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Original Article

Outcomes of Premature neonates Less Than 35 weeks in Low Income Countries, Case of Democratic Republic of Congo

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Abstract

Background: Prematurity is cause of perinatal mortality and morbidity. Mortality is higher in newborns under 32 weeks in almost sub-Saharan African countries. **Aim of work:** To determine factors associated with preterm mortality less than 35 weeks of gestational age. **Patients and methods:** A retrospective study was conducted at Monkole Hospital on date base of preterm babies, born during the period from January 1, 2018 to December 31, 2021. **Results:** The study included 398 hospitalised preterms. The prevalence of prematurity was 8.3%, 220 (55.6%) were female preterms and 176 (44.4%) were males, with a sex ratio of 1.25. Their average weight was 1482 + 434 g. Caesarean sections were induced in 47% of cases (186). Central cyanosis was present in 32.1% (127), the majority was less than 28 weeks. The rate of antenatal steroid use was 45% (75/167). Mortality rate was higher in preterm infants less than 28 weeks. The rate was 80.1% at 26 weeks, 69.1% at 27 weeks and 56.5% at 28 weeks. A multivariate logistic regression analysis noted that the mortality of preterm infants decreased with increasing gestational age (OR= 0.544, 95% CI: 0.450-0.659, p=0.000). Morbidity was associated with the absence of antenatal corticosteroid therapy (OR = 2.768, 95% CI: 1.071-7154, p=0.036), absence of Continuous Positive Airway Pressure CPAP use (OR= 0.259, 95% CI: 0.109-0.619, p=0.002) and with transfer (OR = 0.338, 95% CI: 1.470-5.534, p = 0.002). **Conclusions:** Prematurity is one of the major causes of neonatal mortality especially in developing countries. The absence of antenatal corticosteroid therapy and non-use of CPAP increases the mortality of premature babies in this study.

Key words: Prematurity , mortality, antenatal corticosteroid, CPAP

Introduction

Premature birth remains the leading cause of perinatal morbidity and mortality. An estimated 14.9 million preterm babies were born in 2010, which represented 11.1% of all live births worldwide, 5% in Europe, 18% for Africa [1,2] and 11.7% for the United States of America [3]. The main causes of early death during the neonatal age are serious complications associated with prematurity [1]. In almost every African country, mortality is higher in newborns under 32 weeks [1,4,5].

Democratic Republic of Congo (D.R.C.) has a population of more than 80 million people. The neonatal mortality rate was 97 per 1000 births in 2007 and 58 per 1000 births in 2013-14 [6]. The gross domestic product per inhabitant is 720 US dollars per year [7]. The management of prematurity is limited in general, specially respiratory management with absence of essential respiratory interventions, such as CPAP, the lack of surfactant administration [1,8] and the limited number of incubators for most neonatology units and parenteral nutrition. In the majority of African Countries, the accessibility to respiratory care interventions for premature babies in 2020 was estimated at 63% for CPAP and only 33% for surfactant therapy.

Taking into account the recommendations of the World Health Organization (WHO) [1], interventions such as antenatal corticosteroid therapy (ACS), the use of CPAP and surfactant are among the most effective means for improving the management of premature babies [1,5,9].

Aim of the Work

The interest of this study was to determine the factors associated with the mortality of premature babies born before 35 weeks of gestational age followed at Monkole Hospital during the period from January 2018 to December, 2021.

Methods

The study was conducted at neonatal intensive care unit (NICU), Monkole

hospital. It has a capacity of 12 incubators. Four- hundreds newborns are hospitalized per year, with 100 premature babies admitted annually. The associated maternity has an average of 1200 births per year. Monkole hospital takes care of an urban and peri-urban destitute population of Kinshasa. It provides care, respectively, for a health area of nearly 500,000 inhabitants. It has a better facility than most other units in the Democratic Republic of Congo.

The unit has intensive care interventions: CPAP and mechanical ventilation with a Siare device n°Siaretron 4000 and support for a variety of neonatal patients, especially with neonatal infection, jaundice and respiratory distress syndrome. Premature newborns are admitted for thermoregulation check and are placed in an incubator; Respiratory distress is controlled with non-invasive ventilation strategy through CPAP for infant's age ≥ 26 weeks. On admission, most premature infants with respiratory distress are controlled with CPAP with the positive expiratory pressure at 4-7 cmH2O. The pressure should be modified taking into account the tolerance. The preterm with age ≥ 32 weeks with respiratory distress syndrome can go on CPAP. Caffeine is administered < 31 weeks age, dose of 20 mg/kg, the first day, and then 5 mg/kg up to 36 weeks. The antibiotic is systematically administered at those with less than 33 weeks, progressive feeding based on breast milk is started after 48 hours, if no respiratory distress, with an excellent tolerance after the test, and otherwise they receive 10% glucose solution with electrolytes.

A retrospective study based on neonatal data was conducted, including premature newborns less than 35 weeks of gestational age, admitted to the neonatology unit of the Monkole hospital center during the period from January 1, 2018 to December 31, 2021.

Study design

This study included newborns from 25 weeks +3 days to 35 weeks +1day. We

evaluated clinical parameters: Apgar score <7 at 5th minute, oxygen saturation <95% after 10 minute, presence of cyanosis, transfer after birth, antenatal corticosteroid, blood glucose at birth, CPAP use, evolution and morbidity (sepsis, apnea, respiratory distress).

Ethical considerations

This study was approved from The Ethics Committee of Monkole hospital, Kinshasa, D.R Congo.

Statistical analysis

All statistical analyzes were performed using SPSS Software 16.0 (SPSS10). The variables are presented in the form of means, medians and standard derivations. Multivariate analyzes were performed separately using logistic regression to analyze risk factors for mortality and morbidity in preterm infants. GA, gender, oxygen saturation, cyanosis, blood glucose, transfer, steroid use and CPAP were included in the analysis.

$P < 0.05$ was considered statistically significant.

Results

During the study period there were 398 hospitalized premature newborns. Prevalence of prematurity was 8.3%, 398 premature newborns out of a total of 4235 hospitalized newborns. 220 (55.6%) were female and 176 (44.4%) males for a sex ratio of 1.25. Their average weight was 1482 $\pm$ 434 g, an average oxygen saturation at the 5th minute of 92.7 $\pm$ 7.3%, a temperature of 34.4 $\pm$ 2.0°C and a blood glucose at birth of 98, 5$\pm$ 83.6 mg/dl (Table 1a & b).

Caesarean section was performed for 47% of cases (186), 4.3% for premature babies born at 26 weeks, it increased by age. 32.1% (127) Newborns had cyanosis at birth, which was higher under 28 weeks, 85.7% at 26 weeks, 66.7% for 27 weeks.

The rate of antenatal steroid use was 45% (75/167) for premature infants under 32 weeks, it also increased with age, 23.8% at 26 weeks and 57.1% at 31 weeks. The overall mortality rate was 23.5%, 66 (16.7%) neonates had died before 7 days

of life, only 27 (6.8%) after 7 days of life. The mortality rate was higher under 28 weeks, respectively 80.1% at 26 weeks, 69.1% at 27 weeks and 56.5% at 28 weeks. (Table 2a&b)

A multivariate logistic regression analysis noted that the mortality of preterm infants decreased with increasing gestational age (OR= 0.544, 95% CI: 0.450-0.659, p=0.000), the absence of antenatal corticosteroid therapy (OR = 2.768, 95% CI: 1.071-7154, p=0.036), absence of CPAP use (OR= 0.259, 95% CI: 0.109-0.619, p=0.002), presence of cyanosis (OR= 0.190, 95% CI: 0.081-0.446, p=0.000) as well as oxygen saturation < 95% at birth (OR= 0.325, 95% CI: 0.151-0.698, p=0.004) (Table 3). Morbidity was associated with the notion of transfer OR = 0.338, 95% CI: 1.470-5.534, p = 0.002). (Table 4)

Discussion

The prevalence of prematurity and high mortality is partly associated, for low-resource countries with a low level of economic development, with the quality of medical equipment as well as a limited number of health workers [10, 11,12]. Neonatal nursing care was provided in 57% of settings and 21 countries reported having lower than 50 pediatricians and 12 countries had no neonatal specialists [13]. These countries are quite limited in the management of preterm infants under 28 weeks, these limits would result from the absence of adapted infrastructure (CPAP, incubators, respirators, etc.) and medication (non-use of surfactant) [9].

Our study found factors that were associated with neonatal mortality and morbidity: transfer after birth, gestational age, low Apgar score at 5 min, the presence of cyanosis associated with low oxygen saturation < 95%, and antenatal corticosteroid therapy. This study based on outcomes of premature infants with 26 to 35 weeks revealed poor prognostic factors for the survival of premature infants. Overall survival rate was 76.5% (303 newborns) with 23.5% for mortality. Taking into account the limit of coverage of prematurity before 28

weeks, the study had a survival rate of 43.5% at 28 weeks age, 29.9% at 27 weeks and 19.1% at 26 weeks. However in China, Xiang Yong Kong had a better survival rate 28% at 25 weeks, 84.8% at 26 weeks, 83.5% at 27 weeks, 87.4% at 28 weeks, 90.7% at 29 weeks and 93.9% at 30 weeks [10] and in Canada, data from the Canadian Neonatal Network (CNN) showed an improvement in survival with a significant decrease in the mortality rate for gestational age <29 weeks from 2006-2007 (14.7%) [14].

Isayama et al., on the other hand, compared data from the Japanese network with those from Canada for the years 2006–2008, the mortality rate for children under 25 weeks, 26–27 weeks, 28–29 weeks and 30– 32 weeks were respectively 27.1% vs 52.3%、9.6% vs 17.9% [15]. Tomo et al, in Brazil, had a mortality of 38.1% for age between 26 and 27 weeks, 18.4% for those aged 28-29 weeks and 7.3% for those whose age was between 30-32 weeks of amenorrhoea [16]. We think that the low use of antenatal corticosteroid therapy and non-use surfactant in our patients could have impact on the low percentage of survival less than 28 weeks age. 40% of these births under 32 weeks took place at primary care hospital or at home, this aspect seems to be a factor of poor prognosis [12].

Our study confirmed that the prenatal use of steroids can improve the health of premature babies. Our data revealed an association between the absence of antenatal corticosteroid therapy and the mortality of premature infants. Use of antenatal corticosteroid therapy is very low in Africa [17]. Travers Colm et al, in their metacentric observational study had also shown that exposure to a complete or partial course of antenatal corticosteroid therapy was associated with lower mortality in infants aged 22 to 28 weeks gestation [18]. In another study, they confirmed a lower rate of serious intracranial hemorrhage or death compared to unexposed infants for gestational age from 23 to 31 weeks [19].

Massawe et al, in Tanzania had noted a significant reduction in neonatal mortality: less than 18.9% [4].

Giving antenatal corticosteroids to mothers of preterm infants has been for a long time the standard of care in the health care setting for affluent countries and has consistently been associated with reduced neonatal mortality in preterm infants [20].

In the most recent Cochrane review, it is shown that the administration of antenatal corticosteroid therapy reduces perinatal mortality, severe morbidity and the need of respiratory assistance [21]. Glucocorticoids accelerate the development of pneumocytes 1 and 2, induce pulmonary beta receptors and are subsequently responsible for changes in alveolar structure, vascularization, and surfactant production. The increase in surfactant production will be achieved through both transcriptional and post-transcriptional mechanisms, increasing the rate of biosynthesis of phosphatidylcholine and fatty acids in the fetal lung [22]. Animal and human studies have shown that ACS also increases lung compliance and volume and increase response to exogenous surfactant therapy [13-15,23,24].

Due to the positive supporting evidence, the use of ACS in low-resource settings is essential to prevent complications of prematurity, which contribute significantly to neonatal mortality [10,11]. European consensus guidelines recommend antenatal corticosteroid therapy in all situations with threatened preterm birth before 34 weeks gestation or when active care of the newborn is planned [25]. In the D.R.C. the current guideline of the Congolese Society of Gyneco-obstetrics is to indicate antenatal corticosteroid therapy between 28 and 34 weeks [13]. National level guidelines on gestational age criteria for the use of ACS vary from country to country, ranging from 28 to 34 weeks or less than 34 weeks, following improvement neonatal intensive care, more and more low birth weights are surviving [2,10].

As emphasized in the WHO guidelines, ACS cannot be the only intervention; the preterm baby still needs minimal supportive care including monitoring of thermoregulation, feeding and if the age is <32weeks gestation they are more likely to need oxygen therapy and sometimes of respiratory assistance [1].

Positive pressure oxygenation an effective non-invasive method for the management of respiratory distress in premature baby, is associated with lower pulmonary morbidity [4]. This method is recommended in very low birth weight premature babies [11,26]. Our study found that lack of use NCPAP was associated with neonatal mortality (OR= - 0.259, 95% CI: 0.109-0.619, p=0.002). Several studies conducted on babies from developing countries have shown that the introduction of CPAP has improved the survival of premature babies. A study from Uganda assessing the impact of introducing bubble CPAP found that mortality was reduced in a 44% (OR: 0.56, 95% CI 0.36-0.86, P=0, 01) in b-CPAP treated preterm infants [27].

Similarly, a randomized controlled trial in Tanzania comparing b-CPAP to oxygen therapy for preterm infants for signs of respiratory distress, noted a 30% improvement in survival to discharge in infants treated with b-CPAP [4], while Massane in South Africa had noticed that not using CPAP would lead to an increase of 109 additional deaths [28]. A CPAP-based approach to respiratory support for preterm infants may reduce the invasiveness and duration of respiratory support, adverse effects and some non-respiratory adverse effects [3,4,25].

Transfer after birth or out-born is a risk factor associated with high mortality and severe morbidity as reported by Omoigberale, in Benin, who found a significantly higher rate of mortality among the out-born and in born babies (P-value<0.001) [29]. Dey, in Bangladesh, showed that due to hypothermia (P-value 0.007) and low

saturation (P-value 0.049) at admission, newborns in the group of out-born had died.

Prematures are being transported despite the lack of safe transport systems [30]. An Indian study confirmed that out-born admissions are a risk factor for neonatal sepsis and Vogel assures that this time might to allow the fetus to mature further before being born [31]. This protocol permits antenatal corticosteroid administration for lung maturation, and allows time for intra-uterine transfer to a hospital with neonatal intensive care facilities [32]. This protocol reduces infection transmission and risk mortality.

Although overall survival rates among preterm infants have been improved, sepsis remains to be a significant risk factor associated with long-term morbidity and mortality in this population [33-36].

Flannery, had in their study that three-quarters of all infected infants either died or survived with a major medical morbidity. The profoundly negative impact of EOS on very preterm infants highlights the need for novel preventive strategies [37]. Healthcare-associated infections are a major problem in newborn infants, considering their high morbidity, mortality, and long-term sequelae [38]. Septicemic infants, compared with non-septicemic infants, had significantly increased mortality (21% vs. 9%), longer hospital stay (98 vs. 58 days) and more serious morbidity, including severe intraventricular hemorrhage, bronchopulmonary dysplasia and increased ventilator days ($P < 0.001$) [39].

The cause of neonatal infections is not completely found, but the principal ways seem to be ascending intrauterine infection and fetal inflammatory response. The intense inflammatory response mediated by IL-1β, TNF-α, PAF, IFN-γ and IL-6, PGE_2 and MMP-1 and MMP-9 induces fetal membrane damage and rupture. Furthermore, preterm neonates have deficient innate and adaptive immune responses

characterized by reduced levels of IgG, opsonization and phagocytosis, as well as increased activation of Th1 cells in relation to Th2 cells [40].

Limitations

The strengths of this study were the care of newborns under 28 weeks and to determine factors associated with morbidity and mortality in developing countries. The weaknesses were: first, the study was done in only one equipped unit and on the other hand, the type of study: it would be interesting to make a prospective study with a view to ensuring the same care for the entire population, for example access to antenatal corticosteroid therapy.

Conclusions

Prematurity is one of the major causes of neonatal mortality, especially in developing countries. The absence of antenatal corticosteroid and the non-use of CPAP increase mortality of prematurity for this study. The use of these respiratory interventions has reduced mortality. These means could be applied in a systemic way by associating other interventions such as the use of surfactant.

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Author's contributions

We are part of pediatric team of Monkole hospital. G.K: contributed to prepare literature, research design and prepared the data base, assisted in data analysis and interpretation, wrote the manuscript after data analysis and revisions; as well as submitted final version. M.J: Contributed to prepare literature search and research design of study. B.C: Contributed to the literature search, research design and data acquisition; critically revised and interpretation of data. M.S: Contributed to the design and acquisition, analysis and interpretation of the data; participated at writing of manuscript, revised the manuscript; approved the submitted and final version; critically revised the

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Conflict of interest

The authors have no conflict of interests to declare.

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Table 1a: general characteristics of preterm babies

Item	**26**		**27**		**28**		**29**		**30**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
AG (weeks)	25,6	,8	27,0	0,0	28,0	0,0	29,0	0,0	30,0	0,0
Rea. time (minute)	6,0	2,2	6,2	2,0	8,	5,4	6,2	2,5	5,7	3,0
Birth Weight (grams)	670	116,4	916,2	83,4	1042,2	93,1	1086,5	88,2	1224,6	140,3
Apgar (5min.)	7,1	1,8	7,3	1,3	7,0	1,5	7,0	1,5	7,4	1,2
Apnea number	1,5	1,2	1,6	1,7	1,1	1,0	,4	,9	,8	1,4
Sat. O2 ,(%)	93,0	7,3	89,9	11,6	89,4	11,7	92,5	8,2	90,6	6,6
FC	139,3	24,7	140,6	17,4	141,3	22,0	146,5	17,4	149,1	13,3
FR	52,6	13,9	50,3	9,4	54,1	13,2	57,3	10,4	52,9	9,3
T° (°C)	34,1	1,4	34,6	1,4	35,1	1,3	35,4	1,5	35,4	,75
Glycemia (mg/dl)	122,3	98,2	157,1	142,5	136,8	144,6	111,6	78,6	79,9	39,1

AG: gestational age, Reanimation time at birth, Apnea number, Sat O2: oxygen saturation, FC: Heart rate, FR: respiratory rate T° : temperature, Glycemia

Table 1b : General characteristics of preterm babies

Item	31		32		33		34		35		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age (weeks)	31,0	0,0	32,0	0,0	33,0	0,0	33,9	,1	34,9	,14	31,7	2,81
Rea. time (minute)	6,3	3,0	5,6	2,1	4,9	2,1	6,0	2,5	6,4	2,7	6,2	2,9
Birth Weight (Grams)	1335,0	132,3	1487,3	252,2	1659,3	193,0	1793,4	279,0	2017,0	269,3	1482,5	434,3
Apgar at. 5min.	7,7	1,3	7,7	1,7	8,2	1,2	8,2	1,2	8,2	1,3	7,9	1,4
Apnea number	,4	,8	,3	1,1	,1	,5	,1	,5	,0	,14	,5	1,0
O2 Sat.(%)	91,7	9,4	96,1	3,1	95,3	5,1	96,5	3,6	96,4	3,1	92,7	7,3
FC	142,0	20,5	141,0	18,4	145,7	15,7	139,3	15,9	135,4	18,6	141,4	18,3
FR	55,3	12,3	58,8	14,2	55,8	10,4	54,4	11,2	54,2	14,2	54,8	11,9
T° (°C)	35,7	,9	35,6	1,0	36,0	,9	35,2	3,6	35,6	1,0	35,4	2,0
Glycemia (mg/dl)	94,7	66,4	98,6	92,8	78,6	32,0	96,4	85,9	71,4	23,9	98,5	83,6

AG: gestational age, Reanimation time at birth, Apnea number, Sat O2: oxygen saturation, FC: Heart rate, FR : respiratory rate, T°: temperature

Table 2a: Evaluation of mortality and mobidity of preterm associated with respiratory interventions

Gestationel ag (Weeks)	**26**	**27**	**28**	**29**	30
Number	21	30	23	21	15
Death (%) < 7	13 (61,9)	14 (53,2)	11 (47,8)	2 (9,5)	4 (26,7)
Death (%) ≥ 7	4(19)	5(16,9)	2(8,7)	4(19)	1(6,7)
Survival (%)	4 (19,1)	11 (29,9)	10 (43,5)	15 (71,5)	10 (67.6)
RDS	19 (90.5)	27 (90)	17 (73.9)	13 (61.9)	8 (53.3)
Cyanosis	18(85,7)	20(66,7)	13(56,5)	9(42,9)	7(46,7)
Apnea	12 (57.1)	11 (36.7)	10 (43.5)	2 (9.5)	3 (20)
Sepsis	5 (23.8)	13 (43.3)	8 (34.8)	11 (52.4)	8 (53.3)
PRM	8 (38.1)	16 (53.3)	6 (26.1)	9 (42.9)	3 (20)
NCPAP	19 (95,5)	23(76,7)	19(82,6)	18(85,7)	12(80,0)
ACS	5(76,2)	9(30,0)	7(30,4)	13(61,9)	9(60,0,)
Transferred	9(42,9)	12(40,0)	12(52,2)	4(19,0)	2(13,3)
Caesarean section	1(4.8)	11(36,7)	9(39,1)	8(38,1)	10(66,7)

AG : gestational age, , RDS: respiratory distress syndrome, NCPAP : Nasal Continuous Positive Airway Pressure,,ACS: Antenantal Corticosteroid, PRM :premature rupture of membranes

Table 2b: Evaluation of mortality and mobidity of preterm associated with respiratory interventions

Gestationel ag (Weeks)	**31**	**32**	**33**	**34**	**35**	**Total**
Number	57	26	63	92	48	396
Death (%) < 7 jours	11 (19,3)	2 (4,8)	3 (4.7)	5 (5,4)	1 (2.1)	66 (16,7)
Death (%) ≥ 7 jours	7(12,3)	0(0)	0(0)	3(3,3)	0(0)	27(6,8)
Survival (%)	39 (68,4)	23 (87,5)	60(95,3)	84 (91,3)	47 (97,9)	303 (76,5)
RDS	30 (52.6)	15 (57.7)	25 (39.7)	29 (31.5)	11 (22.9)	194 (49)
Cyanosis	21(36,8)	6(23,1)	17(27,0)	11(12,0)	5(10,4)	127(32,1)
Apnea	4 (7)	(3.8)	1 (1.6)	1 (1.1)	0 (0)	45 (11.4)
Sepsis	17 (29.8)	4 (15.4)	19 (30.2)	10 (10.9)	5 (10.4)	100 (25.3)
PRM	25 (43.9)	4 (15.4)	15 (23.8)	31 (33.7)	19 (39.6)	136 (34.3)
NCPAP	43(75,4)	12(46,2)	8(12,7)	10(10,9)	4(8,3)	168(42,4)
ACS	33(58,0)	9(34,6)	8(12,7)	5(5,4)	0(0)	98(24,7)
Transferred	16(28,1)	7(26,9)	15(23,8)	24(26,1)	6(12,5)	107(27,0)
Caesarean section	40(70,2)	16(61,5)	36(57,1)	37(40,2)	18(37,5)	186(47,0)

AG: gestational age, , RDS: respiratory distress syndrome, NCPAP : Nasal Continuous Positive Airway Pressure, ACS: Antenantal Corticosteroid, PRM :premature rupture of membranes

Table 3: Multivariate logistic regression analysis of severe morbidity risk factors

Factors	**p-value**	**OR**	**wald**	**95% CI**	**p**
Gestationel age	-,306	,084	13,255	,624 - ,868	0,000
Oxygen sat. 95%	-,358	,312	1,319	,379 – 1,288	0,251
Transfer	1,048	,338	9,600	1,470 – 5,534	0,002
Absence ACS	-,762	,386	3,893	,219 - ,995	0,049
Female gender	,323	,285	1,279	,789 – 2,415	0,258
No NCPAP use	-,139	,353	1,319	,436 – 1,737	0,693
Cyanosis	-,879	,374	5,515	,199 - ,865	0,19
Glycemia 150mg/dl	-,220	,328	,450	,422 – 1,526	0,502

ACS: absence of antenatal corticosteroid, oxygen saturation, transfer after birth, NCPAP: Nasal Continuous Positive Airway Pressure,

Table 4: Multivariate logistic regression analysis of mortality risk factors

Factors	Mortality				
	Bvalue	**OR**	**wald**	**95% CI**	**p-value**
Gestationel age	-,608	,097	39,231	,450 - ,659	0,000
Oxygen sat. 95%	-1,125	,390	8,309	,151 - ,698	0,004
Transfer	,239	,466	,264	,510 – 3,164	0,000
Absence ACS	1,018	,484	4,416	1,071 – 7,154	0,036
Female gender	-,420	,372	1,276	,317 – 1,362	0,259
No NCPAP use	-1,350	,443	9,294	,109 - ,698	0,002
Cyanosis	-1,659	,435	14,547	,081 - ,446	0,000
Glycemia 150mg/dl	-,544	,413	1,738	,258 – 1,303	0,187

ACS: absence of antenatal corticosteroid, oxygen saturation, transfer after birth,
NCPAP: Nasal Continuous Positive Airway Pressure,

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