# "GROWTH TAPE (DEBDAS)" - AN INDIAN NOMOGRAM FOR FETAL GROWTH

A.K. DEBDAS


## SUMMARY

**Growth tape is a measuring tape calibrated in 'week of pregnancy' like - 28 weeks, 30 weeks etc. So, when the height of uterus is measured with this - from the upper border of symphysis pubis to the uterine fundus it gives the growth of uterus (fetus) directly 'in week'. This tape is meant to be used to assess the growth of fetus/uterus during antenatal period from 'week-to-week' - visit-to-visit.**

**Since this tape has been calibrated from the mean value of 100 symphysis - fundal distance for each week of gestation - taken from normal gravidae - this tape constitutes the nomogram of fetal growth of Indian babies.**

**Fetal as assessed by growth tape was found to correspond with gestational maturity in 78% cases and with ultrasonic maturity in 76% cases.**

**Assessment of fetal growth by growth tape (just like checking BP with BP instrument) will bring uniformity in the fetal growth monitoring and remove the guess factor inherant in the current clinical method.**

**Growth tape is indispensable for monitoring fetal growth in IUGR. It is also ideal for rural obstetrics where antenatal care is given by less skilled professionals.**


*Telco Maternity Hospital, Jamshedpur.*
*Accepted for Publication in July' 96*

## *INTRODUCTION*

Since the inception of antenatal obstetric examination to the present time, the clinical method of assessment of progres-

sive fetal growth has been arbitrary and dependant on vague correlation of the height of fundus with three landmarks on mother's abdomen namely upper border of symphysis pubis, umbilicus and xiphisternum. The situation is further worsened by the following facts - firstly, two out of these three landmarks - namely Umbilicus and Xiphisternum can be, even anatomically, somewhat variable in their levels and secondly, these are also maternal (stature) related i.e. the distances between them being longer in tall women and shorter in short women. Hence naturally, this method is associated with high rate of error specially from 32 weeks onwards (Debdas, 1992). The 'Growth tape' as presented here has been devised with the aim to remove the vagueness and reduce the inaccuracy in the assessment of fetal growth.

## WHAT IS GROWTH TAPE ?

This is a measuring tape calibrated 'in weeks' of pregnancy like 28 weeks, 30 weeks etc. rather than in cm. or inch (see Fig. 1) so, when the height of uterus is measured with this - from the upper border of symphysis pubis to the fundus of uterus (see Fig. 2 & 3) it gives the growth of uterus/fetus directly 'in weeks' (Debdas, 1992 and 1993).

Growth tape is meant to be used to assess the growth of the fetus/uterus during antenatal period from 'week-to-week' and visit-to-visit.

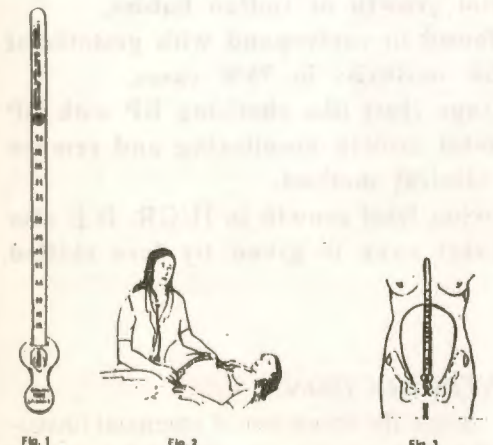

Fig. 1 Growth Tape
Fig. 2 Growth Tape in use
Fig. 3 Placement of the Tape

**Fig. 1, 2 & 3**

## *MATERIALS AND METHOD*

**A: Calibration of the tape** - This constitutes the main part of the study. For the purpose of calibration of the tape in 'week of pregnancy' - it was planned to take 100 measurements of symphysis - fundal distance (height) for 'each week of gestation' from 16th to 40th completed week by a standard centimeter tape. The study subjects were the patients attending the antenatal clinic of Telco Maternity Hospital, Jamshedpur and the period of study was between 1987 - 1990 (Debdas, 1993). The following criteria were employed to select cases for the study - absolutely sure LMP, 28 + 2 days cycle, ultrasonically verified maturity (it is a routine at this hospital to do US scan on all patients between 16-22 weeks), single uncomplicated pregnancy. Patient's age and height were no criteria for selection or exclusion. Seventy four (74%) patients were primigravida. Any patient clinically suspected to be having IUGR was checked by US scan and if confirmed was excluded from the study and so were the cases who developed any other complication during the pregnancy. In addition, patients who delivered babies that weighed less than 2.5 kg. or more than 4 kg were also excluded. Fifty two percent of these patients had a repeat

ultrasound in third trimester for some indication or other which further confirmed the normalcy of growth upto that point. Many of these highly screened patients were used at many visits as they kept on attending the antenatal clinic.

Finally, for each week of gestation, the 100 recorded measurement were averaged to find the mean value for each week, and with these mean values the tape has been calibrated. However, instead of writing the centimeter measurements (which is irrevalent for an obstetrician) its corresponding gestational week has been printed on the tape for getting a readymade instant reading of the fetal growth. For neatness and clarity of reading instead of putting one mark for each week of gestation alternate weeks have been inscribed on the tape as - 16, 18, 20 etc.

**B: Coroboration with ultrasonic biometry finding** - This part of the study was taken up once the tape was made. For this purpose 100 patients were selected from our antenatal population on the above criteria of normalcy of pregnancy and followed from visit-to-visit. All these patients had a second ultrasound between 34 and 40 weeks which excluded IUGR and also the presence of excess and less liquor. A tally was made between growth tape findings and ultrasonic findings - not only at the two points when ultrasound was done - but also at other antenatal visits which the projected ultrasonic growth findings.

## *ANALYSIS OF DATA AND RESULTS*

On matching the growth tape findings with patient's gestational maturity (as calculated from LMP) - the two coroborated in 87% of cases within plus/minus one week. When the same matching was done with the ultrasonic biometry findings - the coroboration percentage was 76 - again within plus/minus 1 week. In both the instances the non-coroboration was more after 36 weeks than at or before 36 weeks. With engaged head it was found that only in 45% cases the tape reading fell short by 2 or more weeks contrary to what is mentioned in most text books (i.e. fundal height drops by 4 weeks as the head engages).

Finally, with the background of above coroboration and the fact that the week markings of the tape represent the mean centimeter value for that particular week-the growth tape clearly constitutes the nomogram of fetal growth for Indian babies.

## *DISCUSSION*

'Growth tape (Debdas)', in principle and function is very similar to 'Gravidogram' designed by Westin (1977) both being based on symphysis - fundal distance in centimeter. In fact, the week markings on growth tape (e.g. 30, 32, 34 etc), since these represent the mean symphysis - fundal distance for each week of gestation, stand as equivalent to the middle line (50the percentile) of the gravidogram chart).

It has been shown by many workers that gravidogram has around 75% correlation (Westin, 1977) both with gestational maturity and also with ultrasonic maturity. This figure correlates quite well with the growth tape results - the corresponding figures for the latter being 78% and 76% respectively.

However, growth tape has the following major advantages over Gravidogram - a) It does not require the special nomogram graph paper, b) It does not involve the

time consuming procedure of - first measuring in centimeter, then plotting the centimeter measurment on the nomogram paper by matching the X and Y axis of it and then finally reading it off. In contrast, growth tape gives an absolutely instant reading of the growth because it itself is the nomogram.

'Growth tape (Debdas)', in fact, can serve as a nomogram for fetal growth for the whole Indian subcontinent because of the close similarity in the population of this region.

## *CONCLUSIONS*

1. Since growth tape represents the NOMOGRAM of fetal growth, for giving more objective and uniform antenatal care, specially on the aspect of fetal growth monitoring, it should be used as a matter of routine in all antenatal clinics.

2. Growth tape can serve as a reasonable alternative to ultrasonography in situations where this facility is not available or affordable since findings of the two tallies in 76% cases.

3. Growth tape will be an ideal tool for RURAL OBSTETRICS because by using this a non specialist - even an ANM can judge whether a case is small for date or large for date so as to be able to refer it to higher centres.

## *REFERENCES*

1. *Debdas, A.K. : FOGSI text book of Obstetrics, edited by Dasgupta S, Roychoudhury N N and Bhaskar Rao. K, Published by FOGSI, Bombay, Page - 70, 1992.*
2. *Debdas, A.K: Abstract Volume, 2nd World Congress of NAVSFWI, Bombay, 15-17 October 1993, P-15, 1993.*
3. *Westin, B: Acta. Obstet Gynec. Scand, 56: 273, 1977.*