

NORMOGRAM FROM FETAL KIDNEY LENGTH BY ULTRASONOGRAPHICALLY

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<p>Article history Received May 22, 2014. Recd. in revised form Mar 20, 2015 Accepted on. Mar 20, 2015 Available online July 01, 2015</p>	<p>Abstract Foetal age estimation is very important. Foetal age can be estimated by variety of parameters such as Femur length, Bi-Parietal diameter, Abdominal circumference, Humerus length and Foetal Kidney length. Previous studies by various authors indicate that 30% of female forget their exact Last Menstrual period (LMP) [1, 2]. If exact LMP is not known then Expected date of delivery was not found. So these types of cases pose a grave challenge for treating doctor. Frequently in the emergency, unregistered antenatal cases come with the history of accident as well as assault with bleeding per vaginum. These types of cases also need treatment or Medical termination under MTP act. So this study was aimed to produce normogram using foetal Kidney length by measuring it sonographically from known registered antenatal cases coming to Gian Sagar. The Normogram was prepared with objective to use it retrospectively when LMP is not known to get foetal age using foetal kidney length</p>
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Introduction

Foetal age estimation is very important. Foetal age can be estimated by variety of parameters such as femur length, bi-parietal diameter, abdominal circumference, Humerus length and foetal kidney length. Previous studies by various authors indicate that 30% of female forget their Last Menstrual period (LMP) exactly [1, 2]. If exact LMP is not known then Expected date of delivery was not found. So these types of case pose a grave challenge for treating doctor. Frequently in the emergency, unregistered antenatal cases come with the history of accident as well as assault with bleeding per vaginum. Now these types of cases require screening, treatment as well as medical termination of pregnancy as per medical

termination of pregnancy act. As per MTP act, in first trimester, for doing MTP opinion of one registered authorized doctor is required and if the patient present in second trimester then opinion of two registered authorized doctor, are required for medical termination of pregnancy [3]. As per medical termination of pregnancy Act, authorized doctor is one who is Registered Medical Practitioner and who has assisted in 25 MTP's and who either possess degree or diploma in obstetric or having six month house job in Obstetrics a Gynaecology department.

Measurement of various foetal body parts is called as foetal biometry. Ultrasonography is done in every ante natal case for measurement of various foetal parts. If the

exact date of last menstrual period is known then it can be useful in correlating the foetal kidney length measurement with gestational age.

No single parameter is sufficient in giving accurate foetal age ultrasonographically. Few useful measurement in the foetus are femur length, length of kidney [4], abdominal circumference and head circumference [5], To avoid reliance on single biometric factor, multiple factors are advised to consider together [5].

Previous studies suggest that measurement of kidney length is useful between 24th to 38th weeks [4]. Before 36 weeks, Femur length and bi-parietal diameter have more value but after 36 weeks head circumference and femur length is more reliable [5]. Length of femur is also better parameter as compared to bi-parietal diameter for determination of age of foetus in the third trimester [6]. It is well known that ethnicity has a significant influence on foetal biometry [7, 8].

Foetal Kidney length measurement is less frequently used for estimating the foetal gestational age. Thus this study was aimed to know the gestational age from foetal kidney length along with other parameters ultrasonography.

Material and method

This is study done from already collected data from the antenatal cases coming to Gian Sagar Medical College, Patiala, Punjab, India for routine Ultrasonography during pregnancy. Total of 271 case visits were taken. Cases where LMP (Last menstrual period) is not known exactly were discarded from the study. Cases with foetal congenital and developmental abnormalities were excluded. Consent of every volunteer patient was taken. Foetal kidney length was recorded during routine foetal ultrasonography for wellbeing by single person to avoid person bias. We had prepared a graph/normogram from the available data. Then this graph could be used for age determination of foetus if exact LMP is not known, from the kidney length of the foetus in medico legal cases.

Observation and Result

With the help of ultrasonic examination of these volunteer cases, the measured Foetal Kidney length is presented in tabulated form.

Chart no 1 shows location based distribution of cases taken in this study depicted that most of the cases belong to Punjab state.

Chart 2 shows age wise distribution of cases taken in this study.

Table no 1 shows the Foetal Kidney length at different lunar months of gestational while chart 3 is showing its graphical representation. Table no 2 shows the tabulated form of foetal kidney length at different weeks of gestation while chart 4 is showing its graphical representation. According to present study, minimum foetal kidney length at 24 weeks of pregnancy is 23.37 mm and maximum at 39 week is 39.18 mm.

Discussion

We had prepared the charts or graphs from the available ultrasonic data of foetal kidney length especially for Punjab region. Trend line was also drawn. These trend line and graphs of foetal kidney length obtained ultrasonically can be used to determine the age of foetus in medicolegal cases of assault on pregnant mothers who don't know her LMP's exactly as well as to other general cases. The expected date of delivery (EDD) can also be calculated by using these charts or graphs after getting LMP where last menstrual period is not known. These charts are more useful in North Indian region population as these are directly produced from local population. On the whole, if one variable is known, we can calculate the other variable from these graphs and trend line. Since minimum Foetal Kidney length is 23.37 mm and found at 24 weeks, so this parameter cannot be used for getting gestational age in first and second trimester of gestation for Medical termination of pregnancy as per MTP act.

As per study done by previous authors, the mean foetal kidney length increased from 23.87 at 24 weeks to 36.25 mm at 38 weeks [9] and also in our present study, the average foetal kidney length is 23.37 mm at 24 weeks and 39.18 mm at 39 weeks.

Good curves in the graphs were obtained when horizontal axis becomes lunar month gestational age [9].

Conclusion

Our new set of Normogram and table for foetal kidney length is ready for Punjabi population group. This chart can be used to get gestational foetal age in pregnant patients who have forgotten their last Menstrual period after getting foetal kidney length ultrasonically from 24 weeks onwards only.

Conflict of interest

None

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Chart 1 showing location wise distribution of cases

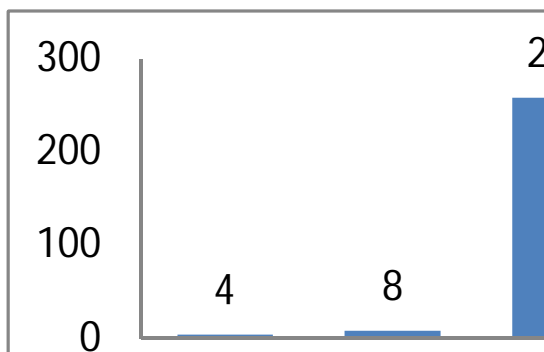


Chart 2 showing age wise distribution of cases

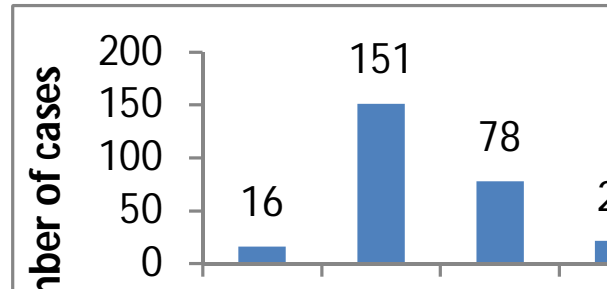


Table 1 showing Average Kidney length in relation to lunar months of pregnancy

Gestational Age (in lunar months)	Average Kidney Length (In mm)
7	25.92
8	30.86
9	33.94
10	37.30

Chart 3 showing Average Kidney Length in relation to lunar months of pregnancy

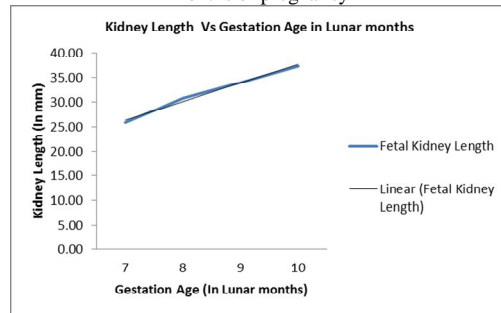


Table 2 showing Average foetal kidney length in relation to weeks of pregnancy

Gestational Age (in wks)	Average Kidney Length (In mm)	Gestational Age (in wks)	Average Kidney Length (In mm)
24	23.37	32	32.82
25	25.40	33	32.63
26	26.63	34	33.79
27	27.78	35	36.54
28	28.91	36	36.41
29	30.03	37	36.28
30	30.21	38	37.83
31	32.11	39	39.18

Chart 4 showing Average foetal kidney length in relation to weeks of pregnancy

