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Research Article

Assessment of Certainty of Gestational Age and its Associated Factors among Pregnant Mothers Admitted to Jimma Medical Center for Delivery; A Comparative Cross Sectional Study

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Abstract

Background: Certainty of gestational age (GA) is very crucial in proper management of every pregnancy. It is one of the most common problems facing the clinician every day in practice. In patients where the last menstrual period is unknown, a lot of effort is made to acquire information for determining the duration of pregnancy and certainty of GA by using different methods including ultrasound. Usually uncertain GA was significantly related to adverse pregnancy outcomes such as perinatal mortality, low birth weight, and spontaneous preterm delivery.

Objective: The present study aimed to assess certainty of gestational age and its associated factors among pregnant mothers admitted to Jimma Medical Center (JMC) for delivery.

Methods: Hospital based comparative cross sectional study was conducted among pregnant mothers admitted to JMC for delivery from March 1/2019 to May 31/2019. The total of 418 samples was recruited by systematic random sampling technique. Data was collected using a structured questionnaire and entered into Epidata version 4.3.1 and finally exported to SPSS version 20 for further analysis. Certainty of GA was determined based on different criteria (unknown LMP, contraceptive use, irregular cycle, prolonged cycle, lactational amenorrhea and early pregnancy bleeding). Mothers who had any of the mentioned above criteria were considered as uncertain GA. Cross tabs and logistic regression were applied to determine the association of outcome variable to predictor variables with specific AOR, 95% CI and p-value less than 0.05 was considered as statistically significant. The result of the study was presented by using tables, charts and narration.

Results: The mean age was 25.67±5.01 that ranges from 14-40 years and there was no mean difference of age between groups (mothers with certain and uncertain GA). About 218 (52.2%) of the study subjects were living in urban area while the rest 200 (47.8%) were from rural. The proportion of uncertain gestation was 64.1% while the remaining 35.9% belongs to certain GA. Unknown LMP was a major contributory factor(86.9%) for uncertain GA. The other responsible factor for uncertain GA was contraceptive use (34.7%), irregular cycle (19%), prolonged cycle (2.2%), lactational amenorrhea (2.2%) and early pregnancy bleeding (2.2%). Finally, three predictors [educational status (no formal education), time of U/S scanning (not done) and mode of delivery (emergency C/S) were identified to accompanying with uncertain GA with specific AOR, 95% CI of 3.24 (0.96-10.73) p-value 0.04; 5.86 (1.05-34.43) p-value 0.04; and 2.65 (1.41-4.95) P- value <0.000 respectively.

Conclusion and Recommendation: Uncertain GA was also observed to have strong association with adverse pregnancy outcomes. Thus, health education about ANC follow up and related service utilization promotion needs due emphasis especially among rural mothers as it is the corner stone of certainty of GA.

Keywords: *Certainty of Gestation, Pregnant mothers, Associated factors, Jimma, Ethiopia*

Introduction

Uncertain gestation is a pregnancy by which the gestational age (GA) calculation is uncertain by the traditional clinical methods. The clinical estimate of GA typically relies on clinical history (menstrual cycle length, regularity, and recall of the first day of the last menstrual period), followed by confirmation by physical examination or other signs and symptoms [1].

Uncertain GA is one of the most common problems facing the clinician every day in practice. The incidence of uncertain GA is not less than 22% in patients attending antenatal clinics in developed countries[2]. Survey of British births in 1970 revealed the proportion of uncertain GA to be 17% [3,4]. The incidence of unreliablemenstrual history was 24.9% – 44.7% as one main criteria to determine uncertain GA [5,6].

The extent and genesis of uncertainty of gestation has been studied in a total obstetric population, and the burden of uncertain GA varies in different countries as it affected by different factors and estimated to be 7.1% [7]. A study done by the Swiss Precision Diagnostics revealed that 50% of women were unable to recall their LMP and considered to be uncertain GA[8]. 10 to 40% of pregnant women have no knowledge, have irregular history of menstrual cycle or have been on oral contraception which distorts menstrual cycle as the diagnostic criteria of uncertain GA [9].

Uncertain GA was significantly related to adverse pregnancy outcomes such as perinatal mortality, low birth weight, and spontaneous preterm delivery as the independent of unfavorable maternal characteristics[10]. A high incidence of low birth weight babies was associated with uncertain gestation in comparison with pregnant mothers with certain GA[11]. There was also high rates of operative deliveries among mothers with uncertain gestation as well as increased neonatal mortality ($P < 0.005$) [12].The uncertain GA was also associated with increased rate of emergency caesarean section[13].

There were few studies done in developing countries, including Ethiopia on the incidence of uncertain gestation and its correlation with pregnancy outcome and associated factors. Thus, the present study was aimed to assess certainty of gestational age and its associated factors among pregnant mothers admitted to Jimma Medical Center (JMC) for delivery.

Methods

The study was conducted at JMC which is one of the oldest public hospitals in the country located in Jimma town, Oromia regional state, Ethiopia. Currently it is the only teaching and referral hospital in the southwestern part of the country, providing services for approximately 15,000 inpatient, 160,000 outpatient attendants, 11,000 emergency cases and 4500 deliveries in a year that serve the catchment population of about 15 million people. The average number of hospital deliveries per month is more than 400. Labor and delivery ward have 11 first stage beds and five second stage delivery couches. The study was conducted from March 1/2019 to May 31/2019 with a comparative cross-sectional study design among 418 selected pregnant women by systematic random sampling technique.

The study was approved by institutional review board (IRB) of Jimma University, institute of health. Verbal and written consent was obtained from mothers. Confidentiality of information was maintained.The data was collected by face to face interview using structured questionnaire and physical examination. Data was entered into EPI data version 4.3.1 and exported to SPSS version 20.0 for statistical analysis. Cross tabs and logistic regression were applied to determine the association of independent variables with outcome variable with specific AOR, 95% CI and p-value less than 0.05 was declared as statistically significant. The result of the study was presented by using tables, charts and narration.

Operational definition

- LMP is the woman's first day of the last menstrual period.

- Gestational age is referred to as the age of the unborn "baby" or as the number of days from the LMP or a period between the first day of the LMP of a pregnant woman to the day on which an assessment of gestation period is being made and is usually defined in weeks.
- Uncertain gestation - defined if the patient had any one of the following criteria: unknown LMP or she was not sure about it, irregular or prolonged cycle, lactational amenorrhea, history of recent contraceptive use or bleeding in early pregnancy.
- Certain gestation-defined as any patient who is sure of her LMP and it is normal, has no lactational amenorrhea and she did not experience bleeding early in pregnancy (mothers with no any mentioned criteria).

Result

Socio-demographic characteristics of study participants

A total of 418 pregnant women admitted to JMC for delivery were enrolled to the study. The mean age was 25.67±5.01 that ranges from 14-40 years. About 218 (52.2%) of the study subjects were living in urban area while the rest 200 (47.8%) were from rural. Majority of them were married 414(99.0%), Muslim 295(70.6%), Oromo 323(77.3%) and 145(34.7%) of them attend secondary education (Table 1).

Variables	Categories	Frequency	Percentage (%)
Residence	Urban	218	52.2
	Rural	200	47.8
	Total	418	100.0
Age in years	< 15	1	0.2
	15 - 19	37	8.9
	20 - 24	129	30.9
	25 - 29	157	37.6
	30 - 34	59	14.1
	≥ 35	35	8.4
	Total	418	100.0
Educational status	No formal education	110	26.3
	Primary school	145	34.7
	Secondary school	128	30.6
	College or university	35	8.4
	Total	418	100.0
Religious status	Muslim	295	70.6
	Orthodox	86	20.6
	Protestant	37	8.9
	Total	418	100.0
Ethnicity	Oromo	323	77.3
	Amhara	57	13.6
	Guraghe	20	4.8
	Dawuro	7	1.7
	Keffa	9	2.2
	Others	2	0.5
	Total	418	100.0

Occupation	Unemployed	12	2.9
	Merchant	98	23.4
	Daily laborer	32	7.7
	Government employee	136	32.5
	Farmer	107	25.6
	Others	33	7.9
	Total	418	100.0
Marital status	Married	414	99.0
	Unmarried	3	0.7
	Divorced	1	0.2
	Total	418	100.0
Family income	Extremely poor	88	21.1
	Moderately poor	82	19.6
	Near poor	171	40.9
	Low middle class	77	18.4
	Total	418	100.0

Table 1: *Socio- demographic characteristics of mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019*

Obstetric characteristics of study participant

The obstetric profile of the pregnant women showed majority of mothers were multigravida 228(54.5%) followed by primigravida 173(41.4%). About 361(86.4%) mothers started their first ANC visit and 180(43.1%) of mothers underwent U/S scanning during 2nd trimester of pregnancy. More than half of the subjects had four and more visit. Spontaneous vaginal delivery (SVD) is the most common mode of delivery (70.3%) followed by C/S (25.2%) and induced labor(16.0%). Immediate maternal complications were seen only among 19(4.5%) mothers. Majority of the delivered babies were alive 403(96.4%) with dominant Apgar score that belongs to 6-9(97.3%). Majority of babies (74.2%) had birth weight of 2500-3499 gram (Table 2).

Variables	Categories	Frequency	Percentage (%)
Parity	Primigravida	173	41.4
	Multigravida	228	54.5
	Grand multigravida	16	3.8
	Great grand-multigravida	1	0.2
	Total	418	100.0
Date of quickening	Known	1	0.2
	Unknown	417	99.8
	Total	418	100.0
Time of first ANC visit	1st trimester	28	6.7
	2nd trimester	361	86.4
	3rd trimester	6	1.4
	No visit	23	5.5
	Total	418	100.0
Number of ANC visit	No visit	23	5.5
	1 times	2	0.5
	2 -3 times	120	28.7
	≥ 4 times	273	65.3
	Total	418	100.0

Status of booking	Booked	125	29.9
	Unbooked	270	64.6
	Total	395	94.5
Time U/S scanning	1st trimester	17	4.1
	2nd trimester	180	43.1
	3rd trimester	27	6.5
	Not done	194	46.4
	Total	418	100.0
Pregnancy status	Planned	353	84.4
	Unplanned	65	15.6
	Total	418	100.0
Mode of delivery	SVD	294	70.3
	Assisted breech delivery	1	0.2
	Ventose	5	1.2
	Forceps	9	2.2
	Emergency C/S	101	24.2
	Elective C/S	4	1.0
	Destructive delivery	1	0.2
	Laparotomy	3	0.7
	Total	418	100.0
Need for induction of labor	Yes	67	16.0
	No	351	84.0
	Total	418	100.0
Immediate maternal complication	Yes	19	4.5
	No	399	95.5
	Total	418	100.0
Status of baby at birth	Alive	403	96.4
	Fresh still birth	13	3.1
	Macerated still birth	2	0.5
	Total	418	100.0
Apgar score	< 6	4	1.0
	6 - 9	392	97.3
	10	7	1.7
	Total	403	100.0
Birth weight in gram	< 2500	36	8.6
	2500 - 3499	310	74.2
	3500 - 3999	64	15.3
	≥ 4000	8	1.9
	Total	418	100.0
GA age at birth in weeks	< 37	21	5.2
	37 - 42	378	93.8
	≥ 42	4	1.0
	Total	403	100.0

Table 2: *Obstetric characteristics of mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Certainty of gestational age

Based on already mentioned criteria, the proportion of uncertain GA was determined among 268(64.1while the remaining 150(35.9%) were considered to be certain gestation(Figure 1).

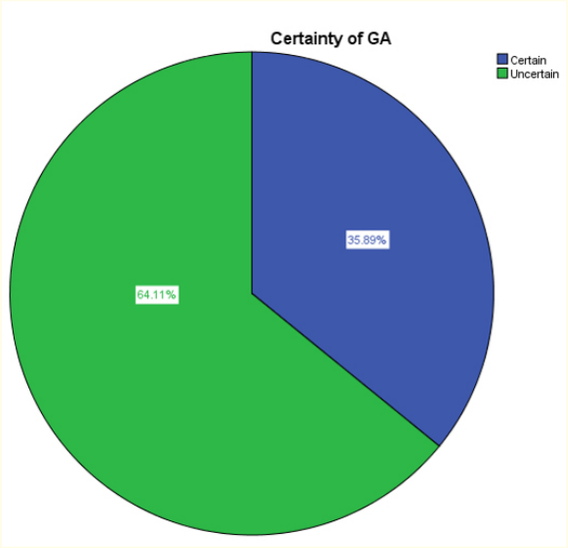

Figure 1: *Certainty of GA among mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Criteria of selecting subjects with uncertain and certain gestation

Certainty of GA was determined based on different criteria (unknown LMP, contraceptive use, irregular cycle, prolonged cycle, lactational amenorrhea and early pregnancy bleeding)(Table 3).

Variables	Categories	Certain GA		Uncertain GA		Total	
		Frequency	%	Frequency	%	Frequency	%
LMP	Known	150	35.9	35	8.4	185	44.3
	Unknown	0	0.0	233	55.7	233	55.7
	Total	150	35.9	268	64.1	418	100.0
Menstrual cycle	Regular	150	35.9	211	50.5	361	86.4
	Irregular	0	0.0	51	12.2	51	12.2
	Prolonged	0	0.0	6	1.4	6	1.4
	Total	150	35.9	268	64.1	418	100.0
Lactational amenorrhea	Yes	0	0.0	6	1.4	6	1.4
	No	150	35.9	262	62.7	412	98.6
	Total	150	35.9	268	64.1	418	100.0
Contraceptive use	Yes	27	6.5	93	22.2	120	28.7
	No	123	29.4	175	41.9	298	71.3
	Total	150	35.9	268	64.1	418	100.0
Early pregnancy bleeding	Yes	0	0.0	6	1.4	6	1.4
	No	150	35.9	262	62.7	412	98.6
	Total	150	35.9	268	64.1	418	100.0

Table 3: *Criteria used for selection of certainty GA among mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Among these criteria, majority of the pregnant mothers were determined to be uncertain GA by criteria of unknown LMP (86.9%) (Figure 2).

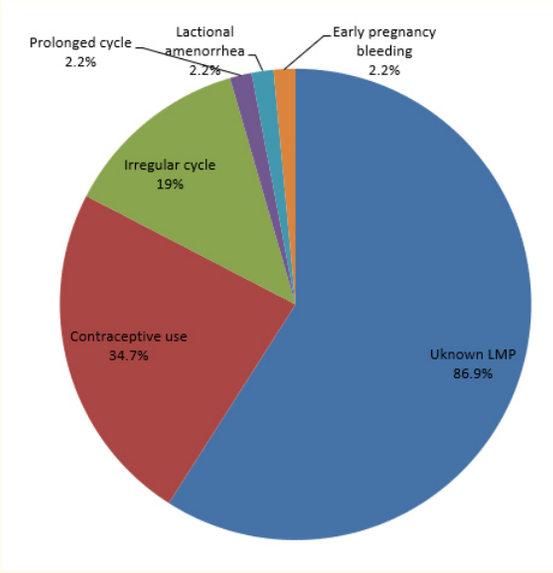

Figure 2: *Factors responsible for Uncertain GA among mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Factors associated with certainty of GA

To identify factors associated with certainty of gestational age, logistic analysis was applied. In the bivariate analysis, the candidate variables having p-value < 0.25 were selected for the final model. Accordingly about fifteen variables (residence, age, educational status, religion, occupation, family income, pregnancy status, time of first ANC visit, ANC visit, status of booking, time of U/S scanning, mode of delivery, status of baby at birth, birth weight, and gestational age at birth) were identified as the expected factors associated with certainty of gestational age with their specific COR, 95% CI and p-values as explained in table 4 in details.

Variables	Categories	Certainty of GA			COR (95% CI)	P- value
		Certain, No (%)	Uncertain, No (%)	Total, No (%)		
Residence	Urban	107 (25.6)	111 (26.6)	218 (52.2)	1	
	Rural	43 (10.3)	157 (37.6)	200 (47.8)	3.5 (2.2-5.4)	0.00*
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Age in years	<20	9 (2.2)	29 (6.9)	38 (9.1)	1.1 (0.4-3.2)	0.84
	20-34	132 (31.6)	213 (51.0)	345 (82.5)	0.5 (0.2-1.2)	0.14*
	≥35	9 (2.2)	26 (6.2)	35 (8.4)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Educational status	No formal education	22 (5.3)	88 (21.1)	110 (26.3)	8.7 (3.7-20.4)	0.00*
	Primary school	44 (10.5)	101 (24.2)	145 (34.7)	5.0 (2.2-11.1)	0.00*
	Secondary school	60 (14.4)	68 (16.3)	128 (30.6)	2.4 (1.1-5.4)	0.02*
	College/university	24 (5.7)	11 (2.6)	35 (8.4)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		

Religious status	Muslim	88 (21.1)	207 (49.5)	295 (70.6)	2.2 (1.1-4.4)	0.02*
	Orthodox	44 (10.5)	42 (10.0)	86 (20.6)	0.9 (0.4-1.9)	0.79
	Protestant	18 (4.3)	19 (4.5)	37 (8.9)	1	0.89
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Ethnicity	Oromo	101 (24.2)	222 (53.1)	323 (77.3)	2.2 (0.1-35.4)	0.57
	Amhara	30 (7.2)	27 (6.5)	57 (13.6)	0.9 (0.05-15.1)	0.94
	Guraghe	11 (2.6)	9 (2.2)	20 (4.8)	0.8 (0.04-14.9)	0.89
	Dawuro	3 (0.7)	4 (1.0)	7 (1.7)	0.3 (0.05-31.1)	0.85
	Keffa	4 (1.0)	5 (1.2)	9 (2.2)	1.2 (0.05-26.8)	0.88
	Other	1 (0.2)	1 (0.2)	2 (0.5)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Occupation	Unemployed	4 (1.0)	8 (1.9)	12 (2.9)	1.4 (0.3-5.8)	0.58
	Merchant	36 (8.6)	62 (14.8)	98 (23.4)	1.3 (0.5-2.8)	0.56
	Daily laborer	7 (1.7)	25 (6.0)	32 (7.7)	2.6 (0.8-7.7)	0.08*
	Government employee	73 (17.5)	63 (15.1)	136 (32.5)	0.6 (0.3-1.4)	0.24*
	Farmers	16 (3.8)	91 (21.8)	107 (25.6)	4.2 (1.7-10.0)	0.00*
	Others	14 (3.3)	19 (4.5)	33 (7.9)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Marital status	Married	149 (35.6)	265 (63.4)	414 (99.0)	1	
	Others	1 (0.2)	3 (0.7)	4 (1.0)	1.7 (0.17-16.3)	0.65
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Family Income	Extremely poor	15 (3.6)	73 (17.5)	88 (21.1)	6.8 (3.3-14.0)	0.00*
	Moderately poor	20 (4.8)	62 (14.8)	82 (19.6)	4.3 (2.2-8.5)	0.00*
	Near poor	70 (16.7)	101 (24.2)	171 (40.9)	2.0 (1.1-3.5)	0.01*
	Low middle class	45 (10.8)	32 (7.7)	77 (18.4)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Pregnancy status	Planned	137 (32.8)	216 (51.7)	353 (84.4)	1	
	Unplanned	13 (3.1)	52 (12.4)	65 (15.6)	2.5 (1.3-4.8)	0.00*
	Total	150 (35.9)	268 (64.1)	418 (100.0)		
Parity	Primipara	70 (16.7)	103 (24.6)	173 (41.4)	1	
	Multipara	75 (17.9)	153 (36.6)	228 (54.5)	0.6 (0.2-1.8)	0.37
	Others	5 (1.2)	12 (2.9)	17 (4.1)	0.8 (0.3-2.5)	0.76
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Time of first ANC visit	1st trimester	15 (3.8)	13 (3.3)	28 (7.1)	1	
	2nd trimester	131 (33.2)	230 (58.2)	361 (91.4)	2.0 (0.9-4.3)	0.07*
	3rd trimester	1 (0.3)	5 (1.3)	6 (1.5)	5.7 (0.5-55.9)	0.13*
	Total	147 (37.2)	248 (62.8)	395 (100.00)		
ANC visit	Yes	147 (35.2)	248 (59.3)	395 (94.5)	1	
	No	3 (0.7)	20 (4.8)	23 (5.5)	3.9 (1.1-13.5)	0.02*
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Immediate complication	Yes	6 (1.4)	13 (3.1)	19 (4.5)	1.2 (0.4-3.2)	0.68
	No	144 (34.4)	255 (61.0)	399 (95.5)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Status of booking	Booked	68 (17.2)	57 (14.4)	125 (31.6)	1	
	Unbooked	79 (20.0)	191 (48.4)	270 (68.4)	2.8 (1.8-4.4)	0.00*
	Total	147 (37.2)	248 (62.8)	395 (100.0)		

Time of U/S scanning	1st trimester	11 (2.6)	6 (1.4)	17 (4.1)	1	
	2nd trimester	92 (22.0)	88 (21.1)	180 (43.1)	1.7 (0.6-4.9)	0.28
	3rd trimester	10 (2.4)	17 (4.1)	27 (6.5)	3.1 (0.8-11.0)	0.07*
	Not done	37 (8.9)	157 (37.6)	194 (46.4)	7.7 (2.7-22.4)	0.00*
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Mode of delivery	SVD	117 (28.3)	177 (42.9)	294 (71.2)	1	
	Ventose	2 (0.5)	3 (0.7)	5 (1.2)	0.9 (0.1-6.0)	0.9
	Forceps	4 (1.0)	5 (1.2)	9 (2.2)	0.8 (0.2-3.1)	0.7
	Emergency C/S	24 (5.8)	77 (18.6)	101 (24.5)	2.1 (1.2-3.5)	0.00*
	Elective C/S	3 (0.7)	1 (0.2)	4 (1.0)	0.2 (0.02-2.1)	0.19*
	Total	150 (36.3)	263 (63.7)	413 (100.0)		
Need for induction of labor	Yes	20 (4.8)	47 (11.2)	67 (16.0)	1.38 (0.7-2.4)	0.26
	No	130 (31.1)	221 (52.9)	351 (84.0)	1	
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Status of baby at birth	Alive	149 (35.6)	254 (60.8)	403 (96.4)	1	
	Still birth	1 (0.2)	14 (3.3)	15 (3.6)	8.2 (1.1-63.1)	0.04*
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
Apgar score	<6	1 (0.2)	3 (0.7)	4 (1.0)	1.2 (0.07-19.6)	0.9
	6-9	146 (36.2)	246 (61.0)	392 (97.3)	0.7 (0.1-3.5)	0.6
	10	2 (0.5)	5 (1.2)	7 (1.7)	1	
	Total	149 (37.0)	254 (63.0)	403 (100.0)		
Birth weight in gram	≤2499	12 (2.9)	24 (5.7)	36 (8.6)	1	
	2500-3499	102 (24.4)	208 (49.8)	310 (74.2)	1.02 (0.5-2.1)	0.96
	3500-3999	32 (7.7)	32 (7.7)	64 (15.3)	0.5 (0.2-1.2)	0.10*
	≥4000	4 (1.0)	4 (1.0)	8 (1.9)	0.5 (0.1-2.3)	0.38
	Total	150 (35.9)	268 (64.1)	418 (100.00)		
GA at birth in weeks	<37	5 (1.2)	16 (4.0)	21 (5.2)	1	
	37-42	143 (35.5)	235 (58.3)	378 (93.8)	0.5 (0.2-1.4)	0.20*
	≥42	1 (0.2)	3 (0.7)	4 (1.0)	0.9 (0.1-11.1)	0.9
	Total	149 (37.0)	254 (63.0)	403 (100.0)		

Table 4: *Association of certainty of GA and other variables by bivariate logistic regression analysis among mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Further, multivariate analysis (binary logistic regression with enter methods) was used to identify the main predictor variables. Finally,three variables [educational status(no formal education), time of ultrasound scanning (not done) andmode of delivery (emergency C/S)]were identified as the factors associated with certainty of gestation age among mothers with p-value less than 0.05 and specific AOR (95% CI)(Table 5). Mothers who had no formal education were 3.2 times more likely to be uncertain [AOR=3.246 (95% CI=0.962-10.736)]. Mothers who don not underwent U/S scanning were 5.8 times more likely to be uncertain GA [AOR=5.867 (95% CI=1.056-34.439)].In addition, the likelihood of delivering by mode of emergency C/S was 2.6 times more common among pregnant mothers with uncertain GA[AOR=2.652 (95% CI=1.418-4.958)].

Variables candidate for multivariate logistic regression	Sig.	Exp (B)	95% C.I. for AOR	
		AOR	Lower	Upper
Residence (Rural)	0.239	1.483	0.770	2.856
Age (20 - 34 years)	0.807	1.139	0.401	3.236
Educational status (No formal education)	0.049	3.246	0.962	10.736
Educational status (Primary school)	0.06	2.762	0.974	7.830
Educational status (Secondary school)	0.204	1.895	0.706	5.083
Religion (Muslim)	0.895	1.064	0.427	2.652
Occupation (Daily laborer)	0.201	2.481	0.617	9.979
Occupation (Government employee)	0.827	0.892	0.320	2.489
Occupation (Farmer)	0.724	1.252	0.360	4.353

Monthly income (Extremely poor)	0.554	1.445	0.427	4.885
Monthly income (Moderately poor)	0.815	1.123	0.425	2.969
Monthly income (Near poor)	0.409	1.334	0.673	2.644
Pregnancy status (Unplanned)	0.356	1.524	0.623	3.729
Time of first ANC visit (2nd trimester)	0.608	0.716	0.200	2.566
Time of first ANC visit (3rd trimester)	0.990	1.020	0.055	18.911
Status of booking (Unbooked)	0.390	1.319	0.701	2.482
Time of U/S scanning (3rd trimester)	0.212	3.353	.501	22.456
Time of U/S scanning (Not done)	0.049	5.867	1.056	34.439
Mode of delivery (Emergency C/S)	0.002	2.652	1.418	4.958
Mode of delivery (Elective C/S)	0.598	0.507	0.041	6.337
Birth_weight_in gram (3500-3999)	0.638	1.367	0.373	5.011
GA at birth in weeks (37-42)	0.435	0.519	0.100	2.690

Table 5: *Association of certainty of GA and other variables by multivariate logistic regression analysis among mothers admitted for delivery at Jimma Medical Center, South West Ethiopia, 2019.*

Discussion

A total of 418 pregnant women were included in the study with mean age of 25.67±5.01 that ranges from 14-40 years and there was no mean difference of age between groups (mothers with certain GA and uncertain GA) which was also supported by other studies [10,13]. Among rural dwellers the groups of mothers with uncertain GA were dominant (37.6%).

The objective of the present study was to discriminate the proportion of certainty of GA and determine the associated factors. Certainty of GA was identified by the following criteria: unknown LMP, irregular or prolonged cycle, lactational amenorrhea, history of recent contraceptive use and bleeding in early pregnancy.

In the present study, the proportion of uncertain gestation was 64.1% while the remaining 35.9% belongs to certain GA. This finding was also in harmony with study ofAbdella[13]. But, this was relatively higher if compared to other studies [3–5,7]who reported proportion of uncertain GA from 7.1%-24.9%. The study conducted in Zimbabwe and Sudan showed low proportion of uncertain GA (21.4% and 42.9%)respectively[12,13]. It could be due to socio-demographic difference.

Unknown LMP was a major contributory factor (86.9%) for uncertain GA which was higher than the studies of Abdulkadir et al (55%) [14],Abdella KA (73.2%)[13] and Hall et al (12.3%)[7]. This can be explained by socio-demographic difference.

Having no formal education in comparison to other educational status increases the probability of uncertain GA by 3.2 times. This finding was also supported by other studies [7,12,13]. Pregnant mothers who do not underwent U/S scanning had 5.8 times likely to be uncertain GA and this finding is in line with studies of Abdella KA[13]for possible justification of high illiteracy ratio, no ANC follow-up, low socioeconomic status and less utilization of technology. But, this finding was against the study of Hall et al [7]who reported the high proportion of U/S scanning among uncertain GA due population difference of Jimma and UK.

In comparison to mothers with certain GA, mothers with uncertain GA were 2.6 times more likely to deliver by emergency C/S which was also in harmony with other studies [7,12,13].This could be explained by the fact that in women with certain gestation the time of caesarean section is known before hand, but in uncertain gestation, the physicians try to avoid delivering a preterm baby, may defer the time

of the operation until the patient goes into labor, thus performing the operation under unfavorable circumstances with the consequent maternal and fetal hazards.

Conclusion and Recommendations

This study showed that uncertain gestation is associated with adverse maternal and fetal outcome such as increased in the rate of emergency C/S, low birth weight, prematurity, and still birth. Sociodemographic factors like rural residence, low socio-economic status and low education level have influence in resulting uncertain gestation. And also pregnant mothers with uncertain gestation tend to have late or no U/S scanning, poor ANC and unplanned pregnancy. The study also identified that having no formal education, no U/S scanning and emergency C/S were the independent factors associated with uncertain GA.

Overall,the present study showed that unknown LMP is the main reason responsible for uncertain gestation and high proportion of uncertain GA (64%).

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Volume 9 Issue 1 January 2020