Ultrasonographic and Doppler Assessment Of The Endometrium In Patients With Postmenopausal Bleeding

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*** قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم ***

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Abstract

The present study emphasizes the importance of the combined examination using transvaginal ultrasonographic endometrial examination and Doppler velocimetric study of the uterine artery to increase the diagnostic accuracy and to decrease as much as possible the false results that may occur in either of them alone.

Fractional curettage is still needed in cases with postmenopausal bleeding for the diagnosis or the exclusion of a definite endometrial pathology.

Key words

Postmenopausal bleeding.

Transvaginal ultrasonograpy.

Transvaginal Doppler.

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Abbreviations

Abbreviation	*Details*
CT	Computerized tomography
CW Doppler	Continuous-wave Doppler
D&C	Dilatation and curettage
ERT	Estrogen replacement therapy
FSH	Follicle-stimulating hormone
GnRH	Gonadotropine releasing hormone
HRT	Hormonal replacement therapy
IU/L	International unit per liter
IVF & ET	In vitro fertilization and embryo tansfer
LH	Luteinizing hormone
mg	Milligram
MHz	Mega Hertz
Mm	Millimeters
ng/ml	Nanogram per millimeter
NSAID	Non steroidal anti-inflammatory drugs
Pap test	Papinecleou test
pg/ml	Pictogram per millimeter
$PGF_{2\alpha}$	Prostaglandin $F_{2\alpha}$
PI	Pulsatility index
RI	Resistance index
S/D ratio	Systolic diastolic ratio
TV Doppler	Transvaginal Doppler
TVS	Transvaginal sonography
U/S	Ultrasonography

Introduction

Menopause is defined as the permanent cessation of menses for more than 1 year and is physiologically correlated with the decline in estrogen secretion resulting from the loss of follicular function. So postmenopausal bleeding is defined as bleeding from the genital tract after the cessation of menstruation for more than 1 year ***(William, et al. 2002).*** It is one of the most common problems affecting women after menopause.

The main causes of postmenopausal bleeding are:

Atrophic endometritis and vaginitis, endometrial cancer, endometrial or cervical polyps, endometrial hyperplasia, use of exogenous estrogen as a hormonal replacement therapy, and miscellaneous (e.g. cervical cancer, uterine sarcoma, urethral caruncle, trauma) ***(Hacker and Moore. 1998).***

Diagnosis of the cause of the postmenopausal bleeding can be made by the use of different diagnostic procedures of which transvaginal sonography, Doppler and fractional curettage are the most important ***(Paula, 2002).***

Transvaginal sonography:

Its use was first suggested in 1966 ***(Mizuno, et al. 1966)*** but was not seriously considered at that time. The method was proposed again in 1969 and 1983 with the first application in follicular growth and then aspiration technique for ovum retrieval ***(Dellenbach, et al. 1984).*** Up to this time, vaginal probes carrying transducers of 3 to 5 MHz were used ***(Schwimer, et al. 1985).*** The use of high-frequency TVS was first reported in 1986 ***(Timor-Tritsch, et al. 1986).***

In 1987, the first proposed TVS to replace abdominal sonography for the evaluation of gynecologic and first trimester problems appeared ***(Rottem. 1993).***

Two new developments were the introduction of pulsed Doppler in 1988 ***(Deutinger, et al. 1988)*** and color flow mapping in 1989 ***(Kurjak, et al. 1989).***

The success of this now widely used method comes from the combination of the closest approach to the organ in question and the employment of high frequency transducers. So TVS can be used for detection of pelvic pathology, hemodynamic measurement of the female pelvic vessels both in pregnant and nonpregnant state and in different TVS guided procedures (e.g aspiration of tubal pregnancy) ***(Rottem. 1993).***

Transvaginal Doppler:

It has been stated that blood flow measurements are critical to studies of organ functions ***(Van Orden et al.1984).***

In medicine, the noninvasive method of choice for quantifying changes in blood flow is to quantify changes in Doppler ultrasound waveforms. Thus the further study of alternations of uterine and ovarian arteries Doppler waveforms in the presence of physiologic and pathologic processes could prove to be clinically useful ***(Christopher, 1988).***

In 1985, Taylor et al. postulated that Doppler signal analysis could be important in detection of the presence or absence of flow in a structure, more quantitative description of time-velocity waveforms and Doppler spectral content and estimation of absolute volume flow ***(Taylor et al. 1985).***

Fortunately, for the uterine and ovarian arteries it is possible to detect a signal with a characteristic pattern that is fairly specific to the particular vessel or even the vessel site.
Moreover, changes in perfusion through these vessels results in changes in waveform shape and they can be detected easily. Thus the measurement of absolute volume flow, with its potential for error, is not necessary ***(Christopher, 1988).***

Initial Doppler recordings of uterine and ovarian arteries were made via the transabdominal vesical route using a pulsed duplex system.
The uterine artery Doppler signals were obtained more accurately via the abdominal than the vaginal route ***(Taylor et al. 1985).***

Goswamy used an abdominal offset pulsed-wave Doppler transducer with a mechanical sector imaging transducer to obtain Doppler signals from the ascending branch of the uterine artery during normal menstrual cycles.
It was noted that in most cases changes associated with decrease in uterine artery impedance were associated with rising levels of estradiol and progesterone. However increasing the volume of urine in the bladder produced flow velocity waveforms associated with higher uterine artery impedance ***(Goswamy and Steptoe. 1988).***

Fractional curettage:

Probing of the uterine cavity was practiced by the ancient Egyptians to insert various substances into the uterus. In the early 1800s, the uterine sound was used to probe the uterine cavity for diagnostic purposes. In the past, the cervix was dilated with rubber dilators, sponge tents, or laminaria. These techniques were not optimal and the use of laminaria was associated with a high rate of infection ***(Steven. 1993).***

Hegar (1879) is credited with the development of graduated metal dilators that could safely and effectively dilate the cervix. The uterine curette was introduced in 1842 by Recamier but initially was not well accepted because the inventor reported complications with its use as uterine perforation with resultant peritonitis. The procedure finally gained acceptance when it was reinforced almost 30 years later. Over the past century, the combination of cervical dilatation and uterine curettage has become one of the most commonly performed surgical procedures in all medicine ***(Steven. 1993).***

In fractional curettage, endocervical curettage is done (for detection of cervical pathology) followed by cervical dilatation and uterine curettage (for detection of uterine pathology).