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Original Research Article

Study of duration of gestation in 500 patients with spontaneous onset of labor

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ABSTRACT

Background: There have been variations in the length of gestation depending upon the ethnicity of the patient.

Methods: We studied 500 patients with spontaneous onset of labor for their duration of pregnancy from First day of Last Menstrual Period (FLMP).

Results: The average gestational age was 275 days, 5 days earlier than the Expected date of delivery (EDD). 70% of pregnancies ended before EDD, 4.8% on the day of EDD and 25.2% ended after EDD. 35.80% patients completed 39 weeks, 24% completed 40 weeks, 23.20% completed 38 weeks, 11% completed 37 weeks and only 6% completed 41 weeks. Average gestational age was 39.31 weeks for male baby and 39.36 weeks for female baby. Sex ratio derived was 915.7 females per 1000 males. Average birth weight was 2.705 kg.

Conclusions: The implication of this study is that the length of human gestation does vary according to geographic location. This may be due to genetic influences, weather conditions, food habits or some unknown factor. The clinical significance is the decision to consider a term pregnancy and a post-term pregnancy. A majority of the parturient women went in to spontaneous labour at 39 completed weeks, 5 days earlier than 'Expected date of delivery' calculated by Naegele's formula. This possibility should be kept in mind when maturity assessments are made with a view to intervene in the labour process to minimize perinatal complications.

Keywords: Expected date of delivery, Ethnic variation, Gestational age, Preterm

INTRODUCTION

The human gestation time span is generally considered to be 266 days from fertilization to delivery, or for ease of calculations, 280 days from FLMP assuming 28 days of menstrual cycle, with ovulation occurring on 14th day.¹ EDD is usually calculated by Naegele's formula by adding 9 months 7 days to 1st day of the LMP. Irish calculate estimated date of confinement (EDC) from the last day of menstrual period, thus extending the due date.² A fact, long being suspected, and now getting confirmed is, that there is a definite difference in the duration of pregnancy depending on ethnicity and geographic

location of the parturient lady. It is now generally confirmed that the baby decides the time of delivery once it attains enough maturity and is ready to survive in its extra-uterine existence. Babies of different races attain maturity at varying rates. The fetal maturity in South Asian mothers is attained earlier as compared to fetuses of European mothers.^{3,4} There are various factors affecting duration of pregnancy including maternal age, parity, maternal diet, warm weather conditions, anthropometric characteristics, medical complications, cigarette smoking. Mean birth weight and gestational duration were high in light-skinned as compared to dark-skinned people.^{5,6} Dark-skinned mothers are observed to

have the highest rate of early deliveries, followed by Mexican-Americans, Asians and whites.⁷ The median gestational age at delivery was 39 weeks in Afro-asian and Asian races, and 40 weeks in European races in a London based study.^{3,8}

We studied 500 patients with spontaneous onset of labour for their duration of pregnancy from 1st day of Last Menstrual Period. The average gestational age was 275 days, 5 days earlier than the conventional EDD. 70% of pregnancies ended before EDD, 4.8% on the day of EDD and 25.2% ended after the EDD. The value of this knowledge is to change the parameters to consider pre-term labour and post-term labour for Western Indian population. This will also lead to calling pregnancy duration of 41 weeks as post-term instead of the conventionally accepted 42 weeks.

METHODS

This study was conducted in the department of obstetrics 500 patients who ended in spontaneous labor, from November 2014 to March 2015 were recruited for this study. Detailed history including age, menstrual history, obstetric history, past and family history was taken. The Gestational age from FLMP were calculated. Birth weight and gender of newborns were also noted.

We excluded all the confounding variables like planned cesarean sections, patients with induced labor, multiple pregnancies, medical diseases, pregnancies with Intrauterine growth restriction, congenitally malformed fetus, hydramnios and preterm labors from the study, as all these conditions by themselves might affect the pregnancy duration.

Data was collected to calculate the duration of gestation, birth weight of newborn and sex ratio. Data of all the 500 patients were tabulated in Microsoft excel spreadsheet.

RESULTS

T500 patients who went through spontaneous labour were recruited. Out of these 70% (n=350) delivered before EDD, 25.20% (n=126) delivered after EDD and only 4.80% (n=24) delivered on EDD (Table 1).

Table 1: Cases with delivery in relation to EDD.

	No. of cases	Percentage
Before EDD	350	70
On EDD	24	4.80
After EDD	126	25.20
Total	500	100

Gestational age of each patient was calculated in form of completed weeks, where 35.80% (n=179) completed 39 weeks, 24% (n=120) completed 40 weeks, 23.20% (n=116) completed 38 weeks, 11% (n=55) completed 37

weeks and only 6% (n=36) completed 41 weeks (Table 2).

Table 2: Cases as per the gestational age in weeks.

Completed weeks of gestation	No. of cases	Percentage
Thirty seven	55	11
Thirty eight	116	23.20
Thirty nine	179	35.80
Forty	120	24
Forty one	30	6
	500	100

Average gestational age in days was 275 days (Table 3).

Table 3: Cases as per the gestational age in days.

Gestational age in days	Number of cases
259	6
260	7
261	4
262	2
263	13
264	9
265	11
266	10
267	13
268	20
269	25
270	20
271	23
272	18
273	19
274	16
275	17
276	33
277	29
278	26
279	27
280	22
281	26
282	27
283	11
284	11
285	13
286	16
287	5
288	2
289	10
290	3
291	3
292	2
294	1
Total	500

Average birth weight was 2.705 kg. Average gestational age for male baby was 39.31 weeks.

Average gestational age for female baby was 39.36 weeks. The average gestational age difference between both the genders was statistically insignificant. Sex ratio derived was 915.7 females per 1000 males.

DISCUSSION

Gestational age was studied in 500 patients. Most of the patients (70%) delivered before EDD, 25.20% delivered after EDD and only 4.80% delivered on EDD. EDD is calculated by adding 280 days to LMP according to Naegele's formula. But only 4% of babies were born on the day of EDD. Majority of cases (35.80%) completed 39 weeks of gestation. 24% (n=120) and 23.20% (n=116) completed 40 and 38 weeks respectively.

Studies were done on ethnic variations of duration of pregnancy, showing similar results stating shorter duration of pregnancy in South Asians as compared to Europeans. There was also higher incidence of meconium staining (which ultimately suggests fetal maturity) at earlier gestational age in South Asian mothers as compared to European mothers.³

Average gestational age in days was 275 days, 5 days shorter than expected duration of 280 days calculated by Naegele's formula. Table 3 depict distribution of number of cases as per the gestational age in days. Maximum number of cases (n=33) had gestational age of 276 days.

The implication of this study is that the length of human gestation does vary according to geographic location. There is almost a consensus now that the fetus decides own maturity and puts in motion biochemical pathways leading to spontaneous labour. This may be due to genetic influences, weather conditions, food habits or some unknown factor. The clinical significance is the decision to consider a term pregnancy and a post-term pregnancy. We may have to alter the defined term pregnancy to 36 weeks and a post-term pregnancy at 41 weeks, with their obvious distinct management plans. Waiting for completion of 42 weeks to induce a labour may bring harm to women delivering in this part of the world. It is better to derive the time of fetal maturity in various ethnic groups.

Sex ratio calculated from birth of newborn was 915.7 females per 1000 males. As per the details of census 2011, Gujarat had sex ratio of 919 females per 1000 males.⁹

CONCLUSION

This study confirms the widely held belief that the length of gestation in western parts of India is slightly shorter than the accepted 280 days. As per this study, a majority of the parturient women went in to spontaneous labour at

39 completed weeks - with an average pregnancy duration of 275 days - 5 days earlier than 'Expected date of delivery' calculated by Naegele's formula. This also underlines a fact that possibly other communities/geographic locations may also show varied duration of gestation. This possibility should be kept in mind when maturity assessments are made with a view to intervene in the labour process to minimize perinatal complications.

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