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Determination of Gestational Age by Ultrasound

This clinical practice guideline has been prepared by the Diagnostic Imaging Committee, reviewed by the Family Physician Advisory Committee, and approved by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

PRINCIPAL AUTHORS

Kimberly Butt, MD, Fredericton NB

Ken Lim, MD, Vancouver BC

DIAGNOSTIC IMAGING COMMITTEE

Ken Lim, MD (Chair), Vancouver BC

Stephen Bly, MD, Ottawa ON

Kimberly Butt, MD, Fredericton NB

Yvonne Cargill, MD, Ottawa ON

Greg Davies, MD, Kingston ON

Nanette Denis, RDMS, Saskatoon SK

Gail Hazlitt, RN, RDMS, Winnipeg MB

Lucie Morin, MD, Montreal QC

Annie Ouellet, MD, Sherbrooke QC

Shia Salem, MD, Toronto, ON

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Abstract

Objective: To assist clinicians in assigning gestational age based on ultrasound biometry.

Outcomes: To determine whether ultrasound dating provides more accurate gestational age assessment than menstrual dating with or without the use of ultrasound. To provide maternity health care providers and researchers with evidence-based guidelines for the assignment of gestational age. To determine which ultrasound biometric parameters are superior when gestational age is uncertain. To determine whether ultrasound gestational age assessment is cost effective.

Keywords: ultrasound, gestational age, dating

Evidence: Published literature was retrieved through searches of PubMed or MEDLINE and The Cochrane Library in 2013 using appropriate controlled vocabulary and key words (gestational age, ultrasound biometry, ultrasound dating). Results were restricted to systematic reviews, randomized control trials/controlled clinical trials, and observational studies written in English. There were no date restrictions. Searches were updated on a regular basis and incorporated in the guideline to July 31, 2013. Grey (unpublished) literature was identified through searching the websites of health technology assessment and health technology-related agencies, clinical practice guideline collections, clinical trial registries, and national and international medical specialty societies.

Values: The quality of evidence in this document was rated using the criteria described in the Report of the Canadian Task Force on Preventive Health Care (Table 1).

Benefits, harms, and costs: Accurate assignment of gestational age may reduce post-dates labour induction and may improve obstetric care through allowing the optimal timing of necessary interventions and the avoidance of unnecessary ones. More accurate dating allows for optimal performance of prenatal screening tests for aneuploidy. A national algorithm for the assignment of gestational age may reduce practice variations across Canada for clinicians and researchers. Potential harms include the possible reassignment of dates when significant fetal pathology (such as fetal growth restriction or macrosomia) result in a discrepancy between ultrasound biometric and clinical gestational age. Such reassignment may lead to the omission of appropriate—or the performance of inappropriate—fetal interventions.

Summary Statements

1. When performed with quality and precision, ultrasound alone is more accurate than a “certain” menstrual date for determining gestational age in the first and second trimesters (≤ 23 weeks) in spontaneous conceptions, and it is the best method for estimating the delivery date. (II)
2. In the absence of better assessment of gestational age, routine ultrasound in the first or second trimester reduces inductions for post-term pregnancies. (I)

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Table 1. Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventive Health Care

Quality of evidence assessment*	Classification of recommendations†
I: Evidence obtained from at least one properly randomized controlled trial	A. There is good evidence to recommend the clinical preventive action
II-1: Evidence from well-designed controlled trials without randomization	B. There is fair evidence to recommend the clinical preventive action
II-2: Evidence from well-designed cohort (prospective or retrospective) or case–control studies, preferably from more than one centre or research group	C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making
II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category	D. There is fair evidence to recommend against the clinical preventive action
	E. There is good evidence to recommend against the clinical preventive action
III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees	L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making

*The quality of evidence reported in these guidelines has been adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.[118]

†Recommendations included in these guidelines have been adapted from the Classification of Recommendations criteria described in the Canadian Task Force on Preventive Health Care.[118]

3. Ideally, every pregnant woman should be offered a first-trimester dating ultrasound; however, if the availability of obstetrical ultrasound is limited, it is reasonable to use a second-trimester scan to assess gestational age. (I)
4. Notwithstanding Summary Statements 1, 2, and 3, women vary greatly in their awareness of their internal functions, including ovulation, and this self-knowledge can sometimes be very accurate. (III)

Recommendations

1. First-trimester crown-rump length is the best parameter for determining gestational age and should be used whenever appropriate. (I-A)
2. If there is more than one first-trimester scan with a mean sac diameter or crown-rump length measurement, the earliest ultrasound with a crown-rump length equivalent to at least 7 weeks (or 10 mm) should be used to determine the gestational age. (III-B)
3. Between the 12th and 14th weeks, crown-rump length and biparietal diameter are similar in accuracy. It is recommended that crown-rump length be used up to 84 mm, and the biparietal diameter be used for measurements > 84 mm. (II-1A)
4. Although transvaginal ultrasound may better visualize early embryonic structures than a transabdominal approach, it is not more accurate in determining gestational age. Crown-rump length measurement from either transabdominal or transvaginal ultrasound may be used to determine gestational age. (II-1C)
5. If a second- or third-trimester scan is used to determine gestational age, a combination of multiple biometric parameters (biparietal diameter, head circumference, abdominal circumference, and femur length) should be used to determine gestational age, rather than a single parameter. (II-1A)
6. When the assignment of gestational age is based on a third-trimester ultrasound, it is difficult to confirm an accurate due date. Follow-up of interval growth is suggested 2 to 3 weeks following the ultrasound. (III-C)

INTRODUCTION

The accurate dating of pregnancy is critically important for pregnancy management from the first trimester to delivery, and is particularly necessary for determining viability in premature labour and in post-dates deliveries.[1] Prior to the widespread use of ultrasound, caregivers relied on a combination of history and physical examination to clinically determine gestational age. Ultrasound gave clinicians a method to measure the fetus and therefore to estimate gestational age. Much of our current clinical practice is based on studies from the 1980s and 1990s. As new information emerges in fields, such as reproductive biology, perinatal epidemiology, and medical imaging, our current clinical practice is being challenged. "Certain" menstrual dating, for example, is less certain than previously thought.

When ultrasound is performed with quality and precision, there is evidence to suggest that dating a pregnancy using ultrasound measurements is clinically superior to using menstrual dating with or without ultrasound, and this has been advocated and adopted in other jurisdictions.[2–6]

GESTATIONAL AGE ESTIMATES USING CLINICAL DATING

The clinical estimate of gestational age typically relies on clinical history (menstrual cycle length, regularity, and recall of the first day of the last menstrual period), followed by confirmation by physical examination or other signs and symptoms.[7–9]

Dating Based on Menstrual History

Dating by certain menstrual history is inexpensive and readily available. Typically, the EDD is based on a 280-day gestation from the first day of the LMP. Certain menstrual dating criteria assume regular cycles, ovulation at the midpoint of the cycle, fertilization on the middle day of the cycle, correct recall of the onset of the LMP, and the woman having been free of oral contraceptives for several months prior. Women vary greatly in their awareness of their internal functions, including ovulation. Their self-knowledge of ovulation can sometimes be very accurate; however, the only truly certain clinical history is one in which the dates of ovulation, fertilization, and implantation are precisely known, as in ART, in which records include the date of oocyte retrieval, and other methods of timed ovulation and fertilization. Unfortunately, without timed ovulation and fertilization as in ART and other timed methods, clinical history is often not reliable.[10] Campbell et al. demonstrated that 45% of pregnant women are uncertain of menstrual dates as a result of poor recall, irregular cycles, bleeding in early pregnancy, or oral contraceptive use within 2 months of conception.[11]

Even if menstrual history is correct, the exact time of ovulation, fertilization, and implantation cannot be known. Women may undergo several "waves" of follicular development during a normal menstrual cycle, which may mean ovulatory inconsistency during any given cycle.[12,13] Sperm may survive for 5 to 7 days in the female reproductive tract, a "known" conception date is therefore not completely reliable.[14] Recent studies suggest the ovulation-to-implantation duration can vary by as much as 11 days, and this may affect fetal size and growth.[15] Even in women who are certain of menstrual dating, delayed ovulation is an important cause of perceived prolonged pregnancy and is more likely to occur than early ovulation.[16] Some authors have suggested that 282 days should be used instead of 280 to improve dating accuracy, since it is more likely that women will ovulate later rather than earlier than predicted.[9] All of these factors conspire to make it difficult to accurately predict gestational age based on menstrual history.

Dating Based on Clinical Examination

The size of the uterus, estimated through pelvic or abdominal examination, can be roughly correlated with gestational age; however, factors that affect uterine size (such as fibroids) and maternal body characteristics (such as obesity) will affect such an estimate. The uterus is approximately the size of a grapefruit at 10 to 12 weeks. At 20 weeks the fundus reaches the umbilicus. After 20 weeks the symphysis fundal height, in centimetres, should correlate with the week of gestation.[7,17] Fetal heart tones are audible at 11 to 12 weeks with electronic Doppler devices, and this audibility can also assist in the clinical assignment of gestational age.[10]

Gestational Age Estimation Based on Ultrasound Findings

Ultrasound biometric measurements determine gestational age based on the assumption that the size of the embryo or fetus is consistent with its age. Biological variation in size is less during the first trimester than in the third trimester. Ultrasound estimation of gestational age in the first trimester is therefore more accurate than later in pregnancy.[18] Full descriptions of each parameter and published ranges of accuracy are outlined in Table 2.

The determination of gestational age in the first trimester uses the mean gestational sac diameter and/or the crown–rump length. During the first 3 to 5 menstrual weeks an intrauterine pregnancy is first signaled by the presence of a gestational sac.[19] The gestational sac represents the chorionic cavity, and its echogenic rim represents the implanting chorionic villi and associated decidual tissue.[20] The smallest gestational sac size that can be clearly distinguished by high frequency transvaginal transducers is 2 to 3 mm, which corresponds to a gestational age of about 32 to 33 days.[21] The MSD is a commonly used, standardized, way to estimate gestational age during early pregnancy. It is less reliable when the MSD exceeds 14 mm or when the embryo can be identified.[22] The growth of the MSD is approximately 1 mm per day.[23] CRL has lower interobservor variability than MSD, and may thus be better for dating a pregnancy.[24]

ABBREVIATIONS

AC	abdominal circumference
ART	assisted reproductive technology
BPD	biparietal diameter
CRL	crown-rump length
EDD	estimated due date
FL	femur length
HC	head circumference
ISUOG	International Society of Ultrasound in Obstetrics and Gynecology
LMP	last menstrual period
MSD	mean sac diameter
PPV	positive predictive value
TA	transabdominal
TV	transvaginal
US	ultrasound

Yolk Sac

When the yolk sac appears in the gestational sac it provides confirmation of an intrauterine pregnancy and may be initially visible as early as the start of the 5th week or as late as the 6th week. It grows to a maximal size of 6 mm by 10 weeks and gradually migrates to the periphery of the chorionic cavity. At the end of the first trimester it becomes undetectable. Although the presence of the yolk sac is helpful in determining the presence of an intrauterine pregnancy, direct measurement of this structure is not useful in determining gestational age.[25]

Crown-Rump Length

Direct measurement of the CRL provides the most accurate estimate of gestational age once the embryo is clearly seen. Ideally, either the best CRL or the average of several satisfactory measurements should be used.[26] The CRL measurement is reported to be accurate for dating to within 3 to 8 days.[22,27–39] The MSD should not be used to estimate gestational age once the CRL can be measured.[22,39,40]

The narrowest confidence interval appears to be between 7 and 60 mm for CRL.[3,29,30,40] The slope of the embryonic growth curve is small before this time and it can be difficult to clearly identify a very early fetus; thus, it is this committee's expert opinion that reliability and measurability is best when the CRL is at least 10 mm. If more than one scan is performed in the first trimester, the earliest scan with a CRL of at least 10 mm should be used. To avoid performing extra ultrasounds, it is acceptable to time the dating scan to coincide with nuchal translucency screening (if available).

Several studies have evaluated CRL and BPD between 12 and 14 weeks, with conflicting results. The majority suggest there is no clinically important difference among confidence intervals, suggesting that either CRL or BPD should be used at this gestational age.[41–44] The 84 mm threshold for CRL for estimating gestational age, as suggested by the ISUOG, seems reasonable.[6]

Recommendations

1. First-trimester crown-rump length is the best parameter for determining gestational age and should be used whenever appropriate. (I-A)
2. If there is more than one first-trimester scan with a mean sac diameter or crown-rump length measurement, the earliest ultrasound with a crown-rump length equivalent to at least 7 weeks (or 10 mm) should be used to determine the gestational age. (III-B)
3. Between the 12th and 14th weeks, crown-rump length and biparietal diameter are similar in accuracy. It is recommended that crown-rump length be used up to 84 mm, and the biparietal diameter be used for measurements > 84 mm. (II-1A)

Transabdominal Versus Transvaginal Ultrasonography

Transvaginal ultrasound is typically used to evaluate early first trimester pregnancy structures, such as the gestational sac, yolk sac, and embryo. Original studies comparing transabdominal and transvaginal techniques in early pregnancy demonstrated that TV was the superior method.[45–47] Perhaps because of better technology, more recent studies have not found the same result. Grisolia et al. concluded that the accuracy of TV ultrasound has not been shown to be superior to TA ultrasound in dating pregnancies.[31] Other authors have found that TA is comparable to TV in determining gestational age if CRL is measurable after 6 weeks.[31,48–50]

Recommendation

4. Although transvaginal ultrasound may better visualize early embryonic structures than a transabdominal approach, it is not more accurate in determining gestational age. Crown-rump length measurement from either transabdominal or transvaginal ultrasound may be used to determine gestational age. (II-1C)

Crown-Rump Length in Pregnancies Conceived by Assisted Reproductive Technology

When the conception date is known absolutely, as with timed ovulation/fertilization during ART, the EDD should be calculated based on the fertilization date. Studies have demonstrated that the CRL measurements in IVF pregnancies are those to be expected in naturally conceived pregnancies, suggesting that study results can be extrapolated between the 2 populations.[30,51,52]

Second and Third Trimester

In the second and third trimesters, estimation of gestational age is accomplished by measuring the biparietal diameter, head circumference, abdominal circumference, and femur length. These measurements are only as good as the quality of the images. Optimal imaging can be difficult in some clinical situations, such as in a late pregnancy abnormal lie when the head is deep in the maternal pelvis, maternal obesity, or multiple gestation. Normal biological variation appears to have more influence on measurements in the second and third trimester. Thus, in the second half of pregnancy these measurements are less reliable than first trimester CRL, and they become increasingly inaccurate as gestation progresses

Table 2. Common definitions of ultrasound biometry parameters and estimates of accuracy for predicting gestational age

Parameter	Description	Notes	Approximate accuracy of dates	References
Mean sac diameter	The mean of 3 orthogonal sac "inner to inner" diameter measurements (mm). Cursers should be placed on the gestational sac and not the surrounding echogenic region.	Should not be averaged with the CRL. Should not be used once CRL can be measured. GA = 30 days plus MSD measured in mm.	4 to 11 days	Grisolia (2003)[31] Daya (1993)[30]
Crown-rump length	The crown-rump length is the longest straight line length of the embryo from the outer margin of the cephalic end to the rump. The neck position should be neutral.	The best CRL or the average of several satisfactory measurements should be used.	3 to 8 days	Grisolia (2003)[31] Daya (1993)[30] Sladevickus (2004)[42]
Biparietal diameter	Axial plane through a symmetrical calvarium that includes the third ventricle, thalami, falx cerebrum, and cavum septi pellicidi anteriorly and the tentorial hiatus posteriorly. The calipers should be placed at the maximal diameter from the outer edge of the proximal skull wall to the inner edge of the distal skull.		1st T: 3 to 8 days 2nd T: 7 to 12 days	Grisolia (2003)[31] Daya (1993)[30] Sladevickus (2004)[42] Bovicelli (1981)[28] Hadlock (1984)[72] Hadlock (1987)[73] Hadlock (1991)[54] Chervenak (1998)[61]
Head circumference	The head circumference is obtained in the identical plane to the BPD. The trace/ellipse should follow the outer perimeter of the bony skull, not the overlying skin, as that will falsely increase the head circumference	The cerebellum is not included in this image.	2nd T: 7 to 12 days	Hadlock (1984)[72] Hadlock (1987)[73] Hadlock (1991)[54] Chervenak (1998)[61]
Abdominal circumference	True axial plane at the level of the bifurcation of the portal vein (into right and left branches) and the stomach. The measurement should be as tight to skin as possible.		2nd T: 7 to 15 days 3rd T: 18 to 35 days	Hadlock (1984)[72] Hadlock (1987)[73] Hadlock (1991)[54] Chervenak (1998)[61]
Femur length	Both the femoral head or greater trochanter and the femoral condyle are simultaneously visualized. The cursor should be placed at the junction of bone and cartilage and only the bone measured	Ideally, the ultrasound transducer should be aligned perpendicular to the long axis of the femur. Varies with ethnicity.	2nd T: 7 to 17 days 3rd T: 21 days	Hadlock (1984)[72] Hadlock (1987)[73] Hadlock (1991)[54] Chervenak (1998)[61]

T: trimester

(Table 2).[18,53] Maternal and fetal pathology may affect them, so their inclusion or exclusion in the determination of gestational age requires clinical judgement.

The BPD is less reliable in determining gestational age when there are variations in skull shape, such as dolichocephaly or brachycephaly; hence some authors feel that BPD is less reliable than HC.[9,53–57] As a single parameter, HC correlates better to gestational age than the other 3 standard parameters in the second trimester, and as with all others, it becomes less accurate with increasing gestational age.[58–61]

It is more challenging to measure the fetal AC than the other parameters. The abdomen has no bright echoes of bone, it is not always symmetrical, and its size will vary with fetal respiration and central body flexion/extension. Of all the fetal biometric parameters, this measurement has the most variability as it is somewhat dependant on fetal growth factors and body position.[54,61–63]

Femur length varies somewhat with ethnicity. Short femurs are commonly a normal variant, however this finding may also indicate fetal growth restriction, aneuploidy, and—when severely shortened—skeletal dysplasias.[53,64–69]

Composite Versus Single Biometry Measurement

Using multiple parameters is superior to using a single second trimester parameter.[63,70,71] As more parameters are used, accuracy improves; however, there is no significant benefit beyond 3 commonly used parameters.[3,61,70–73]

Multiple parameters are also useful if any one parameter is affected by a fetal condition/syndrome, such as achondroplasia on femur length. It is prudent to evaluate the etiology of an aberrant measurement to determine its clinical significance.

Commonly, clinicians use the unweighted mean of all 4 biometric parameters (BPD, HC, AC, and FL). However, it is clear that all 4 are not equally correlative, thus many authors have created regression equations using various combinations of biometric parameters to improve accuracy.[54,61,74,75] It is not clear which method is superior in determining gestational age.[61,72] Until more research is available, it is reasonable to use either when estimating second or third trimester gestational age. Up to 23 weeks, second trimester US has a 95% CI of less than a week for predicting gestational age, comparable to first trimester US.[61] In the late second trimester, clinical judgement should be exercised.

Since the confidence intervals in the third trimester are quite large (2 to 2.4 weeks), it is not clear that US determined gestational age is superior to clinical history and the application of judicious clinical judgement may be warranted. There is also a concern that when gestational age assessment is based on a third trimester scan only, the fetus may in fact be growth restricted,[61] and gestational age therefore underestimated. Hence, a follow-up scan for growth in such circumstances should be considered to evaluate interval growth.

Recommendations

5. If a second- or third-trimester scan is used to determine gestational age, a combination of multiple biometric parameters (biparietal diameter, head circumference, abdominal circumference, and femur length) should be used to determine gestational age, rather than a single parameter. (II-1A)
6. When the assignment of gestational age is based on a third-trimester ultrasound, it is difficult to confirm an accurate due date. Follow-up of interval growth is suggested 2 to 3 weeks following the ultrasound. (III-C)

Other Biometry

Measurement of the transcerebellar diameter, foot length, clavicle length, intra/interorbital diameters, kidney length, sacral length, scapula length, as well as the length of other long bones of the extremity have also been evaluated to determine gestational age. Studies have not shown that these parameters improve the assessment of gestational age beyond that achieved with standard biometry, however they may be useful in clinical situations in which traditional biometry is difficult to attain (such as uteroplacental insufficiency) or when fetal abnormalities are present.[76–86]

Signs of Fetal Maturity

Identification of certain US findings suggest that a fetus has reached the third trimester and may correlate with fetal lung maturity and gestational age. These parameters are the epiphyseal ossification centres of the distal femur, proximal tibia, and proximal humerus. The measurement of these ossification centres does not precisely correlate with gestational age; however, their presence may be helpful late in pregnancy when the gestational age is not known. The presence of distal femoral epiphysis has a PPV of 96% for indicating a pregnancy of at least 32 weeks, the proximal tibial epiphysis has a PPV of 83% for indicating a pregnancy of at least 37 weeks, and the proximal humeral epiphysis has a PPV of 100% for indicating a pregnancy of at least 38 weeks.[87–91]

WHAT IS THE BEST METHOD FOR ASSIGNING GESTATIONAL AGE?

Currently, most centres in Canada use a combined approach in which US is used to confirm reliable

menstrual dating. If there is an unreliable menstrual history, the US prediction of EDD is used. Clinical judgement is used to resolve conflicting data. However, centres vary in terms of confidence intervals and biometry charts used.

Many studies evaluating menstrual dating, compared with US dating, in the first and second trimesters have found US dating superior for predicting the actual date of delivery.[92–98] No study has shown that it is inferior to menstrual dating. Menstrual dating underestimates the US-based EDD by an average of 2 to 3 days.[95] Ultrasound dating alone was significantly better in predicting the actual date of delivery than any of the dating policies using menstrual dates alone or in combination with US.[9,99]

Many studies document that the use of US dates reduces the rate of post-dates pregnancy by about 70% even in the face of certain menstrual history.[92,96,97,99,100] The most recent Cochrane systematic review found reduced rates of induction for post-term pregnancy (OR 0.59; 95% CI 0.42 to 0.83) among women who underwent routine US in early pregnancy (< 24 weeks) and concluded that early pregnancy US enables better gestational age assessment, as well as conferring other benefits.[101]

Using US-based gestational age assignment would also result in improved performance of prenatal screening programs. Using US estimates exclusively would increase sensitivity for Down syndrome anywhere from 9% to 16%, and/or decrease false-positive rates (for a set sensitivity) by 2.6%.[102,103] There might be a very slight increase in the screening positive rate for open neural tube defects, but this is more than offset by the decrease in false-positive rates for Down syndrome. The common practice of using certain menstrual dates confirmed by US is inferior to using US alone.[104] In the context of serum screening, first and early second-trimester US parameters perform similarly.[100,102,104–106]

Some clinicians fear that the exclusive use of US-based estimates of gestational age would result in pregnancy complications because of the potential to miss early growth discordance. A large-for-gestational-age fetus might be mistakenly assigned a greater gestational age because of its larger size or an early growth-restricted fetus may be incorrectly assigned a later due date. This may potentially mask an underlying fetal or placental problem leading to pregnancy complications, such as preterm birth, preeclampsia, and fetuses small for gestational age, or it may cause a delay in the recognition of fetal abnormalities. There is disagreement in the literature as to whether a significant discordance between menstrual and US estimates of gestational age is associated with an increased risk of obstetrical complications.[107–114] Interestingly, an unreliable menstrual history itself confers an increased risk of adverse pregnancy outcomes.[112] Although there may be a risk in using US dating exclusively, some of this risk would remain whenever there is discordance between menstrual and US estimates, regardless of which method of gestational age assignment is used. Furthermore, the clinical management of such situations is unclear. More research is needed in this area.

Summary Statements

1. When performed with quality and precision, ultrasound alone is more accurate than a "certain" menstrual date for determining gestational age in the first and second trimesters (≤ 23 weeks) in spontaneous conceptions, and it is the best method for estimating the delivery date. (II)
2. In the absence of better assessment of gestational age, routine ultrasound in the first or second trimester reduces inductions for post-term pregnancies. (I)

SHOULD ROUTINE FIRST TRIMESTER DATING ULTRASOUNDS BE OFFERED TO ALL PREGNANT WOMEN?

A routine first trimester US has many advantages: early identification of gross anomalies and multiple gestations, more precise dating, improved performance of prenatal screening, and an opportunity to perform nuchal translucency as part of prenatal genetic screening. In many jurisdictions, a dating US is performed routinely in all women, regardless of menstrual history. The availability, quality, and health care cost of obstetrical US is a significant factor in local patterns of practice.[2] Crowther et al. found routine early US (< 17 weeks) provided more precise estimates of gestational age than later US (18 to 22 weeks), reduced the need to adjust the EDD in mid-gestation, and decreased maternal anxiety.[115]

The balance of the literature supports using first trimester US to reduce the incidence of induction for post-dates pregnancy.[18,99,100,116–118] Although no comprehensive cost benefit analysis has been done on routine early US for dating, the current literature suggests significant benefits are present. Ideally, where it is readily available, a first trimester US for dating should be performed. Where nuchal translucency is available, this scan can serve both functions. When a first trimester US cannot be obtained, the available evidence suggests the second trimester US can be used for similar benefits.[101]

Summary Statements

3. Ideally, every pregnant woman should be offered a first trimester dating ultrasound; however, if the availability of obstetrical ultrasound is limited, it is reasonable to use a second trimester scan to assess gestational age. (I)
4. Notwithstanding Summary Statements 1, 2, and 3, women vary greatly in their awareness of their internal functions, including ovulation, and this self-knowledge can sometimes be very accurate. (III)

SUMMARY

The accurate determination of gestational age is required for many aspects of antenatal care. In the past, it was probably felt that a few days of inaccuracy was acceptable; however, emerging data suggests that a few days inaccuracy can affect things, such as the performance of maternal serum screening, the assessment of post-dates pregnancy, and the subsequent induction of labour. Based on the available research, the use of US-derived dates is the best method to determine gestational age for clinical use. It is not, however, intended to be used to determine the exact date of conception because of biological variability in reproduction, fetal size, and development. Clinical history may have value in determining gestational age, and on rare occasions may supersede US dating; however, in order to achieve the most clinical benefit, the use of US dating should predominate.

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