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Original articles*

EARLY ANTENATAL CARE BOOKING AND ITS ASSOCIATION WITH LATE PREGNANCY COMPLICATIONS IN ARBA MINCH GENERAL HOSPITAL, SOUTHERN ETHIOPIA, 2016

REZERVACIJA RANE PRENATALNE NEGE I NJENA POVEZANOST SA KOMPLIKACIJAMA U KASNOJ TRUDNOĆI U GENERALNOJ BOLNICI ARBA MINCH, JUŽNA ETIOPIJA, 2016

Correspondence to:

Tadele Girum

girumtadele@yahoo.com

Tel: +251913652268

Gesila Endashaw¹, Mulugeta Shegaze¹, Tadele Girum²

¹ Department of Nursing, College of Medicine and Health Sciences, Arbaminch University, Arbaminch, Ethiopia

² Department of Public Health, College of Medicine and Health Sciences, Wolkite University, Wolkite, Ethiopia

Key words

ANC booking, late pregnancy complications, Gestational age, Arbaminch

Ključne reči

rana rezervacija ANC-a, komplikacije u kasnoj trudnoći, gestacijska dob, Arbaminch

Abstract

Back ground: Early initiation of and properly timed antenatal care (ANC) is thought to reduce the risk of late pregnancy complication. To this end current study examined if timing of the first ANC visit influences the risk of late pregnancy complication. Status of early antenatal care booking and its association with late pregnancy complication is not yet studied in Ethiopia in general. Therefore, this study aimed to assess timing of antenatal care booking and its association with late pregnancy complications in Arbaminch general hospital.

Method: Hospital based comparative Cross-sectional study was conducted in Arbaminch Hospital. All delivery records of the year 2015 were included. A total of 670 medical records were used to collect data by using checklist. Binary and multiple logistic Regression was carried out adjusting for maternal characteristics using SPSS version 20. Chi square test was used for group comparison. **Result:** The level of early booking for ANC is 24.2%. The prevalence of late pregnancy complication; severe pre-eclampsia, anemia and eclampsia was prevalent in 16.1%, 19.3 % and 10.6% respectively. Late commencing ANC associated was significantly associated with severe pre-eclampsia (AOR=2.77, 95 % C.I:1.44-5.3), eclampsia (AOR=3.9, 95 % C.I:1.7-9.01), anemia (AOR=2.04, 95% C.I:1.2-3.5). **Conclusion:** Mean antenatal care is not providing its promises for the study area. Late pregnancy complication is more common in late booked mothers than early booked for antenatal care. There for intervention is needed to early initiate first visit.

INTRODUCTION

Antenatal care (ANC) is a health service that has the potential to reduce the incidence of perinatal morbidity and mortality by treating medical conditions, identifying and reducing potential risks, and helping women to address behavioral factors that contribute to poor outcome. Prenatal care is more likely to be effective if women begin receiving care in the first trimester of pregnancy and continue to

receive care throughout pregnancy, according to accepted standards of periodicity ⁽¹⁾.

While motherhood is often a positive and fulfilling experience; for many women it is associated with suffering, ill-health and even death. Globally, an estimated 289,000 mothers died in 2013 in pregnancy and child birth, with more than one life lost every 2 minute. According to world health organization (WHO), in the developing world Over 30 mil-

lion women suffer each year from serious obstetric complications as a result of inadequate or inappropriate care during pregnancy, delivery and the first few critical hours after birth. Developing regions account for approximately 99% (302 000) of the global maternal deaths in 2015, with sub-Saharan Africa (SSA) alone accounting for roughly 66% (201 000) and Ethiopia accounts 420 maternal death per 100 000 live births (1, 2)

Ten percent of women have high blood pressure during pregnancy, and preeclampsia complicates 2% to 8% of pregnancies. Overall, 10% to 15% of direct maternal deaths are associated with preeclampsia and eclampsia. WHO estimated the incidence of preeclampsia to be seven times higher in developing countries than developed countries. The Ethiopian National Emergency Obstetric and Newborn Care (EMONC) showed that preeclampsia contributed for the complication of approximately 1% of all deliveries and 5% of all pregnancies. Moreover, 16% of direct maternal mortality and 10% of all maternal mortality (direct and in direct) was due to preeclampsia/eclampsia^(3, 4).

Early initiation of ANC and adequate follow-up visits facilitate early screening for potential problems which complicate at late pregnancy periods⁽⁵⁾. Although the proportion of women receiving antenatal care at least once during pregnancy was 83% globally for the period 2007–2014, In SSA, 69 % of pregnant women have at least one ANC visit (1). In Ethiopia 41% of pregnant women receive ANC of this 18% of women made their first ANC visit before the fourth month of pregnancy⁽⁶⁾. Two studies in Southern Ethiopia, shows early ANC booking as 17.4%(7), and 31.4 %⁽⁸⁾. Even though, early booking for ANC provides preventive access for mothers, complications from pregnancy are a major cause of death among women in low and middle-income countries; late booking for first ANC is common problem.

Therefore, to reduce the level of late complication early initiation of ANC is appropriate and measuring the level of complication associated to late initiation is also appropriate to focus priority intervention in developing countries; therefore this study aims to measure the level of late initiation and its association with late pregnancy complications.

METHODS

Study design and settings

This comparative cross-sectional study was conducted in Arba Minch General hospital, Southern Ethiopia through reviewing records of delivery attendants of the year 2015. Arba Minch General hospital is the only hospital in the town providing care for 142,908 of the towns population and serve as a referral center for the catchment areas. There are also two public health centers which offer delivery service and other maternal health packages. A large proportion of mothers are attending at the hospital. The total delivery report of the year 2015 was found to be 2571 among this 1031 have ANC follow up in the hospital and gave birth in the hospital.

Study population and sampling technique

All mothers who gave birth in Arba Minch hospital were source populations, while all maternal delivery records in the hospital of the year 2015 were the study populations. All delivery records of the 2015 year population were included.

A Total of 1031 delivery records with ANC follow up taken place in the hospital and give birth in the hospital were found, among this 670 records were complete records; hence 670 records were included in the study.

Data Collection Procedure and Data Quality Control

The data was obtained from admission registration log-books, delivery registration books and patient charts using reviewer administered technique. The checklist was adapted from Palo Alto Medical Foundation Pregnancy Questioner, Pregnancy Risk Assessment Monitoring System (PRAMS), Human Fertilization and Embryology Authority (pregnancy outcome form) and journal articles⁽⁹⁾. After necessary modification and changes that had been made based on the pre-test the final study was conducted by trained six midwives. The checklist sought information on socio-demographic factors, obstetric factors, and pre-existing and pregnancy related diseases, timing of ANC and related questions.

Study variables and Data analysis

The outcome variables is late pregnancy complications (sever pre-eclampsia, eclampsia, and anemia; and the independent variables were timing of first ANC booking, Socio demographic factors (Age, residence, Parity, weight, alcohol intake, smoking, and substance abuse), Pre-existing medical conditions (maternal diabetes (DM), chronic HPN, renal disease, malaria, STIs, HIV), obstetrics factors, (intra-partum hemorrhage, PROM). After data collection, each questionnaire was checked for completeness and consistency. Then, Data was cleaned, coded and entered into Epi-info version 7 and exported to SPSS version 20 for analysis.

Exploratory data analysis carried out to check the levels of missing values, presence of influential outliers, independence of errors, multi-collinearity and normality. Binary and multiple logistic regressions were run to assess the association of various factors with late complications. Groups were compared with chi-square test. The final binary logistic regression model was fitted with variables significant at level of $p.value < 0.25$. The fitness of the model was checked by Hosmer and Lemeshow test. The strength of association of predictor variables were assessed using odds ratio and significance of variables were reported by using 95% confidence interval and $p-values < 0.05$.

Operational definition:

- Late booking: Mother who initiated antenatal care after 16 weeks of gestational age.
- Early booking: Mother who initiated antenatal care before or at 16 weeks of gestational age.
- Late pregnancy complications: severe pre-eclampsia, eclampsia and anemia.
- Complete charts: readable, contains both antenatal care service register and delivery report.

Ethical statement

Ethical clearance and support letter was obtained from Institutional Review Board (IRB) of Jimma University. Permission to conduct the study also was obtained from Hospital Director office and department of Obstetrics and Gynecology. Informed consent was not obtained from each

study participants because the study used secondary data from records in which there are no means to get the participants. All data obtained from them were kept confidential by using codes instead of any personal identifiers.

RESULT

A total, 2571 delivery records were registered in Arbaminch general hospital in the year 2015. Of this 1031 maternal delivery records were with ANC follow up in the hospital and gave birth in the hospital. From 1031 medical records 670 were found to be complete records (included in the study), the rest are incomplete.

Socio-demographic characteristics

The mean age of the mothers was 25.92 years (± 4.89), with minimum age 15 and maximum age 47, about half,323 (48.2 %)of mothers were within 18-24 years of age group. The majority of mothers were married 612 (91%), more than half were from urban kebeles 369(55.5%) andthey don't have history of substance abuse606 (90.6%).

Obstetrics and medical history

More than half of mothers 373 (55.7%) were multiparas, they gave birth of one to seven children and About thirteen percent had history of miscarriage 85 (12.7 %) while moth-

Table 1. Socio demographic, past obstetrics and past medical condition of the participants in Arba Minch general hospital, May, 2016

Variables		Frequency	Percentage
Marital status	Single	34	5
	Married	615	90
	Divorced	15	2.2
	Widowed	6	1
Residence	Urban	369	55.5
	Rural	301	44.9
Age of the mothers	15-24	323	48.2
	25-34	313	46.7
	Above 35	34	5.1
substance abuse*	Yes	64	9.55
	No	606	90.5
Miscarriage history	Yes	85	12.7
	No	585	87.3
History of still birth	Yes	75	11.2
	No	595	88.8
Parity	Primipara	297	44.3
	Multipara	373	55.7
Heart disease	Yes	96	14.3
	No	574	85.7
Respiratory disease	Yes	79	11.8
	No	591	88.2
Seizure or epilepsy	Yes	60	9
	No	610	91
Diabetes	Yes	23	3.4
	No	647	96.6
Kidney disease	Yes	83	12.4
	No	587	87.6

*substance abuse: alcohol intake, smoking, chewing chat together

ers with History of still birth were about 75 (11.2 %). From the total 96 (14.3%) of the mothers had history of heart disease, 79 (11.8 %) had history of respiratory disease. Similarly, History of Seizure, diabetes mellitus, and kidney disease were prevalent in 60(9%), 23 (3.4%) and 83 (12.4 %) of mothers respectively (Table 1).

Antenatal care services

Timing of First ANC Attendance:Information on timing of first ANC was collected from the logbook or client's card.Accordinglyfrom the total mothers who had ANC visits in the hospital last year, one hundred sixty two mothers (24.2%) commenced ANC early before 16 weeks of gestation and five hundred eight (75.8%) commenced their first ANC after 16 weeks of gestation. The timing of first ANC was 23.88 weeks (± 7.429), which ranges from ninth week to thirty sixth week during pregnancy. Only about 26(3.9%) mother visited ANC four and more times in number.

One hundred thirty five (20.1%) of mothers had Hemoglobin concentration of less than or equal to 7 mg/dl, 85(12.7%) were found to be positive for both protein and glucose, 95 (14.2%) had high blood pressure defined by blood pressure greater or equal to 140/90 mmHg. From the total reviewed records about 532 (79.4%) of mothers have ultrasound monitoring for fetal growth and other reasons, About 600 (89.6%) got at least one tetanus toxoid vaccine and 365 (54.5%) got iron and folic acid at least one dose during their ANC visit in the year (Table 2).

Table 2: ANC service condition of the mothers in AMJH, 2016

Variables		Frequency	Percentage
Gestational age at first antenatal visit	Early <=16 weeks	162	24.2
	Late >16 weeks	508	75.8
Tetanus toxoid	yes	600	89.6
	No	70	10.4
Hemoglobin concentration at first ANC visit	<=7mg/dl	135	20.1
	<=11mg/dl	342	51
	>11mg/dl	193	31.5
Iron and folic acid intake	Yes	365	54.5
	No	289	43.7
Urine analysis	Positive for protein & glucose	85	12.7
	Negative for protein& glucose	585	87.3
Ultrasonography imaging	Yes	532	79.4
	No	136	20.3
Nutrition education	Yes	604	90.1
	No	66	9.9
high blood pressure 140/90mmHg	Yes	95	14.2
	No	575	85.8
HV test	Positive	10	1.5
	Negative	660	98.5
Sexually transmitted infections test (VDRL TEST)	Positive	31	4.6
	Negative	639	95.4

Late pregnancy complications

This study indicated that the prevalence of sever pre-eclampsia was 108(16.1%), complicating late pregnancy of the pregnant women. While eclampsia complicated about 71 (10.6 %) of the pregnancies and Anemia is the most common

problem of the pregnant women which complicated late pregnancy 129(19.3%) of mothers. Uncontrolled diabetes mellitus and hypertension were also among complications from which women suffered (Table3).

Comparison of factors between early and late booked for antenatal care

Socio-demographic Characteristics

Booking for antenatal care had no significant differences for both populations with respect to age group, but age group 15-24 and age above 35 tend to commence antenatal care early and age group 25-34 tend to commence antenatal care late as the proportion shows. Majority, Single 32 (6.3 %), and married 468 (92.1%) women started antenatal care late, while divorced 8 (4.9) and widowed 5 (3.1 %) women started antenatal care early. The difference between the two group was found to have significant association ($X^2= 24.64$, $p<.001$). Regarding residence 89 (54.9%) early booked and 280 (55.1%) late were from rural kebeles and 73(45.1%) early booked and 228 (44.9%) late booked were from urban kebeles. This difference is not significant ($x^2=.002$, $p\text{ value}=.520$) (Table 4).

Past obstetric history

From early booked for antenatal care 73 (45.1%) and 89 (54.9%) were primipara and multipara respectively, while from late booked for antenatal care 224 (44.1%) and 284 (55.9%) were primipara and multipara respectively. This difference had no association with the group ($X^2=.047$, $p\text{-value} .450$). Majority of mothers with bad past obstetric history tend to commence antenatal care early. Those mothers with still birth history and miscarriage history 37(22.8%) and 40 (24.7%) booked early for antenatal care while 38(7.5%) and 45 (8.9 %) were late booked respectively. The difference was significantly associated ($x^2=29.148$, $p\text{-value}<.001$) for history of still birth, and ($x^2 = 27.798$, $p\text{-value}<.001$) history of miscarriage) (Table 4).

Past medical history and antenatal service

Majority of mothers with medical disease history tend to visit antenatal care early during their pregnancy. Among women with history of heart disease 45 (27.8 %) commenced their antenatal care early while 51 (10 %) of these women commenced late. Mother with seizure 26 (16%) and respiratory disease (23 (14.2%) booked early for antenatal whereas 34 (6.7%) of women with seizure and 56 (11%) of women with respiratory disease booked late. This difference is significantly associated for seizure with ($X^2 =13.189$, $p\text{-value} <.001$) but difference for respiratory disease is not significantly associated ($X^2=1.19$, $p\text{-value}=.170$).

Similarly women with sexually transmitted infection commenced early antenatal care, the difference was significant ($X^2=24.418$, $p\text{-value} <.001$). Majority of women those started antenatal care late, commenced antenatal care after already developed anemia, with hemoglobin concentration

Table:3. late pregnancy complications of mothers in AMJH, 2016.

Variables		Frequency	Percentage
Sever pre-eclampsia	Yes	108	16.1
	No	562	83.9
Anemia	Yes	129	19.3
	No	541	80.7
DM	Yes	10	1.5
	No	660	98.5
Uncontrolled HPN	Yes	12	1.8
	No	658	98.2
Eclampsia	Yes	71	10.6
	No	599	89.4
APH	Yes	28	4.2
	No	642	95.8

Table 4: comparison between early and late antenatal care booking in AMJH, 2016

Variables		Gestational age category		X2 test
		Early <=16 wks (n %)	Late >16 Wks (n %)	
Age of the mothers	15-24	86 (53.1)	237 (46.7)	2.465, p =.292
	25-34	67 (41.4)	246 (48.4)	
	>=35	9 (5.6)	25 (4.9)	
Marital status	Single	2(1.2)	32 (6.3)	24.641, p<.001
	Married	147 (90.7)	468(92.1)	
	Divorced	8 (4.9)	7 (1.4)	
	Widowed	5 (3.1)	1(0.2)	
Parity	Primipara	73 (45.1)	224 (44.1)	.047 p- .450
	Multipara	89 (54.9)	284(55.9)	
Residence	Rural	89 (54.9)	280 (55.1)	.002, p=.520
	Urban	73 (45.1)	228 (44.9)	
Miscarriage history	Yes	40 (24.7)	45 (8.9)	27.798, p=.000
	No	122 (75.3)	463 (91.1)	
Still birth history	Yes	37 (22.8)	38 (7.5)	29.148, p=.000
	No	125 (77.2)	470 (92.5)	
History of heart disease	Yes	45 (27.8)	51 (10)	31.485 p<.001
	No	117(91.4)	457 (88.8)	
Respiratory disease	Yes	23 (14.2)	56 (11)	1.19, p= .170
	No	139 (85.8)	452 (89)	
Seizure and epilepsy	Yes	26 (16)	34 (6.7)	13.189, <.001
	No	146 (90.1)	460 (90.6)	
Diabetes mellitus	Yes	10 (6.2)	13 (2.6)	4.84, p= .030
	No	152 (93.8)	495 (97.4)	
Kidney disease	Yes	33 (20.4)	50 (9.8)	12.543, p=.001
	No	129 (79.6)	458 (90.2)	
Urine analysis	Negative	15 (9.3)	70 (13.8)	2.266, p= .083
	Positive	147 (90.7)	438 (86.2)	
STI (VDRL) test	Positive	19(11.7)	12(2.4)	24.418 p<.001
	Negative	143(88.3)	496 (97.6)	
Hemoglobin . concentration at first visit	<=7 mg/dl	19 (11.7)	116 (22.8)	11.235, p =.004
	7-11mg/dl	85 (52.5)	257 (50.6)	
	>11mg/dl	58 (35.8)	135 (26.6)	
Tetanus toxoid vaccine	Yes	148 (91.4)	452 (89)	.745, p= .240
	No	14 (8.6)	56 (11)	
Nutrition information	Yes	154 (95.1)	450 (88.8)	5.806, p= .009
	No	8 (4.9)	58 (11.4)	
Iron and folic acid s upplementation	Yes	64 (39.5)	301 (60.7)	22.176, p<.001
	No	98 (60.5)	195 (39.3)	

less than or equal to eleven 373 (73.4%) while those who commenced early were not anemic 104 (64.2%). The difference was significantly associated ($X^2=11.235$, p -value=.004) (Table 4)

Comparison of late pregnancy complication between early booked and late booked mothers

Majority of late pregnancy complications were found to be more common among late booked than those who booked early. Severe pre-eclampsia was 95(18.7%) among late booked while 13 (8%) among early booked. This difference is significantly associated with ($X^2=10.354$, $p=.001$). Most mothers with Eclampsia were from late booked 64(12.6%) and 7 (4.3%) were from early booked, the difference is significant at ($X^2=8.883$, $p=.001$). Similarly anemia found to be more common among late booked than early booked mothers which was 110 (21.7%) among late booked and 19 (11.7%) among early booked which is significantly different ($X^2=7.773$, $p=.001$) (Figure 1)

Logistic regression analysis

Multiple logistic-regression analysis was used to evaluate the association between timing of antenatal care booking and severe pre-eclampsia, eclampsia and anemia. The estimates were adjusted for maternal age, parity, substance abuse, weight of the mothers, residence, history of still birth and miscarriage, iron supplementation during pregnancy, nutrition education, and medical disorders.

Mothers who had commenced antenatal care early were more likely to be protective to develop severe pre-eclampsia as compared with mothers who commenced antenatal care late during their pregnancy. Those who started antenatal care after sixteen weeks of gestation were about three times more likely to have severe pre-eclampsia as compared to mothers who started before sixteen weeks of gestation (AOR=2.77, 95 % C.I:1.44- 5.3, p - value=.002). Mothers who commenced antenatal care late were found to be two times more likely to be anemic, as compared to mother who commenced early and Mothers who commenced their antenatal care after sixteen weeks of gestation were also four times more likely to develop late complications (AOR=3.9, 95 % C.I:1.7-9.01, p - value= .001) (Table 5).

Table:5. multiple logistic regression model for associating of antenatal care timing with late pregnancy complication in AMJH, 2016

Variables	n/N(%)	COR 95 % C.I	AOR 95% CI
Severe pre-eclampsia			
Early (<=16wks)	13/670 (1.94)	1	1
Late (>16wks)	95/670 (14.2)	2.636 (1.5, 5)	2.77 (1.44,5.3)
Anemia			
Early (<=16wks)	19/670 (2.84)	1	1
Late (>16wks)	85/670 (12.86)	2.1 (1.23, 3.51)	2.04 (1.2, 3.5)
Eclampsia			
Early (<=16wks)	7/670 (1.05)	1	1
Late (>16wks)	64/670 (9.55)	3.2 (1.43, 7.13)	3.9 (1.7,9.01)

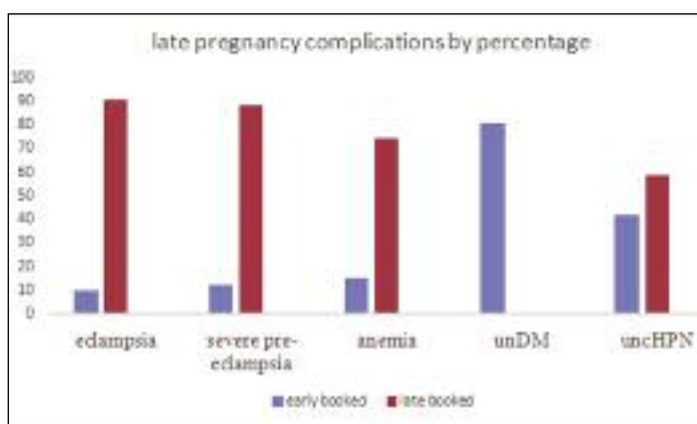


Figure: 1. Prevalence of late pregnancy complication among time-ly booked and lates, AMJH 2016

DISCUSSION

This study showed that the level of early antenatal care booking is 24.2% which is similar to the studies conducted in Mekele Town and Kembata Tembaro Zone. According to Ethiopian Demographic and health survey 2014, 18% of women made their first ANC visit before the fourth month of pregnancy, in Arbaminch Town it was reported that the proportion of first ANC within the recommended time (before or at 16 weeks of gestation) was 32.7%, 31.4 %, 17.4% respectively in different studies (7-9). Such difference may be due to methodological difference (since the former study was community based study there might be difference regarding ANC seeking behavior.

Late pregnancy complication

The level of hypertensive disorders (pre-eclampsia and eclampsia) in current study was 108(16.1%) and 71(10.6%) respectively. This is smaller than study reported in Mettu Hospital which revealed severe preeclampsia was prevalent in 35.5%, and eclampsia in 19% of mothers (10). However, the study in Mettu hospital was among pregnancy complications which may make these complications dominant. But higher than studies in Dessie referral hospital in which severe pre-eclampsia was prevalent among 8.4% (11), in Jimma University Hospital (7.6%) (12), and in India, Pre-eclampsia was prevalent in (25.33%) (13), this difference might be due to life style difference between the study populations.

In the current study anemia was 129(19.3%) prevalent, which is nearly in line with study conducted in Black lion hospital of 21.3% (14). But is smaller than studies reported in Boditti Health Center in Southern Ethiopia 61.6% (15), in Gilgel Gibe Dam area 53.9%; (16), in Southeast Ethiopia 27.9% (17), in Nigeria 27.6% (18) and in Eastern Sudan, Kassala hospital (41.8%)(19). On the other hand the finding of this study is higher than study in India (2.89%)(13). these discrepancies may be due to a difference in socio-economic and educational status between the study populations in these study areas.

Comparison early booked VS late booked for antenatal care

Women with bad past obstetrics history, advanced age (above 35 years) and medical problem tend to commence antenatal care early as compared to those without the conditions above. This finding is consistent with study in Kambata Tambaro Zone ⁽⁹⁾. Study indicated that women delay to seek antenatal care if they did not experience discomfort or illness related to their pregnancy. Single mothers, teenagers, with no medical problem, with no bad past obstetrics history and rural women booked late. The study revealed that women with one birth and above were more likely to register lately compared to those who have no parity in turn. Also commencing antenatal care at late is found to be highly associated with anemia. This agrees with studies conducted in Kenya and Addis Ababa ^(14, 20)

This study indicated that late pregnancy complication were higher among late booked mothers for antenatal care as compared to mothers who booked early for antenatal care. Early booking is a factor associated with late pregnancy complication.

Conclusion and recommendation

Mean antenatal care is not providing its promises for the study area. Late pregnancy complication is more common in late booked mothers than early booked for antenatal care. There for intervention is needed to early initiate first visit.

Acknowledgements

We would like to thanks Jimma University, Arba Minch hospital and their officials. We would also appreciate the efforts of data collectors and the help provided by friends.

Sažetak

Background: Smatra se da rano započinjanje i propisno vreme antenatalne nege (ANC) smanjuju rizik od komplikacija u kasnoj trudnoći. U tu svrhu studija je proučavala kako vreme prve posete ANC-a utiče na rizik od komplikacija kasne trudnoće. U Etiopiji se uopšte ne proučava stanje rezervacije rane prenatalne nege i njegova povezanost sa komplikacijama kasne trudnoće. Zbog toga je ova studija imala za cilj da proceni vremenski raspored rezervacije za antenatalnu negu i njegovu povezanost sa komplikacijama kasne trudnoće u generalnoj bolnici Arbaminch. **Metod:** Komparativna studija preseka sprovedena je u bolnici Arbaminch. Uključeni su svi porođaji za 2015. godinu. Za prikupljanje podataka korišćeno je ukupno 670 medicinskih zapisa. Binarna i višestruka logistička regresija izvršena je prilagođavanjem materinskim karakteristikama koristeći SPSS verziju 20. Chai kvadratni test korišćen je za upoređivanje grupa. **Rezultat:** Nivo ranog rezervisanja za ANC je 24,2%. Rasprostranjenost komplikacija kasne trudnoće bile su teška preeklampsija, anemija i eklampsija preovlađuju u 16,1%, 19,3% i 10,6% respektivno. Kasnije započinjanje ANC značajno je povezano sa teškom preeklampsijom (AOR = 2.77, 95% CI: 1.44-5.3), eklampsijom (AOR = 3.9, 95% CI: 1.7-9.01), anemijom (AOR = 2,04, 95% CI : 1.2-3.5). **Zaključak:** Srednja antenatalna nega ne daje sigurnost za područje studiranja. Kasne komplikacije trudnoće su češće kod kasno primljenih majki na antenatalnu negu. Potrebno je intervenisati da bi se što pre desila prva poseta.

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