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Measurement of Obstetrical Conjugate Diameter by USG and its association with mode of Delivery.

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Abstract and keywords: *Pelvic assessment done by measuring the Obstetrical Conjugate Diameter by transabdominal Ultrasonography at term can provide additional information for assessing the Maternal Pelvis to the clinician and may be helpful in planning route of delivery. Method: Study population consisted of 150 pregnant women divided into four groups. Group one consists of those having OCD less than 10 cm, Group two consists of those with OCD 10-10.9 cm, Group three consists of those with OCD 11-11.9 cm and Group four consists of those with OCD more than or equal to 12 cm. Their modes of delivery were than recorded and data were analysed. Result: Caesarean section performed in the study population was 30.7%.Obstetric conjugate diameter was inversely correlated with the caesarean section rate. OCD measuring less than 10 cm were associated with 100% caesarean section. OCD measuring 10 cm to 10.9 cm was associated with 39.7% caesarean section, OCD measuring 11 cm to 11.9 cm was associated with 18.9% caesarean section and OCD measuring more than or equal to 12 cm was associated with 10 % caesarean section. Conclusion: Decrease in Obstetric conjugate diameter is associated with an increase in caesarean section delivery. OCD of less than 10 cm is associated with 100% caesarean section delivery in this study. The finding will also be useful while considering vaginal deliveries in subsequent pregnancies.*

Keywords: *obstetric conjugate diameter, OCD, caesarean section.*

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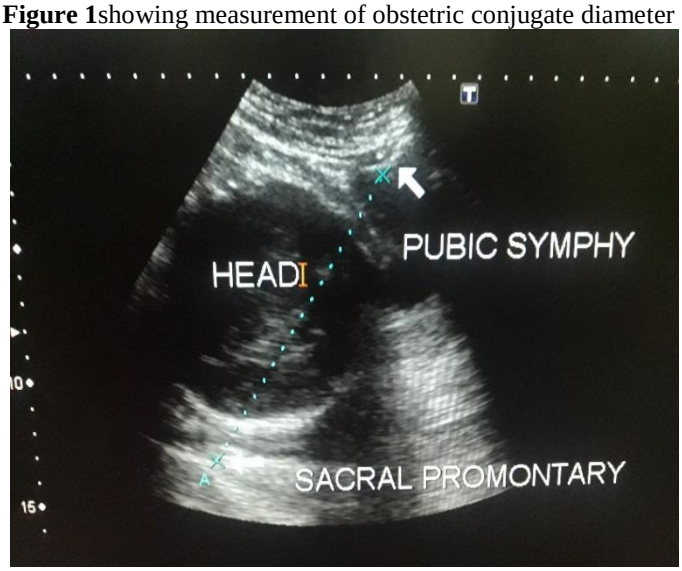
I. Introduction

Pelvimetry plays a very important role for planning the route of delivery. Clinical Pelvimetry is an acceptable method of pelvis assessment. However, observer bias may be there and if the patients does not co-operate it may be impossible to assess the Maternal Pelvis properly. In the current Obstetrical Practice, X Ray Pelvimetry which was used earlier is no longer acceptable due to radiation hazards. On the other hand, MRI is very costly and beyond the reach of most of the common people. Pelvic assessment done by measuring the Obstetrical Conjugate Diameter by transabdominal Ultrasonography at term is a cheap, affordable, non-invasive & easily available method. It can provide additional information for assessing the Maternal Pelvis to the clinician and may be helpful for planning route of delivery.

II. Materials and Methods

This was a study done in Jawaharlal Nehru Institute of Medical Sciences, Imphal, Manipur a tertiary referral Hospital. This was a Cross Sectional non-invasive study. The Study Period was from 1st April 2017 to 30th September 2017 for duration of 6 months. Study population consisted of 150 pregnant women. Inclusion Criteria were normal un-complicated Term Pregnancy, Primigravidae with Cephalic Presentation. Exclusion Criteria were Multigravidae, Multiple & complicated Pregnancies, Period of gestation less than 37 weeks, Non-cephalic presentation, Placenta praevia, Congenital anomalies, big and small for date babies. A thorough history was taken and characteristics were noted including maternal age, parity and period of gestation at the time of examination. Their mode of delivery was recorded afterwards. Patients were examined by Transabdominal USG scan using real time, gray scale, two dimensional ultrasound machine with 3.5 MHz curvilinear probe. After routine USG scan for foetal wellbeing, obstetric conjugate was measured. The technique used by Katanozaka M et al [1]was followed to measure the obstetric conjugate. Oval shaped image of the pubic symphysis is observed. Internal end of the oval image was taken as the first point. Second point for measurement is the sacral promontory. The distance between these two points were considered as the USG obstetric conjugate diameter.

Figure 1showing measurement of obstetric conjugate diameter



The patients were then divided into four groups. Group one consists of those having OCD less than 10 cm, Group two consists of those with OCD 10-10.9 cm, Group three consists of those with OCD 11-11.9 cm and Group four consists of those with OCD more than or equal to 12 cm. Their modes of delivery were than recorded and data were analysed using appropriate statistical methods. P value of <0.05 was taken as statistically significant.

III. Observation

A total of 150 eligible individuals were participated in this study. Table 1 shows the characteristics of the study populations. Out of 150 patients in this study 39.7% (46 patients) delivered by caesarean section while 69.3% (104 patients) were delivered by vaginal delivery. Ratio of caesarean section and vaginal delivery was 1:2.3. Patient having caesarean section had a mean age of 28.97 ± 0.79 and mean period of gestation was 38.7 weeks ± 0.16 while 104 patients delivered vaginally had a mean age of 27.9 years ± 0.5 and mean period of gestation were 38.8 ± 0.1. There was no statistically significant difference in terms of mean age of the mother and period of gestation between those delivered by vaginal route and abdominal route as shown in table 1.

Table 1 showing Characteristics of the study participants (n=150)

parameters	Vaginal delivery Mean ± SE	Caesarean section mean ± SE
Mean age of mother	27.9±0.5.	28.97±0.79
Mean period of gestation	38.8±0.1	38.7±0.16

Caesarean section performed in the study population was 30.7%.Obstetric conjugate diameter was inversely correlated with the caesarean section rate. A lower OCD means a higher caesarean section rate and a higher OCD means a lower caesarean section rate. OCD measuring less than 10 cm were associated with 100% caesarean section. OCD measuring 10 cm to 10.9 cm was associated with 39.7% caesarean section, OCD measuring 11 cm to 11.9 cm was associated with 18.9% caesarean section and OCD measuring more than or equal to 12 cm was associated with 10% caesarean section. Chi Square test was 33.915 with degree of freedom (DF) 3 and it was found to be statistically significant. In this study there was significant association between obstetrical conjugate diameter and mode of delivery as shown in table 2.

Table 2 showing association of obstetrical conjugate diameter and mode of delivery

Obstetrical conjugate diameter	Vaginal delivery N (%)	Caesarean section N (%)	Total
‹ 10 cm	0	10(100%)	10
10-10.9 cm	35(60.3%)	23(39.7%)	58
11-11.9 cm	43(81.1%)	10(18.9%)	53
≥ 12 cm	26(89.7%)	3(10.3%)	29
Total	104	46	150

Chi square 33.915, degree of freedom 3, p=0.000 <0.05, statistically significant.

IV. Discussion

Contracted pelvis if not detected early may result in maternal mortality and various forms of morbidities. Timely detection of fetomaternal disproportion and timely intervention is the best preventive measure to reduce mortality and morbidity. If the obstetric conjugate is less than 10 cm it is considered contracted [1]. USG Pelvimetry can add additional information to clinical Pelvimetry. Ultrasonographic obstetric conjugate diameter is not the same as radiographic obstetric diameter. It is slightly larger than the radiographic obstetric conjugate (Katanozaka et al [2]). However, since the Radiopelvimetry is no longer used in current obstetric practice and MRI Pelvimetry being highly costly and beyond reach of the common woman this non-invasive easily affordable, reliable method will be helpful to the clinician for decision making. Patients with narrow pelvic inlet based on the obstetric conjugate diameter measurements can be identified and mode of delivery can be planned accordingly. In this study all the patients with OCD less than 10 cm required caesarean section which was in agreement with other workers [3].In our study caesarean section rate in those with bigger OCD of more than or equal to 12 cm was lower (10%). Katanozaka et al [2] got a lower Caesarian section rate of 7.1% while Bathla Sonai et al [4] got a caesarean section rate of 11.7% which was similar to this study. USG Pelvimetry will be particularly useful in those cases with previous caesarean section and suspicion of Cephalopelvic disproportion.

Table 3 showing comparison of various studies

OCD in cm	Present study 2017	Katanozaka et al 1999	Bathla et al 2006	Mohammad et al 2013
‹ 10	100%	50%	50%	100%
10 – 10.9	40%		3.21%	77.4%
11 – 11.9	19%			65.4%
≥ 12	10%	7.1%	11.7%	11.5%

IV. Conclusion

Decrease in Obstetric conjugate diameter is associated with an increase in caesarean section delivery. OCD of less than 10 cm is associated with 100% caesarean section delivery in this study. Measuring Obstetrical Conjugate Diameter by Ultrasonography is a safe, simple, economical, reliable non-invasive procedure. It can be performed even in labouring patients & it will be helpful to the clinician in planning mode of delivery. The finding will also be useful while considering vaginal deliveries in subsequent pregnancies.

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