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Research Article

Incidence and Its Predicators of Neonatal Jaundice Among Admitted Neonates at Ameya Primary Hospital, South West Shoa Zone, Ethiopia, 2025

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Abstract

Introduction: Newborn jaundice looks in most neonates as "physiological jaundice" in the first limited weeks of life; nevertheless, pathological jaundice is linked with an enlarged hazard of long-term difficulties and death. Only a limited investigation has been done on the predictors of newborn jaundice in Ethiopia. The objective of this investigation was to distinguish the predictors of newborn jaundice among neonates admitted to Ameya primary hospitals. *Objectives:* To evaluate incidence and its predicators of Neonatal Jaundice amongst Admitted Neonates at Ameya Primary Hospital, South West Shoa Zone, Ethiopia, 2025. *Methods:* An institutional-based; Retrospective follow-up research design was conducted amongst 414 of neonates. Simple random sampling methods was used to choose study participants. Epidata version 4.62 was used for data entry then exported to STATA version 14.1. Study variables with p-values < 0.25 were moved to multivariable Cox regression models. Adjusted odd ratio with 95% confidence interval was calculated, and the p-value < 0.05 was considered statistically significant in the multivariable model. The findings were stated using text, table and graphs. *Results:* A data were gathered from 414 and 407 neonates had completed information giving the response rate of 98.3%. The total incidence rate of jaundice among neonates was 20.12 per 1000 person-days (95% CI: 15.33-26.41). Male neonates 2.43 [AHR= 2.43; 95% CI (1.21-4.89, 37-42 weeks of gestational age was 2.8 [AHR = 2.8; 95% CI (1.47-5.36], premature rapture of membrane (PROM) was 2.33 [AHR= 2.33; 95% CI (1.27-4.28)], duration of labor 2.44 [AHR = 2.44; 95% CI (1.275-4.67)] labor onset 3.25 [AHR = 3.25; 95% CI (1.68-6.28)] were predictors. *Conclusion and Recommendation:* The incidence of jaundice was relatively high in current study than the result of the prior one. Male neonates, prolonged duration of labor, gestational age, premature rapture of membrane (PROM) and labor onset were the significant predictors. Henceforth, an effort has to be considered to reduce the incidence of newborn jaundice via enlightening newborn care and timely interfering meant for neonates with premature rapture of membrane and birth at a elongated period of time as well as the newborn born from induced labor.

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Keywords

Neonatal Jaundice, Incidence, Predictor, Ameya Primary Hospital, Ethiopia

1. Introduction

Jaundice is one of the greatest known medical problems producing newborn readmission throughout the neonatal time [1]. It is an avoidable and curable clinical problem, nevertheless letting untreated can cause newborn death. The incidence of jaundice amongst neonates during the initial week of their life is high [2]. Newborn jaundice is the greatest joint cause of readmission for babies during first 28 days [3].

Interruptions in presentation or in the beginning of its treatment could cause in jaundice difficulties and death [4]. Regardless of the existence of hazard influences at natal in most cases, the illness also tends to be one of the principal reasons of readmissions during first 28 days [5].

Internationally 2.3 million kids deceased in the first months of file in 2023, approximately 63000 neonatal deaths every day, newborn death secondary to jaundice problems, around 75% of neonatal death happened in South Asia and sub-Saharan Africa [6]. In Ethiopia, neonatal death and disease are amongst the maximum in the world, on which greater than one- third of infant demise happens in the first month [7]. In Sustainable Development Goal 3, States have committed to lessening the mother death ratio (from currently 216) to fewer than 70 per 100,000 live births between 2015 and 2030. So, addressing present points of mother and newborn mortality in low and middle-income countries is a worldwide precedence by 2030 [8].

The occurrence of newborn jaundice in Nepal was 29.3 per 1000 live births [9]. When we come with the load of jaundice, around 7% to 13% of entire neonatal demises in Bangladesh were accounted for by jaundice [10] of the whole neonatal death in Bangladesh, 78% was happening throughout the initial week of their life [10]. Jaundice was one of the greatest known causes of newborn death and responsive for 6.7% of newborn death in Ghana [11]. In Ethiopia, of the overall demise of neonates at Ayder, about 98.3% happened throughout the initial week of their life [12] also at public Hospitals of the Somali Regional State in Eastern Ethiopia, neonatal death was 18.6%, comparing to a rate of 186 per 1000 live births [13]. In Dil Chora Referral Hospital, Dire Dawa City, Ethiopia, the investigation revealed that neonatal mortality was 11.4% [14].

The predictors of newborn jaundice were categorized as neonatal, maternal, and medical factors and obstetric factors [15]. Gestational age, sex, birth weight, prolonged labor, and primiparity, normal and induced delivery, little Appearance Pulse Grimace Response Activity Respiration (APGAR) score, and birth asphyxia, duration of labor, many pregnancies, and vacuum removal were significantly linked with neonatal jaundice [15-17]. Moreover, to the above ABO and Rh incompatibility, sepsis, and low maternal educational status, and maternal O blood group were the significant predictors of newborn jaundice [15, 17, 18].

Different guideline and training were developed and given to improve the newborn intensive care ward reduce neonates' illness and mortality. Despite implementation of different guidelines and improving services the neonate's mortality was high in Ethiopia [19].

Many researches were carried out in diverse portions of Ethiopia on neonatal jaundice by using different study design. However, there was a limited study on incidence and its predicators of Neonatal Jaundice among Admitted Neonates at Ameya Primary Hospital, South West Shoa Zone, Ethiopia. Therefore, current research aims to discourse this gap by using a retrospective follow-up research design amongst Admitted Neonates at Ameya Primary Hospital, South West Shoa Zone, Ethiopia.

2. Methods and Materials

2.1. Study Area and Study Period

The research was conducted at Ameya primary Hospital, in South West Shoa Zone, Ethiopia. It is situated to 144 km to the south of Addis Ababa. Southwest Shoa Zone encompassed five government hospitals named Tullu Bollo General Hospital, Waliso General Hospital, Ameya Primary Hospital, Bantu Primary Hospital, and Leman Primary Hospital, and one non-government hospital called Lukas Catholic Hospital which is institute in Waliso, the capital city of the South West Shoa Zone. It also has 54 health centers, 264 health posts, 72 private clinics, 19 private pharmacies and 28 drugs store. The study was conducted at Ameya primary hospital. Last three year's neonatal admission were 435. The research was done from July one, 2022 - July one, 2024.

2.2. Study Design

A Retrospective follow-up study design was employed.

Source Population: All neonates admitted to the neonatal intensive care ward of Ameya primary Hospital were the source population. Entire neonates admitted to the intensive care ward of Ameya primary Hospital from July one, 2022 - July one, 2024 were the research population.

2.3. Eligibility Criteria

Inclusion Criteria: All neonates admitted to the neonatal intensive care ward of Ameya primary Hospital were included in the study.

Exclusion Criteria: Medical records which is inadequate information was excluded from the investigation.

2.4. Sample Size Determination

The sample size was calculated by using single proportion population formula used for the first specific objective, by considering of a 95% confidence level through a marginal error of 5%, The percentage of women satisfaction with immediate postnatal care was 42.3% (0.423), based on a prior study done in Jimma Medical Center, Jimma, South West Ethiopia [20].

$$n = \frac{(Z\alpha/2)^2 \times P\,(1-p)}{d^2}$$

$$n = \frac{(Z\alpha/2)^2 \times P\,(1-p)}{d^2} = \frac{1.96^2(0.423 \times 0.577)}{0.05^2} = 375$$

By adding 10% *(37)* rates of withdraw and loss to follow-up the final sample size required used for the quantitative research was *414*.

To determine the sample size for the second objective different kinds of literature were reviewed to choose the variables, and at that point the sample size was calculated by means of in view of the considering of significance level as (1-alpha) 95%, Power (1-beta) 80, Ratio of unexposed to exposed in sample. The sample size was determined by double population proportion formula for duration of labor and sex of neonates variables [15] by means of a double population proportion formula for analytic cross-sectional in Epi info software version 7.2.5 (see Table 1).

Table 1. *Sample size calculation by Epi info software version 7.2.5.*

Variables	CI 95%	Power 80%	P	HR	Sample Size with 10% withdraw and loss to follow-up	Reference
Duration of labor	95%	80%	13.04	3.5	90	[15]
Sepsis	95%	80%	15.38	2.6	130	[15]

Key: P: Proportion of unexposed with the outcome of interest, HR: Hazard ratio

By comparing all sample size, large sample was taken; thus, the final sample size used for this research was 414.

Sampling Technique: In Ameya primary Hospital, there were 476 calculated number of neonates admitted to NICU ward throughout the research time. Then, 414 neonates were selected from 476 by first simple random sampling methods.

2.5. Operational Definitions

Neonate: An infant from delivery to 28 days of age [19].

Jaundice: Defined as it is the yellow staining of the skin and conjunctiva produced by deposition of bilirubin secondary to the bilirubin level in the blood and identified by a physician [21].

Event: Neonates who had jaundice until discharge secondary to recovery or/and referred to the pediatric unit/referred to other hospital, the consequence of separate study subject was classified into censoring or event (Jaundice) and events coded as=1.

Censored: Neonates who had no jaundice up to discharge due to recovery or/and moved to the pediatric unit/referred to other hospital and censor code as=0.

Data Collection Instrument: A Structured tools was adapted later rereading diverse types of literature [15, 20, 16, 18]. The questionnaire consisted of Socio-demographic characteristics, neonates correlated features, and mother associated features.

Data Collection Technique: The data was gathered via a pre-tested structured research tool. The data was gathered by three Degree nurses and overseen by one MPH.

2.6. Data Quality Control

To guarantee the value of questionnaires, tools was adapted from correlated studies, pilot study done on twenty of the research participants (20) at Bantu primary Hospital. The gathered data was entered to EpiData version 4.62 and transferred to STATA version 14.

The data gatherers and superintendents were enlisted out of employees of the study hospitals to diminish bias and one day orientation was given for data gatherers and overseers concerning data gathering process, research tools, the aim of study, and ethical consideration. At the end of separate day, questionnaires were reread and crisscross meant for completeness by the overseers, and improvements were made.

The gathered data were crisscrossed for completeness, via the investigator and supervisor beforehand data entry into the software and each questionnaire accepted to enter the application for analysis was correctly coded, and given a specific Identification number.

2.7. Data Processing and Analysis

Data were entered into Epi data 4.62 software to diminish mistakes, to crisscrossed double data entered and form skipping lesion. Outlier and missed data were patterned prior to data analysis by running descriptive after exported to STATA version 14.

Descriptive analysis (like frequencies, and percentages) too inferential analysis were conducted. The bivariable and multivariable cox-proportional hazard regression model analyses were done. The Kaplan- Meier survival graph was done to guess the failure time of Neonatal intensive Care ward admission to discharge and/or having jaundice. A Log rank test was used to relate the survival curves between the categorical studies variables. The overall global test of full cox model was crisscrossed for proportional hazard assumption and it was fulfilled (p-value = 0.094) because it is greater than 0.05. All independent variable met the proportional-hazard assumption. The goodness of fitting of the model was also done by means of the Cox-Snell residual test and its results presented that the model was acceptable: the hazard function follows the 45 °closed to the baseline.

Bivariable analysis, the consequence variable (Jaundice) and independent variables were entered into the Cox-proportional hazard regression model to choose significant variables for the multivariable Cox-proportional hazard regression model. So, variables having a "p-value" ≤ of 0.25 in the bi-variable analysis were transferred into the multivariable cox-proportion regression model.

In the multivariable, Cox-proportional hazard regression model, variables with "p-values" <0.05 were considered as statistically significant predictors. Adjusted relative risk with their 95% confidence intervals and p-values was used to measure the strength of association and identify statistically significant predictors of neonatal jaundice. The Findings were stated using text, tables, and charts.

3. Results

In current study 414 sample size was calculated, and 407 neonates had completed information giving the response rate of 98.3%. Seven questionnaires were incomplete and excluded from the analysis.

3.1. Neonatal Related Factors

The results of present study indicated among 414 respondents, 38 (19.2%) of died and 160 (80.8%) of censored neonates were male with incidence density rate of 29.48 per 1000. Twenty seventeen (17.8%) of died and 125 (82.5%) of censored neonates` five minutes APGAR score was less than six with incidence density rate of 27.38 per 1000. Twenty-nine (9.1%) of died and 288 (90.9%) of censored neonates were had no neonatal sepsis with incidence density rate of 14.18 per 1000 (see Table 2).

Table 2. *Neonatal factors.*

Variables	Variables Category	Outcome		Total, N (%)	NDO	IDR per 1000 NDO
		Died, N (%)	Censored, N (%)			
Genders of neonates	Male	38(19.2%)	160(80.8%)	198(48.6%)	1289	29.48
	Female	14(6.7%)	195(93.3%)	209(51.4%)	1295	10.81
Gestational age	<37	38(19.2%)	160(80.8%)	198(48.6%)	1247	30.47
	37-42	14(6.7%)	195(93.3%)	209(51.4%)	1337	10.47
Birth weight (kg)	<2.5	51(14.3%)	305(85.7%)	356(87.5%)	2226	22.91
	=>2.5	1(2.0%)	50(98.0%)	51(12.5%)	358	2.79
Five-minute APGAR score	≤6	27(17.8%)	125(82.2%)	152(37.3%)	986	27.38
	7=10	25(9.8%)	230(90.2%)	255(62.7%)	1598	15.64
Family history of jaundice	No	28(11.3%)	219(88.7%)	247(59.7%)	1525	18.36
	Yes	24(14.4%)	143(85.6%)	167(40.3%)	1059	22.66
Birth trauma	No	33(10.1%)	293(89.9%)	326(80.1%)	2065	15.98
	Yes	19(23.5%)	62(76.5%)	81(19.9%)	522	36.39

Variables	Variables Category	Outcome		Total, N (%)	NDO	IDR per 1000 NDO
		Died, N (%)	Censored, N (%)			
Neonatal sepsis	No	29(9.1%)	288(90.9%)	317(77.9%)	2045	14.18
	Yes	23(25.6%)	67(74.4%)	90(22.1%)	539	23.54

Keys: N = number, % = percent, NDO = neonatal-day observed, IDR = Incidence density rate

3.2. Maternal Related Factors

The results of current research revealed among 414 neonates, 31(17.6%) of died and 145(82.4%) of censored neonates were born from multiple mothers in parity with incidence density rate of 28.23 per 1000. Thirty-one (27.9%) of died and 80(72.1%) of censored neonates delivered from moms who had Premature rapture of membrane (PROM) with incidence density rate of 42.82 per 1000. Thirty-five (10.7%) of died and 293(89.3%) of censored neonates were delivered from moms who had ANC follow up with incidence density rate of 16.67 per 1000 (see Table 3).

Table 3. *Maternal factors.*

Variables	Variables Category	Outcome		Total, N (%)	NDO	IDR per 1000 NDO
		Died, N (%)	Censored, N (%)			
Blood group	A	5(10.0%)	45(90.0%)	50(12.1%)	321	15.58
	B	4(3.3%)	119(96.7%)	123(29.7%)	757	5.28
	AB	11(8.8%)	114(91.2%)	125(30.2%)	760	14.47
	O	32(27.6%)	84(72.4%)	116(28.0%)	746	43
RH factor	Negative	6(30.0%)	14(70.0%)	20(4.8%)	114	52.63
	Positive	46(11.7%)	348(96.1%)	394(95.2%)	2470	18.62
Parity	Single	21(9.1%)	210(90.9%)	231(56.8%)	1486	14.13
	Multiple	31(17.6%)	145(82.4%)	176(43.2%)	1098	28.23
Premature rapture of membrane	No	21(7.1%)	275(92.9%)	296(72.7%)	1860	11.29
	Yes	31(27.9%)	80(72.1%)	111(27.3%)	724	42.82
ANC follow-up	No	17(21.5%)	62(78.5%)	79(19.4%)	485	30.05
	Yes	35(10.7%)	293(89.3%)	328(80.6%)	2099	16.67
Gestational diabetes mellitus	Yes	33(12.1%)	240(87.9%)	273(65.9%)	1704	19.36
	No	19(13.5%)	122(86.5%)	141(34.1%)	886	21.59
Mode of delivery	Spontaneous vaginal delivery	24(10.6%)	203(89.4%)	227(54.8%)	1395	17.2
	Instrumental delivery	20(14.2%)	121(85.8%)	141(34.1%)	877	22.8
	caesarean section	8(17.4%)	38(82.6%)	46(11.1%)	312	25.64
Gestational hypertension	No	48(12.1%)	348(87.9%)	396(95.7%)	2479	19.36
	Yes	4(22.2%)	14(77.8%)	18(4.3%)	105	38.09
Obstetrics complication	Yes	44(12.9%)	298(87.1%)	342(82.6%)	2139	20.57
	No	8(11.1%)	64(88.9%)	72(17.4%)	445	17.97

Variables	Variables Category	Outcome		Total, N (%)	NDO	IDR per 1000 NDO
		Died, N (%)	Censored, N (%)			
Duration of labor	Prolonged	28(36.4%)	49(63.6%)	77(18.9%)	478	58.57
	Normal	24(7.3%)	306(92.7%)	330(81.1%)	2106	11.39
Onset of labor	Spontaneous	24(7.5%)	298(92.5%)	322(79.1%)	2069	11.6
	Induced	28(32.9%)	57(67.1%)	85(20.9%)	515	54.37

Keys: N = number, % = percent, NDO = neonatal-day observed, IDR = Incidence density rate

3.3. Incidence Rate of Neonatal Jaundice

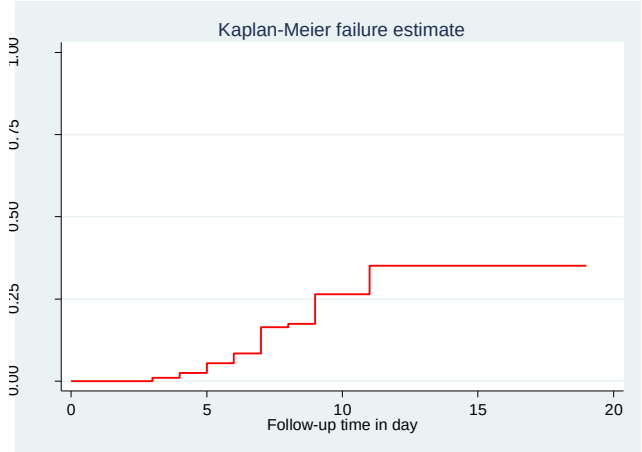

Figure 1. *Kaplan Meier survival estimate of cumulative failure status of the jaundice neonates during follow- up time at Ameya Primary Hospital, Ethiopia, 2025.*

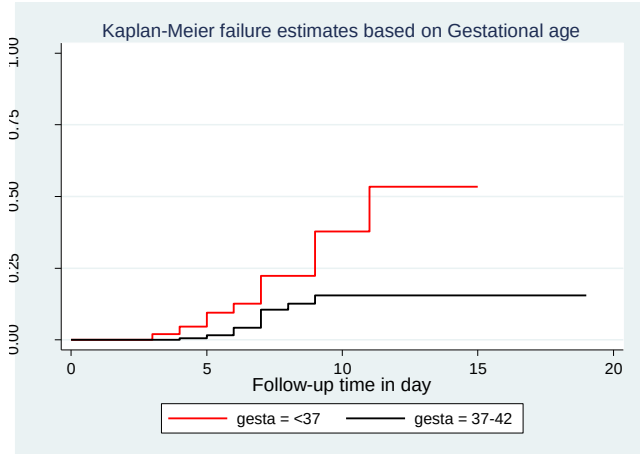

Figure 2. *Kaplan Meier survival estimate neonatal jaundice based on gestational age at Ameya Primary Hospital, Ethiopia, 2025.*

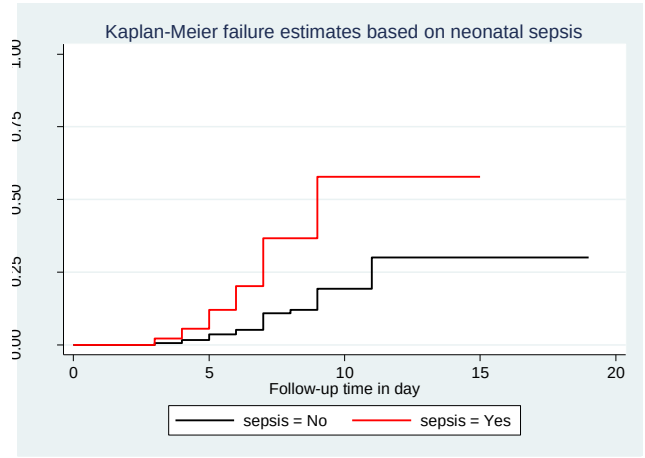

Figure 3. *Kaplan Meier survival estimate neonatal jaundice based on neonatal sepsis at Ameya Primary Hospital, Ethiopia, 2025.*

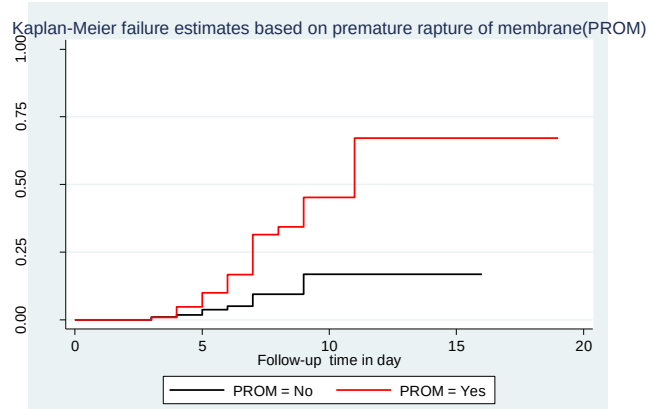

Figure 4. *Kaplan Meier survival estimate neonatal jaundice based on PROM at Ameya Primary Hospital, Ethiopia, 2025.*

In present study, neonates had a follow-up period ranging from 1 day to 28 days throughout their admission time. In the follow-up, around 52 neonates were developing jaundice. The overall time at risk 407 neonates was 2584 person days through an incidence rate amongst admitted neonates was 20.12 per 1000 neonate days observation (95% CI: 15.33-26.41).

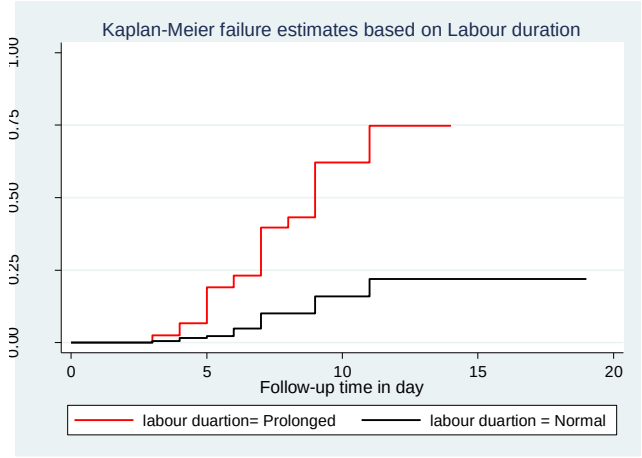

Figure 5. *Kaplan Meier survival estimate neonatal jaundice based on labor duration at Ameya Primary Hospital, Ethiopia, 2025.*

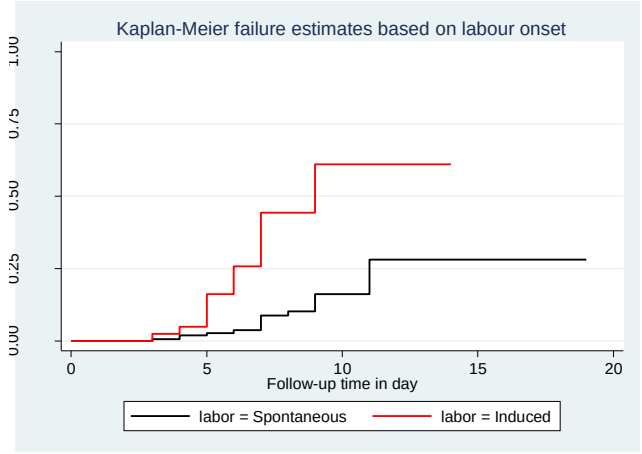

Figure 6. *Kaplan Meier survival estimate neonatal jaundice based on labor onset at Ameya Primary Hospital, Ethiopia, 2025.*

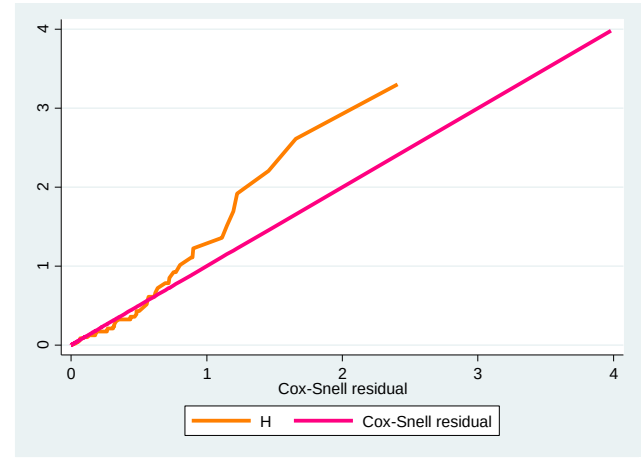

Figure 7. *Test of goodness of fitting of the model by Cox-Snell residual Nelson-Alen cumulative hazard plot.*

Table 4. *Comparisons of jaundice amongst diverse predictors variables via the log-rank test.*

Variables	Log-rank (χ^2)	p-Value
Genders of neonates	15.42	0.0001
Gestational age	13.01	0.0003
Birth weight (kg)	10.67	0.0011
Five-minute APGAR score	4.44	0.0351
Birth trauma	7.56	0.0060
Neonatal sepsis	17.87	0.00001
Parity	6.74	0.0094
Premature rapture of membrane (PROM)	20.38	0.00001
ANC follow-up	5.97	0.0146
Duration of labor	32.17	0.00001
Onset of labor	31.48	0.00001

3.4. Predictors of Neonatal Jaundice

The findings of current research revealed gender of neonates, gestational age, birth weight, five-minute APGAR score, birth trauma, parity, premature rapture of membrane (PROM), ANC follow-up, duration of labor and labor onset were distinguish as candidate variables used for multivariable Cox regression analysis of neonatal jaundice. Afterwards controlling probable confounding variables by multivariable Cox regression analysis, gender of neonates, gestational age, premature rapture of membrane (PROM), duration of labor and labor onset were statistically significant predicators of newborn jaundice at a p-value <0.05.

The result of current research indicated the relative risk of newborn jaundice among male neonates was 2.43 [AHR= 2.43; 95% CI (1.21-4.89)] times higher when compared with those female neonates. The risk rate of having neonatal jaundice among neonates who were born at 37-42 weeks of gestational age was 2.8 [AHR = 2.8; 95% CI (1.47-5.36)] times higher as related with those who were delivered at 37 weeks of gestational age. The hazard rate of neonatal jaundice among newborn who were delivered from mother who had premature rapture of membrane (PROM) was 2.33 [AHR= 2.33; 95% CI (1.27-4.28)] times higher when related with neonates who were delivered from mother who had no premature rapture of membrane (PROM).

In addition, the hazard rate of having neonatal jaundice among neonates whose moms had duration of labor of prolonged was 2.44 [AHR = 2.44; 95% CI (1.275-4.67)] times higher as related with neonates whose mother had duration of labor of normal. The relative risk of newborn jaundice among neonates whose mother labor induced 3.25 [AHR = 3.25; 95% CI (1.68-6.28)] times higher related with those neonates

whose mother labor start by itself.

Table 5. *Predicators of newborn jaundice amongst admitted neonate at Ameya Primary Hospital, Ethiopia, 2025.*

Variables	Variables Category	Outcome		CHR (CI 95%)	P-value	AHR (CI 95%)	P-value
		Died, N (%)	Censored, N (%)				
Genders of neonates	Male	38(19.2%)	160(80.8%)	3.365(1.73-6.55)	0.0001	2.43(1.21-4.89)	0.013*
	Female	14(6.7%)	195(93.3%)	1		1	
Gestational age	<37	38(19.2%)	160(80.8%)	1		1	
	37-42	14(6.7%)	195(93.3%)	2.89(1.56-5.32)	0.0003	2.8(1.47-5.36)	0.002*
Birth weight (kg)	<2.5	51(14.3%)	305(85.7%)	9.14(1.26-66.21)	0.0011	4.85(0.66-35.9)	0.122
	=>2.5	1(2.0%)	50(98.0%)	1		1	
Five-minute APGAR score	≤6	27(17.8%)	125(82.2%)	1.79(1.04-3.10)	0.0351	1.65(0.92-2.97)	0.092
	7=10	25(9.8%)	230(90.2%)	1		1	
Birth trauma	No	33(10.1%)	293(89.9%)	1		1	
	Yes	19(23.5%)	62(76.5%)	2.3(1.31-4.04)	0.0060	0.86(0.43-1.72)	0.668
Neonatal sepsis	No	29(9.1%)	288(90.9%)	1		1	
	Yes	23(25.6%)	67(74.4%)	3.5(2.01-6.08)	0.00001	1.79(0.88-3.66)	0.110
Parity	Singe	21(9.1%)	210(90.9%)	1		1	
	Multiple	31(17.6%)	145(82.4%)	2.06(1.19-3.6)	0.0094	1.24(0.66-2.32)	0.508
Premature rapture of membrane (PROM)	No	21(7.1%)	275(92.9%)	1		1	
	Yes	31(27.9%)	80(72.1%)	3.55(2.04-6.18)	0.00001	2.33(1.27-4.28)	0.006*
ANC follow-up	No	17(21.5%)	62(78.5%)	2.14(1.2-3.82)	0.0146	0.86(0.44-1.69)	0.658
	Yes	35(10.7%)	293(89.3%)	1		1	
Duration of labor	Prolonged	28(36.4%)	49(63.6%)	5.1(2.95-8.79)	0.00001	2.44(1.275-4.67)	0.007*
	Normal	24(7.3%)	306(92.7%)	1		1	
Onset of labor	Spontaneous	24(7.5%)	298(92.5%)	1		1	
	Induced	28(32.9%)	57(67.1%)	5(2.9-8.63)	0.00001	3.25(1.68-6.28)	0.0001*

Key: - *= statistically significant, 1 = Reference, COR = Crude odd ratio, AOR = Adjusted odd ratio, CI = confidence interval

4. Discussion

Current research aimed to assess incidence and its predictors of neonatal jaundice amongst neonates admitted to newborn intensive care ward of Ameya Primary Hospitals. These findings verified that the incidence density amongst admitted neonate in present study was 20.12 per 1000 neonate days observation (95% CI: 15.33-26.41). This incidence rate of neonatal jaundice at Ameya primary Hospital was medium as related to the prior studies at Debre Markos town, North Ethiopia (4.5 per 1000) [15]. The possible reason for these discrepancies might be because of variance in study period, sample size, also research setting.

Nevertheless, the finding of this research was lower than research done at Nepal was 29.3 per 1000 [9]. The probable reason for these discrepancies could be because of variance in research population, study area, and sociocultural, research period, and sample size.

The results of this study showed being male neonates had 2.43 times higher risk of having newborn jaundice as related to their female respondents. This result was similar with studies conducted at Debre Markos town, North Ethiopia [15]. These results could elucidate that male babies have comparatively immature liver, which could not be able to

process all the bilirubin molded as of red blood cells.

Accordingly, current research found that risk rate of having neonatal jaundice amongst neonates who were born at 37-42 weeks of gestational age was 2.8 times higher as related with those who were born at 37 and less weeks of gestational age. This was like to the prior research done at Sidama Region, Sidama, Ethiopia [16]. This discrepancy could be due to the study area and the level of women's knowledge to start early breast feeding and birth complication.

The present research showed the relative risk of neonatal jaundice amongst neonates who were delivered from moms who had premature rapture of membrane was 2.33 times higher when related with neonates who were delivered as of moms who had no premature rapture of membrane. This may be due to the fact that premature rapture of membrane prolong labor and increases risk of birth complication that put neonates unable to suck.

The result of current research showed the risk rate of developing newborn jaundice amongst neonates whose mother had duration of labor of prolonged was 2.44 times higher as compared with neonates whose mother had duration of labor of normal. This was similar with study conducted in at Dessie Town public hospitals, Amhara region, Ethiopia [22], and at Sidama Region, Sidama, Ethiopia [16]. This could be due to as labor delays the neonates may be exposed to diverse birth complication such as scalp harm (cephalhematoma) these situations are identified as predictors of newborn jaundice by increasing bilirubin making.

The hazard rate of newborn jaundice amongst neonates whose mother labor induced 3.25 times higher related with those neonates whose moms labor start by itself. This result can be interpreted as be exposed to different birth complication which increases neonatal jaundice.

5. Limitation of the Study

Current study was conducted using a retrospective follow-up study design, so some predictors variables was lost.

The research was done only at single hospital.

6. Conclusion

The result of current investigation was concluded that the incidence of newborn jaundice was relatively high some researches done in Ethiopia. Gender of neonates, gestational age, premature rapture of membrane (PROM), duration of labor and labor onset were predicators of newborn jaundice. A determination has to be concerned to reduce the incidence of newborn jaundice through enlightening newborn care and timely interfering for neonates with premature rapture of membrane and born at an extended duration of time as well as the neonates delivered from induced labor

Abbreviations

ANC	Antenatal Care
NICU	Neonatal Intensive Care Unit
PROM	Premature Rapture of Member

Author Contributions

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Ethical Approval Statement

1) This study was approved by Ameya Primary Hospital.
2) This study was conducted according to institution guideline and regulation.

Data Availability Statement

The corresponding author is willing to provide the dataset that was used in this study based upon reasonable request.

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There was no fund to conduct this study.

Conflicts of Interest

The authors declare no conflicts of interest.

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