17.

Mean jet index on right side was 51.92 (n=32, SD= 24.51). Mean scintigraphic index on right side was 50.67 (n=32, SD= 19.93).

Correlation coefficient 'r' was 0.79 (p value <0.001) which is highly significant. Absolute discrepancy between Doppler index and scintigraphic index was more than 20 in two patients (5.55 %), 10-20 in 12 patients (33.33 ";.)and less than 10 in 22 patients (61 %).

DISCUSSION

Clinical importance for evaluation of UJI are; assessment of normal urodynamics physiology screening and confirmation of renal obstruction, detection of vesico-ureteric function anomalies etc. Factors that can have effect on ureteric jet index but not on scintigraphic index are.; urinary tract obstruction, lise of intravenous diuretics, abnormal vesico-ureteric junction like malposition etc.

Evaluation of ureteric jet index is a very simple test and can be performed in any department equipped with colour Doppler ultrasonogram

machine. This test correlates well with scintigraphic index and are encouraging. Scintigraphic index is considered as a gold standard. We observed absolute discrepancy more than 20 in only two patients (5.55 %) which were cases of severe hydronephrosis, in 12 patients (33.33 %) discrepancy was 10-20 and in 22 patients (61 %) discrepancy was less than 10. In most of the cases where there were significant discrepancy (more than 10), had confounding factors like obstruction and could be easily detected by conventional ultrasonographv. This is a complementary test to a conventional renal tract ultrasonography. There are several wav? by which measurement of a jet index could be improved. These are longer scan time, different jet volumes and duration's of urinary jets and to avoid frequent voiding before doppler study.

CONCLUSION

This is a preliminary report of a ongoing study in INMU. Though there are number of limitations, results are satisfactory. This might be a practical technique which could be useful in the context of conventional urinary tract ultrasound. Relative renal function can be easily assessed by this simple test. Large number of study subjects with calculation of ureteric jet index using the 2nd formula i,e UJI= V mean X D x F will probably improve results.

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