

ORIGINAL ARTICLE

OUTCOME OF PREGNANCY WITH CLINICALLY VISIBLE/PALPABLE MYOMA AMONG WOMEN WHO UNDERGO CAESARIAN SECTION IN THREE TEACHING HOSPITALS, ADDIS ABABA, ETHIOPIA: A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: Myoma is the most common pelvic tumor and an enormous healthcare concern in women. Complications occur in approximately 10-40% of pregnancies with myomatous uterus. This study is conducted to determine the prevalence and obstetric outcome of grossly visible and/or palpable myoma among women who gave birth by caesarean section.

Methods: A cross sectional study conducted in three teaching hospitals in Addis Ababa, Ethiopia. Data was collected using a pre-tested questioner.

Results: A total of 404 cases were included in the study. The prevalence of myoma was 15.3% (62/404). Only 9.7% (6/62) of the myoma cases were diagnosed preoperatively with ultrasound. The number of myoma per case ranged from 1-to-14 with mean number of 3 ±2.7. The mean diameter of largest single myoma per case was 5.2cm ± 3.4. The commonest location of myoma was subserous being the location in 58.1% (36/62). There was significant association between presence of myoma and age of the woman ($P<0.05$). The adjusted prevalence of myoma increases as women's age increases, and gestational age and birth weight decreases. In addition, the prevalence of myoma was about two times higher in low (≤ 6) first and fifth minute APGAR score groups with adjusted prevalences of 22.2% (Vs 14.1% in ≥ 7 group) and 31.8% (Vs 14.4% in ≥ 7 group) respectively.

Conclusions: The prevalence of myoma during pregnancy in this study is higher than prior reports from similar setups. But, no statistically significant association was observed between the presence of myoma and maternal outcome.

Key words: Myoma, Leiomyoma, Fibroid, Pregnancy with Myoma.

INTRODUCTION

Myoma of the uterus, also called uterine leiomyoma or fibroid, is the most common reproductive tract tumor and an enormous healthcare concern in women (1,2). Its pathogenesis is not well understood. Although the initiator or initiators of fibroids are unknown, estrogen and progesterone are widely considered as promoters of fibroid growth (2). Risk factors include nulliparity, obesity, family history, black race, and hypertension (1,2).

The reported prevalence of uterine myoma in women ranges from 5.4 to 77 percent, depending on the population studied and the diagnostic method used (1). Many studies have shown that the incidence gen-

erally increases as age increases. The prevalence of ultrasound-identified tumors ranges from 4 percent in women 20 to 30 years of age to 11 to 18 percent in women 30 to 40 years of age and 33 percent in women 40 to 60 years of age (1). The prevalence in pregnancy varies between 1.6 and 12.3 percent depending on the trimester of assessment, the size threshold, the population studied and the diagnostic method used (3-5).

Majority of myomas are small and asymptomatic while clinically apparent ones are suspected based on presenting symptoms and signs (6). During pregnancy, however, the diagnosis is widely believed to be not simple. Prior studies have shown that only 42% of large fibroids (> 5cm) and 12.5% of smaller fibroids (3-5 cm) can be diagnosed on physical ex-

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amination (7). The ability of ultrasound to detect fibroids in pregnancy is shown to be even more limited (1.4%–2.7%) primarily due to the difficulty of differentiating fibroids from physiologic thickening of the myometrium. The prevalence of uterine fibroids during pregnancy is therefore likely underestimated (8).

The potential effects of these tumours on pregnancy and the potential effects of pregnancy on the tumours are frequent clinical concerns (9). Complications were seen to occur in approximately 10-40% of pregnancies in the presence of fibroids (9,10). Their presence has been linked to spontaneous abortion, premature labour, soft tissue dystocia, uterine inertia, foetopelvic disproportion, malposition of the foetus, retention of the placenta, postpartum haemorrhage, pain, degeneration, placental abruption, intra uterine growth restriction (IUGR) (11,12). The complications are more likely to occur in women with large myoma (>5 cm) compared to women with no myoma or small myoma (≤ 5 cm) (12).

Although myoma is a benign disease it is associated with significant obstetric complications and also affects health of a woman (2-10). Not much, however, is known about the true prevalence of fibroids in low-resource settings including Ethiopia (13). There is no published data on the prevalence and outcome of myoma in Ethiopian set up. This study, hence, was designed primarily to give baseline information on the prevalence and obstetric outcome of grossly visible and/or palpable myoma among woman who give birth by caesarean section.

PATIENTS AND METHODS

This is a hospital based cross sectional study. It was done from April 1, 2014 GC to June 31, 2014 GC at three teaching Hospitals in Addis Ababa, Ethiopia; namely Tikur Anbesa Specialized Hospital (TASH), Gandhi Memorial Hospital (GMH) and Zewditu Memorial Hospital (ZMH). All women who delivered by Cesarean section (C/S) for any indication in the three study hospitals during the study period were included. A structured, pre-tested questionnaire was used to collect data from 404 eligible mothers on independent variables (socio-demographic and obstetric variables) and the dependent variable (presence of myoma).

Data was collected by the investigator and attending surgeons. All potential surgeons in the three hospitals were informed to specifically check for the presence of myoma during the C/S and oriented on the data collection process.

Data was entered, cleaned and analyzed using SPSS version 21 statistical software. Descriptive statistics such as proportions, percentages, ratios and frequency distributions in addition to measures of central tendency and dispersion were used for summarizing and presenting data. Bivariate regression analysis was then employed to test for association between all independent variables and the dependent variable (presence of myoma). Variables having p value ≤ 0.2 in the bivariate analyses were entered into a multiple logistic regression model to control the confounding effect amongst the variables. Odds ratio with their 95% confidence intervals were computed to identify the presence and strength of association, and statistical significance was declared if $p < 0.05$.

Ethical clearance was obtained from the research and publication committee (RPC) of the department of Obstetrics & Gynecology, Addis Ababa University (AAU). Formal permission was also obtained from each of the study Hospitals to cascade the research and access the medical records of mothers included in the study. Written consent was also obtained from each pregnant women included in the study.

RESULTS

A total of 404 women who underwent C/S and consented to participate were included in this study. The age of the study participants ranged from 15 to 43 years while the mean and median ages were 28.05 ± 4.95 and 27.0 years respectively. As depicted in table 1, majority of the mothers, 71.1% (287/404), were in the age group of 21-30 years. Orthodox Christianity and Amhara were the commonest forms of religion and ethnicity with prevalences of 67.6% (273/404) and 42.8% (173/404) respectively. Nearly all, 95% (384/404), were married while 55.2% (223/404) were housewives. patients.

Table 1: Socio demographic characteristics of the study participant women who undergo caesarian section in three teaching hospitals, Addis Ababa, Ethiopia.

Characteristics		Frequency	Percentage (n=404)
Age	≤ 20	17	4.2
	21-25	121	30.0
	26-30	166	41.1
	31-35	66	16.3
	36-40	30	7.4
	>40	4	1.0
Marital Status	Married	384	95
	Single	14	3.5
	Divorced	6	1.5
Occupation	House Wife	223	55.2
	Employed	166	41.1
	Self Employed	7	1.7
	Others	8	2.0
Ethnicity	Amhara	173	42.8
	Oromo	126	31.2
	Gurage	75	18.6
	Tigre	11	2.7
	Others	19	2.9
Religion	Orthodox Christian	273	67.6
	Muslim	82	20.3
	Protestant Christian	45	11.1
	Others	4	1.0

The mean gravidity, parity and abortion before delivery were 2.16 ± 1.41 , 0.85 ± 1.22 and 0.31 ± 0.66 respectively. The mode (and total number of cases at the mode value) of gravidity, parity and abortion were 1 (157), 0 (204), 0 (311) respectively. The majority of the C/S cases, 82.9% (335/404), were done on an emergency basis. As shown in Table -2, Non Reassuring Fetal Heart Beat (NRFHB) was the commonest indication for cesarean delivery followed by previous C/S scar each accounting for 23.3% (94/404) and 18.6% (75/404) respectively. Nearly half of the C/S procedures, 53% (214/404), were done at 37+1-42 weeks of gestation while the diagnosis of ante partum hemorrhage (APH) was made in 7.7 % (31/404) of cases, shown in Table 2. The mean birth weight, preoperative hematocrit (hct) and post-operative hct values were $2,896.2 \pm 667.8$ grams, 38.6 $\pm 3.5\%$ and 35.0 $\pm 4.3\%$ respectively. The mean esti-

mated blood loss as estimated by the attending surgeon was 420.3 ± 174.2 ml.

The prevalence of myoma in this study, as observed or palpated intraoperatively, was 15.3% (62/404). There was no data on the number of participants who had pre-operative diagnostic ultrasound scanning. As shown in Table-3 only 9.7% (6/62) of the myoma cases were diagnosed preoperatively with ultrasound while the rest, 90.3% (56/62), were diagnosed intraoperatively. The number of myomas per case ranged from 1-to-14 with mean number of myomas of 3 ± 2.7 . The diameter of largest single myoma found per case ranged from 1-to-25cms while the mean diameter was 5.2 ± 3.4 cms. The commonest location of myomas was subserous being the location in 58.1% (36/62) of cases (Table -3).

Table -2: Obstetric characteristics among women with and without myoma who undergo caesarian section in three teaching hospitals, Addis Ababa, Ethiopia.

Characteristics	Frequency	Percentage (n=404)
Gravidity		
1	157	38.9
2-5	234	57.9
>5	13	3.2
Parity		
≤ 1	325	80.4
2 - 5	75	18.6
> 5	4	1.0
Gestational Age (GA)		
28-34 weeks	19	4.7
34+1-37	33	8.2
37+1-42	214	53.0
≥42	43	10.6
Unknown Last Normal Menstrual Period (LNMP)	95	23.5
Indication for C/S		
NRFHB	94	23.3
Previous C/S	75	18.6
Cephalo-Pelvic Disproportion (CPD)	40	9.9
Malpresentation	40	9.9
Active phase disorders	32	7.9
Twin pregnancy	27	6.7
Others	96	23.8
Birth weight (gms)		
1000-1499	9	2.2
1500-2499	62	15.3
2500-3999	312	77.2
≥4000	21	5.2
APGAR Score		
First Minute		
≤6	63	15.6
≥7	341	84.4
Fifth minute		
≤6	22	5.4
≥7	382	94.6
Estimated Blood Loss (EBL) in ml		
<500	344	85.1
500-1000	56	13.9
>1000	4	1.0
Ante Partum Hemorrhage (APH)		
No	373	92.3
Yes	31	7.7

Table -3: Characteristics of Myoma among Women with Wyoma who undergo Caesarian section in Three Teaching Hospitals, Addis Ababa, Ethiopia.

Characteristics	Frequency	Percentage (n=62)
Diagnosed preoperatively with ultrasound		
Yes	6	9.7
No	56	90.3
Location of myoma during C/S		
Subserous	36	58.1
Intramural	11	17.7
Combination	15	24.2
Number of myoma per case		
1-5	56	90.3
6-10	4	6.5
>10	2	3.2
Diameter of largest single myoma found per case (cms)		
1-5	39	62.9
6-10	22	35.5
>10	1	1.6

To evaluate factors associated with the presence of myoma sociodemographic characteristics (age, marital status, occupation, ethnicity and religion) and obstetric characteristics (gravidity, parity, Gestational Age (GA), indication for C/S, birth weight, 1st and 5th minute APGAR scores, estimated blood loss, pre-operative and postoperative haematocrit levels and presence of APH) were tested for association. However, only six variables (age, gestational age, birth weight, 1st and 5th minute APGAR scores and presence of APH) had significant association with the presence of myoma ($P < 0.2$) in bivariate analysis while the association was lost in all but age in multivariate analysis ($P < 0.05$).

As depicted in Table 4, there was significant association between presence of myoma and age of the woman ($P < 0.05$). The adjusted prevalence of myoma significantly increases with increased age. The chance of having myoma was about four times less in women of ≤ 25 Years of age compared to those of

>36 years of age (AOR 0.26; 95% CI 0.095-0.692). In contrast, the prevalence of myoma generally decreases as Gestational Age (GA) increases although not significant ($P > 0.05$). The chance of having myoma was two times higher in both first and fifth minute APGAR score groups of ≤ 6 with adjusted prevalences of 22.2% (Vs 14.1% in ≥ 7 group) and 31.8% (Vs 14.4% in ≥ 7 group) respectively ($P < 0.2$). The observed association between presence of myoma and fifth minute APGAR score ($P < 0.05$) was significant in bivariate analysis but the association was lost in the multivariate regression analysis (COR 2.78; 95% CI 1.082-7.114 Vs AOR 2.25; 95% CI 0.596-8.469). The adjusted prevalence also revealed that myoma was slightly more common in mothers who had history of ante partum hemorrhage (APH) and birth weight range of 1,000-1,499 grams with adjusted prevalences of 44.4% (4/9) and 25.8% (8/31) but the association was not significant ($P > 0.05$).

Table 4: Adjusted Distribution and Analysis of selected Parameters for Association with presence of Myoma on Women who underwent C/S at Three Teaching Hospitals, A.A, Ethiopia.

Characteristics	№ of women		Adjusted prevalence of myoma (%)	P-value	OR for presence of myoma	
	With myoma	Without myoma			COR (95% CI)	AOR (95% CI)
Age				0.026**		
≤ 25	16	122	11.6		0.27 (0.113-0.666)	0.26 (0.095-0.692)
26-30	24	142	14.5		0.35 (0.153-0.817)	0.33 (0.127-0.845)
31-35	11	55	16.7		0.42 (0.159-1.100)	0.37 (0.124-1.097)
>36	11	23	32.4		1	1
Gestational age (weeks)				0.138*		
Unknown LNMP	12	83	12.6		0.74 (0.271-2.043)	0.62 (0.203-1.919)
28-34	6	13	31.6		2.37 (0.672-8.380)	1.23 (0.249-6.047)
34+1-37	8	25	24.2		1.65 (0.529-5.123)	1.33 (0.362-4.847)
37+1-42	29	185	13.6		0.81 (0.328-1.981)	0.74 (0.278-1.980)
>42	7	36	16.3		1	1
APGAR Score						
First Minute - ≤6	14	49	22.2	0.099*	1.74 (0.894-3.401)	1.18 (0.463-3.025)
- ≥7	48	293	14.1		1	1
Fifth Minute - ≤6	7	15	31.8	0.027**	2.78 (1.082-7.114)	2.25 (0.596-8.469)
- ≥7	55	327	14.4		1	1
Birth Weight				0.089*		
1000-1499	4	5	44.4		4.8 (0.797-28.898)	4.25 (0.531-33.922)
1500-2499	11	51	17.7		1.3 (0.324-5.170)	0.98 (0.213-4.550)
2500-3999	44	268	14.1		0.99 (0.279-3.484)	0.80 (0.202-3.176)
≥4000	3	18	14.3		1	1
APH				0.093*		
No	54	319	14.5		0.49 (0.207-1.144)	0.54 (0.209-1.400)
Yes	8	23	25.8		1	1

*P-value <0.2, **P-value <0.05

DISCUSSION

Myoma (or fibroid) in pregnancy is common in clinical obstetric practice. Estimates of the prevalence of myoma in pregnancy vary depending on the method of diagnosis and, the race and age of the women being studied. While physical examination typically can identify the presence of larger fibroids, ultrasonography has evolved as the standard tool to evaluate the uterus for fibroids. In this study, however, diagnosis of myoma to estimate its prevalence was based on surgical findings during cesarean deliveries. This approach, used in older studies, likely has much better sensitivity than physical examination and ultrasound to detect myoma in pregnancy primarily due to the difficulty of differentiating myoma from physiologic thickening of the myometrium (8).

The prevalence of myoma in this study (15.3%) was high compared to many other prior studies both in developed and developing countries. It is about ten times higher than reported prevalences of 1.6, 1.5 and 1.4 % from ultrasound based studies done in Italy, Los Angeles and Rhode Island respectively (5, 14, 15, 16). The prevalence in this study is still much higher than rates of myoma reported for black populations in many studies where myoma is typically found to be two- to three-fold greater in black women than in white women (17). It is, however, not substantially higher than that observed in an ultrasound based study in second trimester of Nigerian women (12.3%) (5). This difference in prevalence could be due to differences in study methodology.

The association between age of woman and myoma in this study is in agreement with most prior studies (14). The adjusted prevalence of myoma significantly increases as age of women increases. Similarly, myoma prevalence was associated with GA at C/S, APGAR scores, and birth weight, in agreement with prior reports and evidences, though in our study these associations did not reach statistical significance. The highest prevalence of myoma was seen in GA group of 28-34 weeks and birth weight group of 1000-1500 gm with prevalences of 31.6% and 44% respectively, though the numbers of cases in these groups were small. This could be due to myoma contributing to early delivery and hence low birth weight.

No trend or statistically significant association between presence of myoma and maternal outcomes including ante partum hemorrhage, estimated blood loss during surgery, and pre and post operative hematocrit were observed in this study. This could be explained by the fact that majority of myoma in our study subjects were subserous in location and smaller in size. As reported in prior studies, poor obstetric outcome and impaired fertility are observed in those women who have submucous and intra mural myoma with distortion of endometrial cavity (18,19).

Most prior reports indicated that increased parity decreases the incidence and number of clinically apparent myomas (20). In this study, however, statistically significant association was not observed between presence of myoma and either gravidity or parity. This could be due to the younger age of our study participants where 65 % were younger than 30 years of age which is associated with much lower risk of developing myoma.

Limitations: The main limitation of this study was that it evaluated women undergoing cesarean section, and hence cannot ascertain the impact on pregnancy outcomes of myomas identified during the first and second trimesters.

Conclusions: In conclusion, the prevalence of myoma during pregnancy in this study is surprisingly higher than prior reports from similar setups. We suggest that this is related to the greater sensitivity of intraoperative identification during C/S rather than pre-delivery ultrasound. In agreement with prior evidences, a statistically significant association was observed between myoma and age of the women. Although not statistically significant, presence of myoma was associated with lower birth weight and APGAR scores. No significant association was observed between presence of myoma and maternal outcome.

Recommendations: Awareness needs to be fostered among the health care providers to timely identify pregnant women with myoma during antenatal care and plan appropriate management to improve perinatal outcome. In addition, further studies including evaluation for myoma during first and second trimesters of pregnancy are needed to obtain a more representative estimate of myoma prevalence during pregnancy.

REFERENCES

1. Patricia E. and Susan P: Uterine Fibroid Tumors: Diagnosis and Treatment, *American Family Physician*, 2007;75(10)
2. Flake et al: Etiology and Pathogenesis of Uterine Leiomyomas: A Review, *Environmental Health Perspectives*, 2003; 111(8)
3. Qidwai GI, Caughey AB, Jacoby AF. Obstetric outcomes in women with sonographically identified uterine leiomyomata. *Obstet Gynecol* 2006; 107:376.
4. Laughlin SK, Baird DD, Savitz DA, et al. Prevalence of uterine leiomyomas in the first trimester of pregnancy: an ultrasound-screening study. *Obstet Gynecol* 2009; 113:630.
5. Eze C. et al: Sonographic assessment of pregnancy co-existing with uterine leiomyoma in Owerri, Nigeria, *African Health Sciences*, 2013; 13(2):453–60
6. Fraser IS, Critchley HO, Munro MG, et al. A process designed to lead to international agreement on terminologies and definitions used to describe abnormalities of menstrual bleeding. *Fertil Steril* 2007; 87:466.
7. Muram D, Gillieson M, Walters JH. Myomas of the uterus in pregnancy: ultrasonographic follow-up. *Am J Obstet Gynecol*. 1980; 138:16–19.
8. Cooper NP, Okolo S. Fibroids in pregnancy common but poorly understood. *Obstet Gynecol Surv*.2005; 60:132–38.
9. Ouyang DW, Economy KE, Norwitz ER. Obstetric complications of fibroids. *Obstet Gynecol Clin North Am*. 2006; 33:153–69. [PubMed]
10. Exacoustòs C, Rosati P. Ultrasound Diagnosis of Uterine Myomas and Complications in Pregnancy. *Obstet Gynecol*. 1993; 82:97–101. [PubMed]
11. Shehla N.et al: pregnancy with fibroids and is obstetric complications, *J Ayub Med Coll Abbottabad* 2009; 21 (4)
12. Valerie I. et al: Adverse obstetric outcomes associated with sonographically identified large uterine fibroids, *American Society for Reproductive Medicine*, 2012; 97(1)
13. Regine Unkels. *A Textbook of Gynecology for Less-Resourced Locations*. Heleen van Beekhuizen, Regine Unkels (eds). Sapiens Publishing 2012, pp 212-28.
14. William H. et al: Etiology, symptomatology, and diagnosis of uterine Myomas, *American Society for Reproductive Medicine*, 2007; 87(4)
15. Gary N. and Marcus W. Myomas and myomectomy, *Journal of Minimally Invasive Gynecology*, 2005; 12(5)
16. Strobelt N, Ghidini A, Cavallone M, et al. Natural history of uterine leiomyomas in pregnancy. *J Ultrasound Med* 1994; 13:399.
17. Baird DD, Dunson DB, Hill MC, et al. High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. *Am J Obstet Gynecol* 2003; 188:100.
18. Elizabeth A.: Fibroids and infertility: an updated systematic review of the evidence *American Society for Reproductive Medicine* 2009:19(4)
19. Fla´vio G.: Impact of subserosal and intramural uterine fibroids that do not distort the endometrial cavity on the outcome of invitro fertilization–intracytoplasmic sperm injection *European Society of Human Reproduction and Embryology*, 2004:81(1)
20. Parazzini F, Negri E, La Vecchia C, Chatenoud L, Ricci E, Guarnerio P. Reproductive factors and risk of uterine fibroids. *Epidemiology* 1996;7: 440–2.