
OBSTETRICS

A Preliminary Report on Mid-trimester Routine Ultrasonographic Screening in Ramathibodi Hospital

Thavat Jetsawangsi MD,
Nopadol Saropala MB, BS, MRCOG,
Apichart Chittachareon MD,
Rasig Rangsiprakarn MD,
Yongyoth Herabutya MB, BS, MRCOG.

Department of Obstetrics and Gynaecology, Faculty of Medicine, Ramathibodi Hospital, Bangkok, 10400, Thailand

ABSTRACT

- Objective** To evaluate the detection rate and type of abnormal findings by mid-trimester routine ultrasonographic screening.
- Design** Prospective descriptive study.
- Setting** Department of Obstetrics and Gynaecology, Faculty of Medicine, Ramathibodi Hospital.
- Subjects** All primigravida of less than 30 years old who attended the antenatal care clinic at Ramathibodi Hospital in 1994.
- Main outcome measures** Number and percentage of abnormal findings detected by routine ultrasonographic screening.
- Results** Twelve percent of all women screened had abnormal findings. This included 3 malformations (0.2%), 3 ectopic pregnancies (0.2%), 5 pregnancies with ovarian tumour (0.34%), 5 pregnancies with myoma uteri (0.34%), 7 molar pregnancies (0.47%), 12 twin pregnancies (0.81%), 23 placenta previa (1.54%), 73 abortions (4.95%) and 57 cases who did not pregnant (3.83%).
- Conclusion** Mid-trimester routine ultrasonographic screening in pregnant women seems to be of benefit and cost effective in Ramathibodi hospital.

Key words : mid-trimester, ultrasound

The subject of routine ultrasonographic screening at mid-trimester during pregnancy remains controversial. Its usefulness includes

accurate dating of gestational age, early detection of multifetal pregnancy, detection of potential cases of placenta previa, detection of fetal mal-

formation and detection of abnormal pregnancies such as hydatidiform mole and dead fetus in utero. Accurate dating of gestational age also makes subsequent diagnosis of intrauterine growth retardation easier. These seemingly obvious advantages had led to wide spread implementation of screening programme across the continents. Historically the first large scale screening programme was introduced twenty years ago in Sweden where a two-stage examination is offered to the pregnant population ; the first is at 19 weeks and the second at 32 weeks.⁽¹⁾ This was adopted by the Federal Republic of Germany in 1980 and by Austria in 1988. In 1986 Norway and Iceland on the other hand recommended the one-stage mid-trimester screening programme to their populations.

The increasing implementation of routine ultrasonographic screening programme into many obstetric units worldwide had led to the evaluation of its usefulness and cost effectiveness. Many authors doubt its ability to reduce perinatal mortality and improve pregnancy outcome.⁽²⁻⁵⁾ In 1984 two contradicting reports were published.

One, in Great Britain a working party of the Royal College of Obstetricians and Gynaecologists favoured an one-stage ultrasonographic screening.⁽⁶⁾ The other, from the United States a panel from the National Institute of Health concluded that routine ultrasonographic screening was not recommended.⁽⁷⁾

The Department of Obstetrics and Gynaecology at Ramathibodi hospital is responsible for nearly 8,000 births annually. Towards the end of 1993 we contemplated on offering an one-stage ultrasonographic screening to our pregnant population. Being aware of the controversy surrounding the usefulness and cost effectiveness of the screening programme, not to mention the possible adverse effects on the fetus^(8,9) which to date is only theoretical, we decided to carry out a pilot study, performing routine one-stage examination on a low risk group. The objective of this study was to evaluate the detection rate and types of abnormal findings. The results of this study could also help us in working out the feasibility of implementing screening programme for the whole pregnant population.

Table 1. Results of mid-trimester routine ultrasonographic screening

Results	Number	%
Normal single viable fetus	1,281	86.03
Abortion	73	4.95
Not pregnant	57	3.83
Placenta previa	23	1.54
Twin pregnancy	12	0.81
Molar pregnancy	7	0.47
Pregnancy with myoma uteri	5	0.34
Pregnancy with ovarian tumour	5	0.34
Ectopic pregnancy	3	0.20
Fetal anomalies	3	0.20

Materials and Methods

The study period was from January to December 1994. Our antenatal clinic runs on Monday, Wednesday and Friday from 8 : 00 - 12 : 00 a.m. Prior to the study we were already providing ultrasonographic services to 15 - 20 women per day with indications. The study group included all primigravida of less than 30 years old. A level one ultrasonographic scanning was performed at 18 - 22 weeks by Obstetricians using a Hitachi EUB-415 scanner. Measurements taken included biparietal diameter, femur length and abdominal circumference. The placenta site and amount of amniotic fluid were noted and fetal malformation searched for. In cases of uncertain abnormal findings the women were reviewed by a panel of Obstetricians with repeated scans on Thursday afternoon when more time is available. The diagnosis and management thereof is then decided in consultation with senior Obstetricians.

Results

During the studied period 1,489 women were screened at 18-22 weeks' gestation. This represents an average of 10 women per clinic. As we also performed approximately 20 indicated scans each morning, the time spent on each woman was 5 - 10 minutes. Results of the ultrasonographic screening are shown in table 1.

Twelve percent (N = 188) of all women screened had abnormal findings. These included 57 women who were in fact not pregnant. There were three anencephaly (0.2%), all of which were terminated subsequently. There was no malformation which was missed by routine ultrasonographic screening. Of all the 23 women who were found to have placenta covering the cervical os at routine ultrasonographic screening were subsequently shown to have placenta previa at term.

Discussion

In developed countries the three leading contributing factors to perinatal mortality are congenital malformation, prematurity and intrauterine growth retardation. Our department for many years now has had low perinatal mortality rate of 6 - 8/1,000 livebirths,⁽¹⁰⁾ a figure comparable to that of developed countries. We are no longer presented with problems of neonatal sepsis, intrapartum asphyxia or traumatic delivery. To further improve our maternal-perinatal care it was agreed that routine ultrasonographic screening might be of benefit.

Our pilot study shows that even in a low risk group, appreciable number of abnormal findings were detected. In these cases routine ultrasonographic screening at mid-trimester removed the doubt of uncertaining of gestation. The incidence of fetal malformations is 0.2%. This is fewer than the usual 0.5-1% quoted and could be explained by our selected low risk study group. Despite the fact that our study group only accounts for 20% of the total number of deliveries in 1994, the number of anomalies which were represented in perinatal mortality rate decreases to 8 as compare to 16 in 1991 and 12 in 1993. We therefore expect this number to decrease further if the whole pregnant population was screened. It is surprising to find that 4 percent of all patients were not pregnant. This reflects the inefficiency of the booking system. In our unit most patients usually booked very early in pregnancy (less than 12 weeks). Bimanual pelvic examination is not routinely performed at the first visit and since the second visit is at about 20 weeks when routine ultrasonographic examination is carried out, many patients who were never pregnant would only be detected at this ultrasound examination.

As mentioned earlier published works which

do not recommend routine ultrasonographic screening programme based their conclusions on their findings that routine ultrasonographic screening failed to reduce perinatal mortality and improve pregnancy outcome and therefore not cost-effective. There are several reasons for such findings. Many of the malformations were detected after 24 weeks when legal termination of pregnancy is not available.⁽²⁾ Many of the women who were carrying abnormal fetuses chose to continue their pregnancies.⁽²⁾ Some of the anomalies detected are amenable to medical and surgical treatment.⁽⁵⁾ We believe the situation in our population is different. From our experience throughout the years all the parents who were informed that the fetus they were carrying had major malformations chose to terminate the pregnancies. Many of the malformations which may be successfully treated in developed countries are usually fatal here in our country.

As in any screening programme the most important issue which we have not addressed here is the cost effectiveness. The most recent study which attempts to tackle this is from South Africa.⁽¹¹⁾ This is the first randomized controlled trial in a developing country. The authors conclude that routine ultrasonographic screening is expensive and more selective use of ultrasound is not accompanied by increased adverse perinatal outcome.

Among the various parameter used in assessing the cost effectiveness the most difficult if not an impossible factor to evaluate is the psychological trauma inflicted on the parents on learning that they are carrying abnormal pregnancies. The choice lies between the tremendous grief of an unexpected birth of a severely malformed baby at term in unscreened women and the psychological trauma of going through mid-trimester termination of pregnancy

after a malformation is discovered during routine ultrasonographic screening.

The results of other studies which have shown that routine ultrasonographic screening can detect fetal malformations and reduce perinatal mortality and morbidity,⁽¹²⁻¹⁴⁾ together with the preliminary result of this pilot study have encouraged us to decide to implement routine ultrasonographic screening programme to the whole pregnant population. Only when this has been carry out for sometime then we would be able to fully assess the impact on whether we could improve pregnancy outcome and reduce our perinatal mortality rate still further.

References

1. Grennert L, Persson PH, Gennser G. Benefits of ultrasonic screening of a pregnant population. *Acta Obstet Gynecol Scand* 1978 ; 78(suppl) : 5.
2. Ewigman BG, Crane JP, Frigoletto FD, LeFevre ML, Bain RP, McNellis D. Effect of prenatal ultrasound screening on perinatal outcome. *N Engl J Med* 1993 ; 329 : 821-7.
3. Thacker SB. Quality of controlled clinical trials. The case of imaging ultrasound in obstetrics : a review. *Br J Obstet Gynaecol* 1985 ; 92 : 437-44.
4. Bucher HC, Schmidt JG. Does routine ultrasound scanning improve outcome in pregnancy ? Meta-analysis of various outcome measures. *Br Med J* 1993 ; 307 : 13-7.
5. Crane JP, LeFevre ML, Winborn RC, Evans JK, Ewigman BG, Bain RP, et al. A randomized trial of prenatal ultrasonographic screening : Impact of the detection, management and outcome of anomalous fetuses. *Am J Obstet Gynecol* 1994 ; 171 : 392-9.
6. Royal College of Obstetricians and Gynaecologists Working Party on Routine Ultrasound Examination in Pregnancy. London : Royal College of Obstetricians and Gynaecologists, 1984.
7. National Institutes of Health consensus development conference. Diagnostic ultrasound in pregnancy : consensus statement, Washington, DC : US Government Printing Office, 1984.
8. Newham JP, Evans SF, Michael CA, Stanley FJ,

- Landau LI. Effects of frequent ultrasound during pregnancy : a randomised controlled trial. *Lancet* 1993 ; 342 : 887-91.
9. Salvesen KA, Vatten LJ, Eik-Nes SH, Haugdahl K, Bakketeig LS. Routine ultrasonography in utero and subsequent handedness and neurological development. *Br Med J* 1993 ; 307 : 159-64.
10. Annual report. Department of Obstetrics and Gynecology. Ramathibodi Hospital. 1991-1994.
11. Geerts LT, Brand EJ, Theron GB. Routine obstetric ultrasound examinations in South Africa : cost and effect on perinatal outcome-a prospective randomised controlled trial. *Br J Obstet Gynaecol* 1996 ; 103 : 501-7.
12. Chitty LS, Hunt GH, Moore J, Lobb MO. Effectiveness of routine ultrasonography in detecting fetal structural abnormalities in a low risk population. *Br Med J* 1991 ; 303 : 1165-9.
13. Saari-Kemppainen A, Karjalainen O, Ylostalo P, Heinonen OP. Ultrasound screening and perinatal mortality : controlled trial of systematic one-stage screening in pregnancy. *Lancet* 1990 ; 336 : 387-91.
14. Luck CA. Value of routine ultrasound scanning at 19 weeks : a four year study of 8849 deliveries. *Br Med J* 1992 ; 304 : 1474-8.