ROLE OF OBSTETRIC ULTRA SOUND IN ROUTINE SCREENING AFTER 14 WEEKS FOR DETECTION OF CONGENITAL ANOMALIES

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SUMMARY

Prenatal ultrasonography has been developed as a powerful tool for Routine Screening after 14 weeks of gestation, for the detection and delineation of congenital malformations. At the "Institute of Obstetrics and Gynaecology, Egmore, Madras - 600 008, we performed routine ultrasonic screening after 14 weeks in 1500 cases during August to October 1992. We diagnosed 17 cases of Major anomalies. The Anomalies were Anencephaly-8, Hydrocephaly-2, Encephalocele-1, Meningo myelocele-1, Monster-1, Bilateral Hydronephrosis-2, Univentricular heart-1, Achondroplasia-1. In 13 cases, pregnancies were terminated by intra-uterine bougie application and 4 were allowed to continue pregnancy with information to parents about the anomalies of foetuses, and with advice on necessary measurements post-natally. So, prenatal routine ultrasonic screening after 14 weeks reduces human mortality and morbidity and allows the parents to be prepared to face a physically handicapped child.

INTRODUCTION

Congenital anomalies are the frequent causes of maternal mortality and morbidity and birth of a physically handicapped child. Major anomalies are present in 2-5% of New born and account for 20-30% perinatal deaths. Birth of a child with a major anomaly commonly leads to economic burden, domestic difficulties, feeling of guilt, alteration of life style and avoidance of future pregnancies. For all these reasons, detection of congenital anomalies and necessary measurement for

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those, are considered as important goals in medicine.

There are limitations of prenatal ultrasonic detection of congenital anomalies, but that is negligible in comparison to benefits of that.

Our following study highlights on the benefits of prenatal detection of congenital anomalies by routine ultrasonic screening after 14 weeks of gestation.

MATERIAL, METHODS AND RESULTS

Screening was done with the help of Real-Time Ultrasound Scanner TOSHIBA - Sonolayer - SAL - 388 and 3.5 MHz Convex Sector probe.

Our study included detection of congenital anomalies by routine ultrasonic screening of 1500 cases from August to October of 1992, at the "Institute of Obstetrics and Gynaecology, Egmore, Madras". of which we detected 17 cases of Major anomalies (1.13%). Some were detected by screening on high risk factors and clinically suspicious and some were detected during screening for foetal biometry and well-being. The major anomalies included.

1. Central Nervous system - 13 cases (76.5%), of which Anencephaly - 8 cases (61.5%), Hydrocephaly - 2 cases (15.4%), Encephalocele - 1 case (7.7%), Meningo myelocele - 1 case (7.7%) and Monster- 1 case (7.7%).

2. Cardio Vascular system (Univentricular heart) - 1 case (5.9%)

3. Urinary system (Bilateral Hydronephrosis) - 2 cases (11.8%)

4. Skeletal system (Achondroplasia - 1 case (5.9%)

Of all the anomalies, anencephally, Encephalocele and monster were detected by ultrasonic screening with clini-

Table I

Total Screening - 1500 cases (After 14 weeks Gestation)

Total number of cases of detected major anomalies	Type of Major Anomalies		Number of different anomalies
17	(A)	Central Nervous System	13
		(a) Anencephaly	8
		(b) Hydrocephaly	2
		(c) Encephalocele	1
		(d) Meningo Myelocele	1
		(e) Monster	1
	(B)	Cardio Vascular System	
		Univentricular Heart	1
	(C)	Urinary System	
		Bilateral Hydronephrosis	2
	(D)	Skeletal System	
		Achondroplasia	1

cal suspicion and high risk factors of gross hydramnios and twin. Others were detected during routine ultrasonic screening for foetal bio-metry foetal well-being. Most were detected at mid trimester and some were detected in late pregnancies. 13 cases were terminated at midtrimester, by intra uterine bougie application, as 11 cases (Anencephaly Encephalocele, Hydrocephaly) were lethal themselves; 1 case (Meningomyelocele), though, not lethal itself, but due to severe physical and mental handicap after birth; 1 case (Univentricular heart) due to severe morbidity which was non-compatible for life. 4 cases were allowed the pregnancies to term with information to parents about the anomalies of foetuses, so that they were mentally prepared to face the birth of physically handicapped child for which they have to consult necessary specialists or surgeons postnatally.

DISCUSSION

Congenital anomalies have become an increasingly common cause of human mortality and morbidity, parallel with improvements in medical and obstetrical care of other disorders.

Obstetric sonography is increasingly utilised in the evaluation of a wide variety of both routine and specific obstetric indications. It is clear that detection of

Table II

Data of Anomalies with or without high risk factors, their gestational ages and necessary Measurements taken

Clinical Presentation	Major Congenital anomalies	Gestational Ages (in wks)	Measures taken T- pregnancy Termination by Intrauterine-bougie application C- Continuation of pregnancy till term
a) For High Risk Factors :			
1. Gross Hydramnios	1. Anencephaly (8)	18.20 wks (4) 22-24 wks (3) 27 - wks (1)	All - 'T' -
2. Gross Hydramnios	2. Encephalocele (1)	24 wks	'T'
3. Twin with Hydramnios	3. Monster (1) Twin B	20-21 wks	'C'
b) For foetal Bio-Metry & well-being	4. Severe Hydro-Cephaly (2)	22 & 28 wks	'T'
(Without high risk factors)	5. Menigomyelocele (1)	28 wks	'T'
	6. Univentricular heart (1)	26 wks	'T'
	7. Bilat Hydronephrosis (2)	36 & 39 wks	'C'
	8. Achondroplasia (1)	37 wks	'C'

major congenital anomalies is an increasingly important role of obstetric sonography and that all obstetric sonographers share some responsibility for detection of major congenital anomalities. Screening should be after 14 weeks, because before 14 weeks, anatomical structures of foetuses are too small for systemic evaluation by ultra-sound. Major organogenesis of foetus is completed after 14 weeks. (Barkin etal 1987) (Campbell and Pearce 1983)

A systemic approach using standardized imaging planes is necessary for improved detection of major anomalies. To get the maximum benefit, the physician who performs or supervises routine obstetric sonograms, need not be highly expertised in the prenatal diagnosis of congenital anomalies, rather need only to be thoroughly familiar with normal foetal anatomy detected in sonograms and to be able to recognise the deviations from normal and should be aware of risk factors (Vanderbergh et al 1984.) Routine screening one can detect many anomalies and if there is any suspicion in diagnosis, one can refer to centre where more sophisticated equipment and expertise are available who can do target screening.

The ultimate impact of prenatal diagnosis by sonogram must be judged by its influence on patient management. Most importantly detection of a malformation before the time of foetal viability permits the prospective parents to choose whether or not to continue pregnancy. Even if the pregnancy is continued or if the malformation is not diagnosed until after the time of foetal viability, a diagnosis of a major foetal malformation will often influence obstetric decisions regarding the place, time and mode of delivery. The parents, obstetrician, paediatrician, nursing staff and paediatric surgeon can all be prepared for the birth of an anomalous infant, thereby providing the optimal management of such infants. Certain malformations require surgical correction soon after the birth. These include neural tube defects, diaphragmatic hernia, abnormal wall defects, intestinal hernias.

Certain limitations of prenatal sonographic diagnosis of congenital anomalies are also present besides the benefits. Hill et al 1979 Manchester et al 1988. some of these are within the control of ultra-sonographer, but many are not. These limitations may be secondary to various factors. The factors are (a) Operator-dependence of ultra-sound (b) Technical limitations and Artifacts (c) Limitations due to embryologic development and physiology (d) Limitations due to non-specificity of sonographic findings. (e) Though prenatal ultrasound is remarkably accurate for detection of many major anomalies, it is insensitive for detection of many minor anomalies also, present at birth.

Other alternative way to detect anomalies can be chorion villous biopsy, which is an invasive procedure, within its own risk of abortion and infection. It cannot be used as a routine procedure, as it is time-consuming. Ultrasound has no such problems. It is safe, comparatively cheaper, convenient and immediate detective procedure also. So it is most preferable to use ultrasound for Routine screening.

CONCLUSION

Understanding from our studies, we can emphasize on benefits of prenatal ultrasonic routine screening after 14 weeks to detect congenital anomalies. This not only reduces the post-natal mortality, morbidity, but also reduces the economic burden to society, imposed by infants with congenital anomalies.

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