Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/16639
DOI URL: http://dx.doi.org/10.21474/IJAR01/16639

RESEARCH ARTICLE

ULTRASONOGRAPHIC MORPHOMETRIC ANALYSIS OF UTERUS IN NULLIPAROUS AND MULTIPAROUS FEMALES ATTENDING TERTIARY CARE HOSPITAL

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Manuscript Info

Manuscript History
Received: 10 February 2023
Final Accepted: 14 March 2023
Published: April 2023

Key words:-
Ultrasonography, Uterine Dimensions, Longitudinal Length, Anteroposterior Diameter and Transverse Diameter

Abstract

Background: Uterus is considered as a major reproductive organ in women which is responsible for pregnancy and delivery of the foetus. The dimensions of the uterus can act as the markers for the reproductive health of the women. The dimension of the uterus deviates from the normal dimensions in the presence of any anomalies. Therefore, the uterine dimensions can help in predicting the reproductive health of the women and help in the treatment. Ultrasonography is an overexploited technique due to the key advantages it provides in diagnoses purposes. The uterine dimension can easily be measured by this technique.

Aims and Objectives: To measures the uterine dimension using Ultrasonography of women lying in the age group of 15-45 years. Methods- Uterine dimensions of 200 nulliparous and parous women were measured in the study and comparison were made from the normal counterparts.

Results: Women lying in 15-25 years of age were having the mean longitudinal length as 6.43Â±0.24 cm, mean Anteroposterior diameter as 2.96Â±0.33 cm and mean transverse diameter as 3.77Â±0.45cm. In age group of 26-35 years, the mean longitudinal length was 7.72Â±0.630, mean anteroposterior diameter was 3.59Â±0.42 cm and mean transverse diameter was 4.42Â±0.52 cm. In age group of 36-45 years the mean longitudinal length was 8.57Â±0.55, mean anteroposterior diameter was 4.12Â±0.45cm and mean transverse diameter was 4.93Â±0.46cm.

Conclusion: Our study showed a significant increase in uterine dimensions with Age and Parity. These values are of immense importance for predicting and later on diagnosing any uterine pathology affecting its dimensions.

Introduction:-

The uterus is an important reproductive organ in women which performs a variety of reproductive function like gestation, menstruation, implantation, and delivery[1]. It is a hollow andpear-shapedmuscular organ which is anatomically divided into four regions i.e., fundus, corpus, cervix, and cervical canal. The normal size of an adult women is 7.6 cm long, 4.5 cm broad, and 3.0 cm thick[2,3].

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The uterine dimension of a women can help us in assessing the reproductive health of them and can also help us to foresee various diseases and anomalies[4,5].There are 7 broad categories into which the uterine anomalies are divided by American fertility society. These anomalies are Mullerian agenesis, Unicornuate uterus, Didelphous uterus, Bicornuate uterus, Septate uterus, Arcuate uterus and DES exposes uterus[6]. The uterine dimensions are deviated from the normal dimensions when any of the above anomalies are present. Uterine dimensions can accurately pinpoint the clinical pregnancy rates and causes of infertility[7]. A small uterus indicates a developmental aberration oy hypoplasia, also these women have higher risk of miscarriage and unsuccessful implantation[8,9]. Unproportionally decreased uterine dimensions may be linked to subfertility[10].

There are numerous studies which measured the dimension of uterus of women belonging to different age group and geographical backgrounds. There are studies conducted by [3,11,12] They measured the uterine dimension of women with a wide range of age and parity. Another study conducted by verguts and his team measured the anteroposterior uterine dimension of 5466 non pregnant females to conclude that at 40 years of age the length was increased to 7.2 cm and decreased to 4.2 cm at 80 years of age[13].

Measurement of uterine dimension are largely carried out by using Ultrasonography (USG). USG is used for its numerous advantages like high accuracy, less time consumption, uncomplicated, harmless and non-invasive procedure. Another key benefit is it does not pose any risk associated with ionizing radiation[14,15]

In this study we have measured the uterine dimension of women between the age of 15 to 45 years. We have classified them according to parity (Nulliparous and parous) and measured the dimensions. We have distributed the women who were having anteverted and retroverted uterus. We assessed the 3 dimensions of uterus i.e., the longitudinal length, anteroposterior and transverse diameter of the uterus. This study depicts the relation in dimension of uterus in different age group and their parity. Also, how the uterine dimension deviates from their normal counterparts.

Material And Methods:-

A commercially available real time US Machine was used to perform Transabdominal sonography. A 3.5 MHz sector transducer with acoustic gel was used as a coupling medium. This prevented the inherent interference by air between the anterior abdominal wall and skin and transducer. Females were instructed to drink about 1 litre of water before sonography to promote diuresis and refrain from micturating until the sonography was performed. In US the women were scanned in supine position in both longitudinal and transverse planes.

Inclusion and Exclusion criteria

Women between the age of 15 and 45 years with no pelvic pathology were included. Whereas women who were pregnant, suffering with uterine pathology and who were undergone any uterine surgery or hysterectomy were excluded from the measurement study.

Ultrasound Measurement:-

The longitudinal dimensions in sagittal section were measured from the highest fundal point in the midline to the corresponding midline cervical point. Cervical length was not measured separately instead it was included in longitudinal length.At the widest fundal dimension, the anteroposterior diameter in sagittal section at 90˚ to the longitudinal plane was measured.Greatest transverse diameter was measured in transverse section.All the measurement were measured in centimetre to the nearest decimal point.For evaluation of the longitudinal length and anteroposterior diameter, we placed the probe of the USG on suprapubic area in the longitudinal direction. The determination of transverse diameter is done after rotating the probe by 90˚.

Statistical analysis

The statistical analysis was done using SPSS software by applying one way ANOVA for significance.

Results:-

Patients Demographics

We measured the uterus dimension of 200 females between 15 and 45 years of age. The mean age of the 200 women were 30.27 ± 7.70 years. We distributed the 200 women in 3 age groups i.e., from 15-25 years, 26-35 years, and 36-

45 years with frequencies of 60, 84 and 28 respectively. The percentage wise distribution of women of different age groups are shown in figure 1.

Categorisation of women into parous and nulliparous
We also classified women into parous (having offspring) and nulliparous (no offspring). we examined 140 parous and 60nulliparous women. The percentage wise distribution of these is women is shown through a pie chart in figure 2.

Distribution into anteverted and retroverted
we also classified women having anteverted and retroverted uterus. Among the 200 women,we measured the uterine dimension of 148 women who were having anteverted uterus and 52 women who were having retroverted uterus. Percentage wise distribution of these women are shown in figure 3.

Uterine dimension of women lying in different age group.
We measured longitudinal, anteroposterior, and transversediameter of uterus in different age group of women. Women lying in 15-25 years of age were havingthe mean longitudinal length as6.43±0.24cm,mean Anteroposterior diameteras 2.96±0.33 cmandmean transversediameteras3.77±0.45cm.Inagegroupof26-35years,themeanlongitudinallengthwas7.72±0.630,mean anteroposteriordiameter was3.59±0.42cmandmean transversediameter was4.42±0.52cm. Inagegroupof36-45yearsthemeanlongitudinallengthwas8.57±0.55,mean anteroposteriordiameter was4.12±0.45cmandmean transversediameter was4.93±0.46cm**.**

The meanLongitudinal length,Anteroposterior diameter andTransverse diameter of women is shown in table 1 along with statistical significance

Uterine dimension of women with different parity.
The dimension of 140 parous and 60 nulliparous women were measured which is shown in table 2. The Longitudinal length,Anteroposterior diameter, andTransverse diameter were measured, and mean was calculated. The mean Longitudinal length,Anteroposterior diameter, andTransverse diameter in Nulliparous women were 6.43±0.23, 2.95±0.32, and 3.76±0.44 respectively. Whereas the mean Longitudinal length,Anteroposterior diameter, andTransverse diameter in parous women were 8.04±0.69, 3.81±0.51, and 4.63±0.56 respectively.

Discussion:-

Different uterine dimension is a useful criterion to assess various diseases and anomalies. As the normal size of uterus in an adult woman is 7.6 cm long, 4.5 cm broad, and 3.0 cm thick. Studies conducted on the measurement on the uterine size of women from different age group belonging to different geographical background. One study reported the mean longitudinal length as 6.74±0.70cm, anteroposterior diameter as 4.45±0.73cm and transverse diameter as 5.47±0.95cm[11].In another study reported the uterine dimension of nulliparous women and reported the mean longitudinal length as 6.4±0.4cm, anteroposterior diameter as 3.3±0.3cm and transverse diameter as 5.1±0.2cm[16]. Parmar and his team reported the mean longitudinal length, anteroposterior diameter,and transverse diameter as 9.07cm, 4.14cm, 5.19cm respectively for parous women and 7.14cm, 3.27cm, 4.52cm respectively for nulliparous women[3]. An Indian team reported the mean longitudinal length, anteroposterior diameter, and transverse diameter as 7.71±0.47cm, 3.75±0.31cm and 4.63±0.31cm respectively[7].

In the current study we measured the uterine dimension of 200 women where the meanLongitudinal length,Anteroposterior diameter, andTransverse diameter of all the 200 women lying in the age group of 15-45 yearswas7.56±0.95 cm,3.50±0.60 cm and 4.37±0.59 cm respectively. Later, we divided them in different age groups of 15-25 years, 26-35 years, 36-45 years. We concluded that the dimension of uterus was increasing with the increase in age. The uterine dimension of women lying in the age group of 15-25 were having a smaller uterus size as compared to the normal adult. Whereas the women lying in the age group of 26-35 were having almost the same size as normal adult and women of 36-45 were having a comparatively larger uterus size than the normal adult.

Later we measured the uterine dimension of all 200 women and assessed the data according to parity.We concluded that nulliparous women were having a smaller uterus than the parous and normal adult, whereas the uterine dimension of parous were greater than the normal adult women.

The data also suggest that most of the nulliparous women were lying in the age group of 15-25 years as the dimension of uterus are almost similar in both the data set. Whereas the uterine dimensions of parous women were approximately the mean of women lying in age group of 26-35 years and 36-45 years of age. Comparing our data with another study in Indian context, uterus dimension measured by us was not highly deviated but was on the lower side from the previous conducted study[7]. This suggest that uterine dimensions are also affected by the geographical conditions present with the country or across the country and need

Conclusion:-

The findings concluded in our study throws light on the normal uterine dimensions in general population of females of reproductive age group i.e. from 15-45 years of age in north Indian population. We also calculated mean uterine dimensions in various age groups as well as according to their parity Our study showed a significant increase in uterine dimensions with Age and Parity. These values are of immense importance for predicting and later on diagnosing any uterine pathology affecting its dimensions

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