Original Article

Measurement of Uterus Sizes Of Multiparous Women using Ultrasound

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INTRODUCTION

The human uterus is a pear-shaped fibromuscular organ that can be split into the upper muscular uterine corpus and lower fibrous cervix [1]. It is positioned in the female pelvis between the urinary bladder anteriorly and the rectum posteriorly [2]. It is divided into three basic parts: fundus, body and cervix which reaches into the vaginal area [3]. The internal os is crossed by the uterine canal which emerges as the external os at the vaginal vault [4]. The uterine and ovarian arteries, which branch out from the internal iliac artery's anterior branch, supply blood to the uterus [5]. The main blood vessels supplying blood to the uterus are the uterine arteries [6]. In a multiparous woman, the cervical os is circular but becomes a transverse slit [3]. The cervix is generally solid, but during pregnancy it feels soft [7].

Uterus is divided into two parts, the cervix, and the corpus [8]. The measurements of a typical uterus are 7.8 x 4.5 x 3cm [9]. The size of the uterus is determined by parity rather than age because ovarian hormone levels drop after menopause, and uterine sizes shrink [10]. The mesometrium (the largest piece), the mesosalpinx (mesentery of the uterine fallopian tubes), and the mesovarium make up the broad ligament (connects the ovaries to the broad ligament). The following structures are found in the broad ligament: Fallopian tubes are the tubes that connect the uterus to the fallopian Ovaries [11] For both the mother and the fetus, uterine rupture is a life-threatening peripartum condition. A previous cesarean delivery is the greatest risk factor for uterine rupture,
which increases the risk to 0.5 percent [12]. Medical reasons force about a quarter of women who have had a previous cesarean delivery to deliver early. Labor induction during TOLAC (trial of labor after cesarean delivery) raises the risk of uterine rupture even more. The danger is considered to be between 1.4 and 2.3 percent [13]. The uterus grows slowly during fetal life until the end of the first trimester when it grows at a higher rate due to increased maternal estrogen production. As a result of this continuation of the maternal oestrogen the uterus shrinks immediately after delivery. Uterine length is less than 35 mm between the ages of 2 and 8 with an anteroposterior diameter of 10 mm[14,10]. Subjects are scanned in a supine position in both longitudinal and transverse plans in US examination [15]. The uterine assessment, such as pelvic ultrasound, should be part of the first evaluation of women who have lost several pregnancies [16]. The post-cesarean uterus is frequently ante flexed, and myometrial loss of about 50% is common [17]. The uterine flexion angle can be changed to a more retroflexed position after a caesarean delivery [18]. Gigantic polyps are most common in multiparous women in their 50s. At the time of presentation, these giants cervical polyps are usually misdiagnosed as malignant neoplasm. In multiparous women with something is coming out per vagina, a huge polyp of the cervix anterior lip occurs [19]. Curettage between the 2nd and 4th weeks after delivery is most likely than any other endometrial trauma to produce adhesions. Infertility, recurrent abortion, or menstrual irregularity following any uterine trauma should alert the doctor to the possibilities of intrauterine adhesions. Uterine myomas are the most frequent benign solid pelvic tumors in women, affecting 20-25% of reproductive-age women. Dysmenorrhea, repeated pregnancy loss, and premature birth are all symptoms of submucosal myomas [20]. The mullerian ducts didelphys is a rare congenital abnormality of the uterus [21]. Uterine fibroids are one of the most common uterine disorders affecting roughly 12% to 25% of women of reproductive age. Menorrhagia, frequent urination, and dysmenorrhea are all indications of benign neoplasm [22]. Over 10% of all pregnancies are complicated by preeclampsia (PE) and fetal growth restrictions (FGR) which contributes considerably to fetal and maternal morbidity and mortality [23]. A tangle of aberrant arteriovenous connections in or around the uterus is known as a uterine vascular malformation(UVM) [24]. On the 10th day, the endometrial cavity was substantially bigger in multiparous women, and the uterine cavity was mostly echo-negative [25]. The current study was intended to measure uterus dimension in multiparous women using ultrasound and to correlate the measurement of uterus with number of parities. This current study ensures that there is no significant relationship between a patient’s age and uterus measurement.

M E T H O D S
A cross-sectional study was conducted in the department of Radiology of a private sector hospital in Gujrat, Pakistan. Subjects for this study were only female from 20 to 50 years who have undergone ultrasound examination, this study was conducted over 4 months from December 2021 to March 2022. A total of 41 patients were selected using a convenient sampling approach. An informed written consent form was also signed by patients. The ultrasound was done using a 3.5 MHz probe. The patients demographic statistics were collected on a specially designed data collecting sheet. The data were analyzed using the SSPS V20.0.

R E S U L T S
The current study was conducted among 41 females for the study measurement of uterus sizes in multiparous. The study was conducted among different age groups ranging from 20-50 years. Table 1 shows the number of parities among female patients with most females reported to the radiology department were having highest frequency 15 (36.6%) and least female reported low frequency 2(4.9%).

| Number of party | Frequency | Percent |
|----------------|-----------|---------|
| 1              | 6         | 14.6    |
| 2              | 15        | 36.6    |
| 3              | 11        | 26.8    |
| 4              | 7         | 17.1    |
| 5              | 2         | 4.9     |
| Total          | 41        | 100.0   |

Table 1: Frequency distribution of the Parity

Table 2 shows the uterine length, width, and thickness with an average length measuring 7.9±1.15, width 4.3±0.77, and thickness 3.5±0.67.

| Descriptive Statistics | N  | Minimum | Maximum | Mean±SD |
|------------------------|----|---------|---------|---------|
| Uterus Length          | 41 | 6.20    | 10.30   | 7.9±1.15|
| Uterus Width           | 41 | 3.20    | 6.40    | 4.3±0.77|
| Uterus Thickness       | 41 | 2.20    | 5.90    | 3.5±0.67|

Table 2: Descriptive statistics of uterine measurements

Table 3 shows the correlation between many parities and uterus length there is no significant relationship between them because the value in the “Sig.(2-tailed)” is 0.607 which is more than 0.05.

| Correlation between parity and uterus length | Parity | Uterus Length |
|---------------------------------------------|--------|---------------|
| Number of Parity                           | Pearson Correlation | .083 |
|                                            | Sig.(2-tailed)     | .607 |
|                                            | N         | 41            |
| Uterus Length                              | Pearson Correlation | .083 |
|                                            | Sig.(2-tailed)     | .607 |
|                                            | N         | 41            |

Table 3: Correlation between number of parity and uterus length

Table 4 shows the correlation between number of parity.
and uterus width there is no significant relationship between them because the value in the "Sig. (2-tailed)" is 0.640 which is more than 0.05.

| Correlation between parity and uterus width | Parity | Uterus Width |
|-------------------------------------------|--------|--------------|
| Number of Parity                          |        |              |
| Pearson Correlation                       | 1      | -.075        |
| Sig. (2-tailed)                           | N      | 41           |
| Uterus Width                              |        |              |
| Pearson Correlation                       | -.075  | 1            |
| Sig. (2-tailed)                           | .640   | 41           |

**Table 4:** Correlation between number of parity and uterus width

Table 5 shows the correlation between number of parity and thickness. There is no significant relationship between them because the value in the "Sig. (2-tailed)" is 0.983 which is more than 0.05.

| Correlation between parity and uterus thickness | Parity | Uterus Thickness |
|-----------------------------------------------|--------|------------------|
| Number of Parity                              |        |                 |
| Pearson Correlation                           | 1      | -.003           |
| Sig. (2-tailed)                               | N      | 41              |
| Uterus Thickness                              |        |                 |
| Pearson Correlation                           | -.003  | 1               |
| Sig. (2-tailed)                               | .983   | 41              |

**Table 5:** Correlation between number of parity and uterus thickness

**Discussion**

Human uterus is a pear-shaped fibromuscular organ that can be split into upper muscular uterine corpus and lower. Its dimension changes relative to the number of parity and there is no association of uterus measurement with patient age. A total of 41 patients were selected using a convenient sampling approach. The current study included females from age ranged from 20 to 50 years to estimate uterine size in multiparous women using ultrasound. The current study concluded that the size of uterus in multiparous women is unaffected by number of parities. According to the current study the average uterus length was 7.9±1.15, width 4.5±0.77, and thickness 3.5±0.66 in diameters. The current study found no association between uterus size and number of parity because the value in the "Sig. (2-tailed)" is 0.983. Another descriptive cross-sectional study by Ahmed published in 2017 carried out in Hassahesa teaching hospital had similar results that there is no significant correlation between uterus thickness and number of parity because the value in the "Sig. (2-tailed)" is 0.647 [26]. The current study showed that there is no correlation between the number of parity and patient’s age with uterus length, width, and thickness. The similar findings were also concluded in previous studies by Mohammed et al., 2020 [3] and Ahmed 2017 that also shows there is no association of uterus sizes with age and frequency of parity in females [26].

**Conclusions**

In conclusion, the average uterus length 7.9±1.15, width 4.5±0.77, and thickness 3.5±0.66 in diameters. The current study also found no correlation between the number of parities and the length, width, and thickness in diameters of the uterus. Furthermore, the study found that uterus length, width, and thickness in diameters had no significant link with patient age, weight, or height.

**References**

[1] Tsili AC. Uterus: Normal Findings. MRI and CT of the Female Pelvis; Springer; 2017:45–60.
[2] Gossman W, Fagan S, Sosa-Stanley J, Peterson D. Anatomy, abdomen and pelvis, uterus. 2017.
[3] Mohammed ANA. Measurement of Uterine Size in Multiparous Women Using Ultrasonography: Sudan University of Science And Technology; 2016.
[4] Ellis HJA, Medicine IC. Anatomy of the uterus. 2011 March;12(3):99-101.
[5] Puntambekar S, Puntambekar S, Telang M, Kulkarni P, Date S, Panse M, et al. Novel Anastomotic Technique for uterine transplant using utero-ovarian veins for venous drainage and internal iliac arteries for perfusion in two laparoscopically harvested uteri. Journal of Minimally Invasive Gynecology 2019 Jun: 26(4):628-635. doi: 10.1016/j.jmig.2018.11.021.
[6] Ameer MA, Fagan SE, Sosa-Stanley JN, Peterson DCJS. Anatomy, abdomen and pelvis, uterus. 2021 Aug.
[7] Ellis H. Anatomy of the uterus. Anaesthesia & Intensive Care Medicine. 2011 Mar;12(3):99-101.
[8] Tamura K, Hasegawa K, Katsumata N, Matsumoto K, Mukai H, Takahashi S, et al. Efficacy and safety of nivolumab in Japanese patients with uterine cervical cancer, uterine corpus cancer, or soft tissue sarcoma: Multicenter, open-label phase 2 trial. Cancer Science. 2019 Sep; 110(9):2894-2904. doi: 10.1111/cas.14148.
[9] Ezzedine D, Norwitz ERJCo. gynecology. Are women...
with uterine fibroids at increased risk for adverse pregnancy outcome? Clinical obstetrics & gynaecology. 2016 Mar; 59(1):119-27. doi: 10.1097/GRF.0000000000000169.

[10] Parmar AM, Agarwal D, Hathila N, Singel TJJJoMS, Education. Sonographic measurements of uterus and its correlation with different parameters in parous and nulliparous women. 2016 Jul; 3:306-310.

[11] Craig ME, Sudanagunta S, Billow M. Anatomy, abdomen and pelvis, broad ligaments. 2018.

[12] Al-Zirqi I, Stray-Pedersen B, Forsén L, Vangen SJBAoO, Gynaecology. Uterine rupture after previous caesarean section. British journal of obstetrics and gynaecology. 2010 Jun; 117(7):809-20. doi: 10.1111/j.1471-0528.2010.02533.x.

[13] Hochler H, Wainstock T, Lipschuetz M, Sheiner E, Ezra Y, Yagel S, et al. Induction of labor in women with a scarred uterus: does grand multiparity affect the risk of uterine rupture? American Journal of Obstetrics and Gynecology MFM. 2020 Feb; 2(1):100081. doi: 10.1016/j.ajogmf.2019.100081.

[14] Esmaelzadeh S, Rezaei N, HajiAhmadi MJE-EMHJ, 10, 437-441., Normal uterine size in women of reproductive age in northern Islamic Republic of Iran. Eastern Mediterranean Health Journal 2004 May; 10(3):437-41. doi.org/10.26719/2004.10.3.437

[15] Umar UM, Isyaku K, Adamu YM, Abubakar S, Kabo N, Nura I, et al. Sonographic measurement of uterine dimensions in healthy nulliparous adults in Northwestern Nigeria. 2017 Jan; 20(1):1.

[16] Turocy JM, Rackow BW, editors. Uterine factor in recurrent pregnancy loss. Seminars in Perinatology; 2019 Mar;43(2):74-79. doi: 10.1053/j.semperi.2018.12.003.

[17] Al Naimi A, Wolnicki B, Mouzakiti N, Reinbach T, Louwen F, Bahlmann FJAog, et al. Anatomy of the sonographic post-caesarean uterus. 2021;304(6): 1485-1495. Archives of Gynecology and Obstetrics. 2021 Dec; 304(6):1485-1495. doi: 10.1007/s00404-021-06074-y.

[18] Kaelin Agten A, Honart A, Monteagudo A, McClelland S, Basheer B, Timor-Tritsch IEJJoUiM. Cesarean delivery changes the natural position of the uterus on transvaginal ultrasonography. Journal of Ultrasound in Medicine 2018 May; 37(5):1179-1183. doi: 10.1002/jum.14461.

[19] Gothwal M, Singh P, Bharti JN, Yadav G, Solanki VJJIoA, Research BM. Giant cervical angiomomatous polyp masquerading third-degree uterine prolapse: A rare case with review of literature. International journal of applied and basic medical research 2019 Dec; 9(4):256-258. doi: 10.4103/ijabmr.IJABMR._386_18.

[20] Liao W-L, Ying T-H, Shen H-P, Wu P-JJJJoO, Gynecology. Combined treatment for big submucosal myoma with High Intensity Focused Ultrasound and hysteroscopic resection. Taiwanese Journal of Obstetrics and Gynecology 2019 Nov; 58(6):888-890. doi: 10.1016/j.tjog.2019.04.001.

[21] Slavchev S, Kostov S, Yordanov AJM. Pregnancy and childhood in uterus didelphys: a report of three cases. Medicina (Kaunas). 2020 Apr; 56(4):198. doi: 10.3390/medicina56040198

[22] Liu X, Xue L, Wang Y, Wang W, Tang JJJJoH. Vaginal delivery outcomes of pregnancies following ultrasound-guided high-intensity focused ultrasound ablation treatment for uterine fibroids. International Journal of Hyperthermia. 2018; 35(1):510-517. doi: 10.1080/02656736.2018.1510548.

[23] Poudel R, Stanley JL, Rueda-Clausen CF, Andersson IJ, Sibley CP, Davidge ST, et al. Effects of resveratrol in pregnancy using murine models with reduced blood supply to the uterus. PLoS One. 2013 May; 8(5):e64401. doi:10.1371/journal.pone.0064401.

[24] Maleux G, Timmerman D, Heye S, Wilms GJEr. Acquired uterine vascular malformations: radiological and clinical outcome after transcatheter embolotherapy. European Radiology 2006 Feb; 16(2):299-306. doi:10.1007/s00330-005-2799-5.

[25] Palijuyle V, Drasutiene G, Ramasauksaite D, Bartkeviciene D, Zakareviciene J, Kurmanavicius JJJO, et al. Physiological Uterine Involution in Primiparous and Multiparous Women: Ultrasound Study. International journal of Obstetrics and Gynecology 2017; 2017:6739345. doi: 10.1155/2017/6739345.

[26] Ahmed SO. Evaluation of Parity Relation with Uterus Size using ultrasonography (Doctoral dissertation, Sudan University of Science & Technology). 2017