ANTENATAL FOETAL MONITORING;
RECENT TRENDS

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ABSTRACT
This is one year study in which we selected 290 high risk pregnancies from antenatal clinic, which comprises 19.8% of total patients who came to our clinic. Amongst these commonest age group was 21 -30 years comprising of 255 (77.5%) patients. Most of these patients were between 33-36 weeks of gestation i.e. 210 (72.4%). Commonly presented patients had bad obstetrical history 110 (37.9%), reduced foetal movements 80 (27.5%) anaemia 60(20.8%) and previous caesarean section 60 (20.8%). Diabetes mellitus 45 (15.5%) and pregnancy induced hypertension 40 (13.8%). Methods used for foetal monitoring were symphysis fundal height chart, kick count chart, ultrasonography, cardiotocography and biophysical profile and Doppler blood flow studies. The foetal loss in this group of 290 was only 3 (1.04%).

INTRODUCTION
Interest in the foetus during the antepartum period is of comparatively recent origin. In the early years of this century efforts were mainly directed towards reducing maternal mortality. The increased emphasis on careful fetal assessment during the antenatal period has evolved over the past few decades for a number of reasons. Most importantly, at least in developed countries, the risk of child bearing have become negligible due to improved general health of population, lower parity and also as a result of better obstetrical practice and childbirth facilities. These factors have permitted more time and effort to be concentrated on the foetus. In antenatal care today, the obstetrician has an increasing obligation not only to check for complicating factors influencing maternal health but also the birth of the infant in optimum condition. As a result of recent advances it is now possible not only to identify more reliably the foetus at risk but also to monitor such foetus in utero thus enabling us to intervene on firmer evidence and in time.

The corner stone of obstetrics remains the clinical examination but for the past two decades great expansion have been seen in the use of biochemical and biophysical methods for monitoring fetal well being[12].

Babies who die of asphyxia during pregnancy are usually malnourished or those who become the victims of incidental occurrence such as abruption and cord accidents. The foetus which dies of under nutrition during pregnancy is the subject of this discussion.

As a result of new information regarding the physiology of the foetus, it s now possible to recognize a foetus in jeopardy. Nevertheless Dewhurst has emphasized that it has become more and more difficult to single out the foetus at risk because of the substantial fall in perinatal mortality which has occurred over the past two decades[3]. In

an effort to minimize the chances of important factors being overlooked, check lists have been developed.

One of these check lists originated in Edinburgh[4]. Here each patient is assessed by noting the features of the pregnancy against a checklist of risk factors and appraising their significance. A pre-planned programme of management automatically follows the identification of risk factors. Another approach is to provide a scoring system, where pregnancy risk may be quantified. One of the simplest systems of antenatal assessment of fetal risks was put forward[5]. The value of this method has been proved in a prospective study by Yeh et al[6].

PURPOSE OF STUDY
To assess the value of antenatal fetal monitoring in reducing perinatal mortality in high risk pregnancies.

MATERIAL & METHODS
A study of recent trends in antenatal fetal monitoring was conducted in 290 patients of high risk pregnancy which were selected from out patient department of obstetrics and gynaecology, Unit I Nishtar Hospital Multan during the period extending from January 2001 to December 2001. In this study we admitted all the high risk pregnancies in our ward. A proforma of each patient was completed regarding her age, parity, gestational age and risk factors. The selection of foetus at risk is very important and we did this selection by using conventional methods as well as latest methods. In conventional methods we used symphysis fundal height chart, kick count chart and daily foetal sound monitoring with stethoscope. Amongst the recent trends we used Doppler's foetal heart detector (sonic aid), ultrasonography, cardiotocography and biophysical profile.

RESULTS
We have seen 1457 patients in our antenatal clinic. Out of which 290 (19.8%) were high risks pregnancies which were admitted to the ward and foetal monitoring was done.

Maximum patients in which foetal monitoring was done were in the age group of 21 -30 years i.e. 225(77.5%).

The youngest lady was 15 years old while eldest was 42 years old.

Table -I Percentage of high risk pregnancies		
Patients seen	**No fo cases**	**%age**
Total number of patients	1457	100
No of high risk pregnancies	290	19.8

Table-II Age wise distribution		
age	**No of cases**	**%age**
Less than 20 years	25	8.6
21.30 years	295	77.5
31-41 years	38	13.1
More than 40 years	2	0.7

Table -III Parity wise distribution		
Party	**No of cases**	**% age**
Primigravida	55	18.9
Gravida 2-3	100	34.5
Gravida 4-5	50	17.3
Gravida more than 5	85	29.3

This table shows that gravida 2 & 3 were more in high risk group i.e. 100 (34.5%) out of 290. The second most common group was gravida more than 5 i.e. 85 (29.3%)

Table-IV. Gestational age wise distribution		
Gestational age	No of cases	%age
28.32 weeks	55	18.9
33-36 weeks	210	72.4
More than 36 weeks	25	8.6

Maximum female requiring foetal monitoring during their pregnancy, were between 33-36 weeks i.e. 210 out of 290 which is 72.4%.

Among these patients 149 patients had multiple indications for admission. Out of these 290 patients, 110 (37.9%) had bad obstetrical history, 80 (27.5%) had reduced foetal movements, 60 (20.8%) each had anaemia and previous caesarean section and 45 (15.5%) were diabetic.

Table -V. Indication for fetal monitoring		
Indication	No of cases	% age
Bad obstetrical history	110	37.9
Reduced foetal movements	80	27.5
Anaemia (Hb<8gm/dl)	60	20.8
Previous caesarean section	60	20.8
Diabetes mellitus	45	15.5
Pregnancy induced hypertension	40	13.8
Intrauterine growth retardation	30	10.3
pre-term labor	30	10.3
Antepartum haemorrhage	30	10.3
Polyhdramnios	10	3.5
Rhesus isoimmunization	10	3.5
Cardiac disease	6	2.0
Multiple Pregnancies	5	1.7

Table-VI. Methods of foetal monitoring		
Methods	No of cases	%age
Symphysis fundal height chart	290	100
Ultrasonography	290	100
Cardiotocography (CTG)	200	68.9
Biophysical profile	85	29.3
Doppler blood flow studies	30	10.3

Table-VII. Interpretation of cardiotocography		
Methods	No of cases	%age
Normal non-stress test	115	57.5
Abnormal non-stress test	85	42.5

Out of 290 patients symphysis fundal height measurement and ultrasonography were done in every patient and especially for fetal growth pattern while biophysical profile was done in 85 (34.5%) patients where indicated. Antenatal cardiotocography i.e. non-stress test done in 200 (68.9%) patients.

Out of 290 patients in which CTG was done 115 (57.5%) were normal while 85 (42.5%) had some abnormality.

Table-VIII. Interpretation of abnormal cardiotocography		
	No of cases	%age
Baseline bradycardia	39	45.9
Baseline tachycardia	38	44.7
Loss of variability	8	9.4

39 out of 85 had baseline bradycardia and 38 baseline tachycardia. Corrective measures were done and 61 improved.

Table-IX. Biophysical profile		
Score	No of cases	%age
8-10	55	64.7
4-06	28	32.9
0-02	2	2.4

Table-X. Mode of delivery		
Mode of delivery	No of cases	%age
Spontaneous vaginal delivery	150	51.7
Caesarean section	115	39.6
Ventose delivery	10	3.6
Forceps delivery	6	2
Twin vaginal delivery	5	1.7
Assisted breech delivery	4	1.4

Out of 85 patients in which biophysical profile was performed, 55 (64.7%) had good score i.e. 8-10. In this group biophysical profile was repeated after one week. In 28 (32.9%) patients score was between 4-6 and in these patients biophysical profile was again done within 24 hours. In only 3 (2.4%) patients score was 0-2 and immediate delivery was done and good results obtained.

Among the 290 high risk pregnancies spontaneous vaginal deliveries occurred in 150 (51.7%) and assisted vaginal deliveries in 25 (8.7%). While caesarean sections done were in115 (39.6%) patients. Thus rate of operative delivery in our unit even in these high risk pregnancies was lesser than that of vaginal delivery.

Table-XI. Indication for caesarean section		
Indication	No of case	%age
Previous caesarean section	30	26
Foetal distress	15	13
Failed induction	12	10.4
Failed progress of labor	24	20.8
Pregnancy induced hypertension	6	5.2
Placenta previa	10	8.7
IUGR	8	6.9
Bad obstetrical history	10	8.7

The commonest indication for caesarean section was previous caesarean section 30 (26%) and second most common cause was failed progress of labor 24 (20.8%). Incidence of caesarean section for foetal distress was 15 (13%), for IUGR 10 (8.7%) and for failed induction was 12 (10.4%).

Table-XII. Foetal outcome

Outcome	No of cases	%age
Alive	287	99.3
Still birth	3	1.4

Out of 290 foetuses, monitored in gynae and obstetrics unit I during 2001, only 3 (1.04%) still births occurred. So by doing foetal monitoring we reduced foetal loss markedly.

DISCUSSION

The antenatal foetal monitoring is becoming very important since last two decades. Previously there were more stresses to reduce the maternal mortality rate. But now people are giving equal importance to antenatal foetal monitoring. As a result of recent advances it is now possible not only to identify more reliably the foetus at risk but-also to monitor such foetus in utero thus enabling us to intervene on firmer evidence and well in time.

Antepartum foetal heart rate monitoring remains the most widely accepted diagnostic test for assessment of the foetus at risk of hypoxia. The non stress test (cardiotocography) is the most commonly employed and less time consuming. A study on 401 high risk pregnancies was done by Spellacy in 1971[7]. Out of these 401 patients, 301(77.6%) have normal CTG while 90 (22.4%) had pathological CTG and this relates poor foetal outcome. In our study we had 290 high risk pregnancies, out of which 115 (57.5%) had normal tracing of CTG while 85 (42,5%) had pathological CTG. In patients with normal CTG tracing, the test was repeated twice weekly but in patients with pathological CTG tracing, test was repeated daily with biophysical profile. Freeman had shown that with frequent proper antenatal foetal heart rate monitoring the rate of foetal death could be reduced to 3.2/1000 in high risk pregnancies[8].

The biophysical profile is a method of ascertaining antenatal foetal well being by employing real time ultrasound and cardiotocography. Belizan et al applied the biophysical profile in management of 2400 high risk pregnancies, 1938 (97.1%) had normal, 58 (2.09%) had pathological profile[9]. The perinatal mortality rate to normal profile was 5 (0.3%) and in pathological profile perinatal mortality rate was 9 (35.15%). We did biophysical profile in 85 patients out of which 55 had normal profile while 30 (64.7%) had pathologica profile.

Perinatal mortality rate in pathological profile was 3 (10%). But the biophysical profile is potentially time consuming and where facilities exist. Doppler ultrasound is preferable to the biophysical profile as a second time test of foetal well being since it is performed easily. It would appear reasonable to reserve comprehensive biophysical profile scoring for those foetuses with an abnormal Doppler examination or a CTG which remain non-reactive after prolonged recording.

CONCLUSION

Recognition of foetus at risk and monitoring the well being of such a foetus during pregnancy is an important aspect of obstetrician's work. Traditional history taking, clinical methods, biochemical tests of placental function and ultrasonic assessment of fetal growth, all have been utilized to detect the foetus at risk and to evaluate its condition. All these methods have their drawbacks and limitations. The difficulty often facing the obstetrician is to decide whether he should expedite delivery in the interests of the infant. This is particularly a problem when the foetus is premature. If delivered prematurely, it might develop respiratory difficulties. But once the delivery is delayed in hope to get more maturity, the price of delay might be intrauterine death. This is where dynamic tests like fetal movement charts and antenatal cardiotocography have been a real help. They can indicate how the foetus is behaving on a particular day and thus providing a day-to-day assessment of foetus well being. New developments of techniques to evaluate foetus in the form of biophysical profile and Doppler blood flow studies exist and hold great promise for the future.

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