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RESEARCH ARTICLE

SONOGRAPHIC EVALUATION OF UTERUS SIZE IN RELATION TO MATERNAL PARITY AND CAESAREAN SECTION DELIVERY

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ABSTRACT

Objective: To assess the uterine size in relation to the parity and caesarean section delivery as revealed by transabdominal ultrasound.
Methods: This was a cross-sectional study in which 50 women with vaginal delivery and caesarean section deliveries were examined by transabdominal sonography. The uterus was assessed by measuring the length, anteroposterior and transverse diameter of the uterus. Morphologic findings were recorded. The effect of the parity, number of caesarean sections on the uterine size were evaluated. The gynaecological symptoms were also recorded.
Results: The maximum dimensions of the uterus in length, anteroposterior and transverse diameter was 11.5cm, 5.6cm and 4.8cm respectively in a multiparous women (parity -3) who had undergone one vaginal and two caesarean section deliveries. The minimum dimensions of the uterus in length, anteroposterior and transverse diameter was 7.6cm, 3.5cm and 3.3cm respectively in a multiparous women (parity -2)who had who had undergone one vaginal and one caesarean section delivery. Most often uterus position was anteverted. Positive correlation was seen between the length of the uterus and the parity status. There is no significant correlation in between the length of the uterus and post caesarean. However the maximum size of the uterus obtained in this study was seen in case of multiparous (Parity 3) women with two caesarean deliveries who had no gynaecological symptoms.
Conclusions: The size of the uterus in a multiparous woman as assessed by transabdominal sonography revealed significant increase in the size with increasing parity. The multiparous women with multiple caesarean section deliveries woman who had developed bulkiness of the uterus had no gynaecological symptoms. This bulkiness of the uterus in multiparous women who had undergone multiple caesarean deliveries with no gynaecological symptoms is to be considered normal and hysterectomy should be avoided in these cases.

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INTRODUCTION

Since its introduction into obstetric practice ultrasound has made non-invasive investigation of the uterus possible. Ultrasonographic measurement of uterus size is valuable for predicting pathologies associated with abnormal uterine size. The transabdominal ultrasound when performed with full bladder gives a wider field of view. Caesarean section (Sectio Caesarea) is a surgical method for the completion of delivery where the horizontal incision is placed in the lower segment of the gravid uterus (Shewli Shabnam, 2007) Over years the number of caesarean section deliveries have increased. In India the rate of caesarean section delivery has increased from 3 per cent to 10 per cent between 1992-93 and 2005-06 (IIPS, 2007) (Bertollini, 1992). Our aim was to evaluate the effect of the parity and the caesarean section delivery on the size of the uterus and whether the bulkiness of the uterus caused any gynaecological symptoms.

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MATERIALS AND METHODS

Inclusion criteria: 50 women in the age group of 20-35 years who had undergone vaginal and caesarean section deliveries were included in the study. Informed consent was obtained from all women prior to the patient evaluation. Exclusion criteria: The parous women with focal and diffuse myometrium and endometrial lesion and adnexal pathologies were excluded from the study. Transabdominal

ultrasonography was performed in all the patients on full bladder using 3.5-MHz transabdominal convex probe in the Voluson S6 Pro GE Sonography machine. The length, anteroposterior and transverse dimensions of the uterus were recorded in all cases. The quantitative variables were analyzed utilizing the IBM SSPS statistical package (Version 3.2). Comparison between variables was carried out using Pearson's correlation coefficient.

women had undergone two caesarean deliveries and one lady had three caesarean deliveries. None of the subjects had trial of vaginal birth after caesarean section. The maximum dimensions of the uterus in length, anteroposterior and transverse diameter was 11.5cm, 5.6cm and 4.8cm respectively in a multiparous women (parity 3)who had undergone one vaginal and two caesarean section deliveries.

Table 1. Total number of cases – 50

Parity	*Length (mm)*	*Transverse diameter (mm)*	*AP diameter (mm)*	*LSCS*
1	7.4	5.0	4.4	1
1	8.2	4.8	3.6	1
2	8.6	5.5	4.2	2
1	8.1	4.1	3.6	1
1	7.8	4.1	3.9	1
2	8.9	5.7	4.8	2
2	9.1	5.8	4.8	1
2	9.0	5.4	4.3	2
2	9.2	5.0	4.3	1
3	9.5	5.0	3.7	1
1	8.4	5.0	3.8	1
1	7.5	5.0	3.8	1
2	9.2	5.4	3.1	1
2	8.1	5.5	4.2	2
2	8.6	5.0	4.0	1
1	10.0	6.0	4.5	1
2	11.3	5.5	3.9	1
3	11.4	4.3	3.7	2
2	8.9	4.9	4.7	2
3	9.9	6.6	3.5	2
2	7.0	4.7	3.3	1
1	6.8	4.9	3.7	1
2	8.9	6.8	2.3	1
3	10.5	5.2	4.1	1
2	9.1	5.8	4.5	2
2	10.8	5.7	4.3	2
2	10.0	5.7	4.8	1
2	9.7	5.9	4.0	1
2	10.0	5.7	2.7	1
2	9.8	4.2	4.2	2
1	9.6	4.9	4.3	2
2	9.7	5.9	3.7	1
2	8.8	4.9	4.8	2
1	6.0	3.8	4.5	2
2	8.7	4.7	4.0	1
2	8.3	4.4	2.6	2
1	7.6	4.7	3.8	2
1	8.2	5.9	4.0	1
1	7.8	5.6	4.2	1
3	11.5	5.6	4.8	1
2	9.9	5.5	4.8	3
1	7.0	3.5	3.0	2
1	8.1	4.5	3.1	1
3	11.1	6.7	4.9	1
2	9.1	5.5	4.5	2
2	9.2	5.1	4.0	1
1	8.1	4.5	3.9	2
2	9.6	5.3	4.7	1
2	9.1	5.2	4.2	2
2	9.5	5.5	4.3	1
Mean	**8.9**	**5.2**	**3.9**	

Table 2. Correlations

		Length	Parity
Length	Pearson Correlation	1	.7114**
	Sig. (2-tailed)		.000
	N	50	50
Parity	Pearson Correlation	.7114**	1
	Sig. (2-tailed)	.000	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

RESULTS

Twenty women were primiparous and thirty were multiparous. Thirty women had undergone one caesarean section, nineteen

The minimum dimensions of the uterus in length, anteroposterior and transverse diameter was 7.6cm, 3.5cm and 3.3cm respectively in a multiparous women (parity 2)who had who had undergone one vaginal and one caesarean section

delivery. The mean length of the uterus was 8.9cm, the mean transverse diameter of the uterus was 5.2cm and the mean anteroposterior diameter of the uterus was 3.9cm. In all subject uterus was anteverted in position. There was significant positive correlation (Pearson's correlation coefficient - 0.7114 and p value <0.01) with between the parity (including in vaginal and caesarean section deliveries) and length of the uterus. There was no significant correlation of the other dimensions of the uterus (anteroposterior and transverse diameters) with the parity. Also the maximum size of the uterus observed as mentioned above was seen in multiparous woman who had undergone two caesarean section deliveries and had no gynaecological symptoms.

DISCUSSION

The uterus consists of two parts, the body and the cervix which is the lowest cylindrical portion that projects into the vagina .The size of the uterus is variable. In adults of reproductive age, the uterus measures approximately 6 to 8.5cm in length in nulliparous women and 8 to 10.5cm in length in multiparous women. The transverse diameter of the uterus measures approximately 3 to 5 cm in nulliparous woman and 4- 6 cm in multipara. The anteroposterior diameter is 2 to 3.3cm in nulliparous woman and 3 to 5 in the multipara (Benacerraf, 2008). Difference in uterine size between premenopausal women with one or more deliveries and nulliparous was consistent (Piiroinen, 1975). Uterus size in adulthood is significantly associated with parity and that within the same parity group of women there is no age-related effect on uterine size (Piiroinen, 1975). In the premenopausal group, a parity-related enlargement in uterine size is observed between nulliparous and parous women. Parity (pregnancy) increases the normal size by more than 1 cm in each dimension (Platt, 1990; Merz *et al*., 1996 and Miller *et al*., 1977). Merz *et al* (Merz, 1996) also found a significant difference in uterine length between primiparas and multiparas, with an increase of approximately 1 cm in primiparas and 2 cm in multiparas. Caesarean delivery is the most commonly performed major abdominal operation in women (Shuchi *et al*., 2012). Caesarean section is a surgical intervention which is carried out to ensure safety of mother and child when vaginal delivery is not possible (emergency CS) or when the doctors consider that the danger to the mother and baby would be greater with a vaginal delivery (planned CS).Caesarean section involves an incision made in the lower uterine segment or isthmus (Hofmeyr, 2009). In our study there was significant positive correlation between the parity (including in vaginal and caesarean section deliveries) and length of the uterus. Also the maximum size of the uterus observed as mentioned above was seen in multiparous woman who had undergone two caesarean section deliveries and had no gynaecological symptoms.

Conclusion

The size of the uterus in a multiparous woman as assessed by transabdominal sonography revealed significant increase in the size with increasing parity. The multiparous women with multiple caesarean section deliveries woman who had developed bulkiness of the uterus had no gynaecological symptoms. This bulkiness of the uterus in multiparous women who had undergone multiple caesarean deliveries with no gynaecological symptoms is to be considered normal and hysterectomy should be avoided in these cases.

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