



Predictors of Early (23-25 Weeks' Gestation) Versus Late (26-29 Weeks') Delivery among Very Preterm Infants (N=101) Born during 1998-2003 at a Tertiary Care Center in Karachi, Pakistan

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Abstract

We have published analyses on characteristics and predictors of survival among a cohort of very preterm infants. We decided to divide our dataset into early very preterm (23 to 25 weeks, n=13) and late very preterm (26 to 29 weeks, n=88) infants and study predictors of early delivery versus late. This was retrospective medical records review based study on very preterm infants (N=101, born ≥ 23 and ≤ 29 weeks of gestation) at Aga Khan University Hospital in Karachi, Pakistan during a 5.5-year period of 1998-2003. We conducted complete-case logistic regression model analysis (N=72) using variables of hemoglobin at delivery, maternal age, parity, presence or absence of complications, history of preterm delivery, vaginal bleed, steroids use, and year and time of birth. All variables were included in the model to mutually adjust for the confounding effect of each other and $P < 0.05$ was considered statistically significant. Statistical analysis showed none of the variables were significantly associated with early versus late delivery with only maternal age associated with a trend (one year increase associated with 15% reduced odds; Odds Ratio (OR) =0.85, 0.71–1.02; $P=0.07$). The ORs and P-values for other variables are also shown in Table 1. Multiple imputation for missing Hb variable conditional on all explanatory variables made maternal age significant ($P=0.045$), while all other variables remained non-significant. Youden's Index of Hb and maternal age with maximum sensitivity and specificity is 9.6 gm/dL and 25.00 years. There are no antenatal/intrapartum predictors identified. The pathophysiology of prematurity does not vary in this time window of gestation for a cut-off at 25 weeks.

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Objective

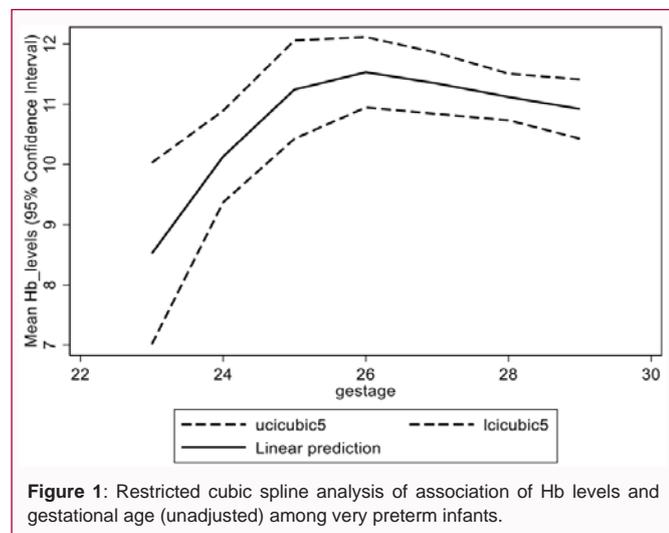
We have published previously analyses 1.2 on characteristics and predictors of survival among a cohort of very preterm infants. In this letter, we decided to divide our dataset into early very preterm (23 to 25 weeks, n=13) and late very preterm (26 to 29 weeks, n=88) infants and study predictors of early delivery versus late. This division was to study if there were any pregnancy-related risk factors for early delivery (at or earlier than 25 weeks of gestation) that could be a focus for intervention to delay preterm birth.

Study Design

This was retrospective medical records review based study on very preterm infants (N=101, born ≥ 23 and ≤ 29 weeks of gestation) at Aga Khan University Hospital in Karachi, Pakistan during a 5.5-year period of 1998-2003. Briefly, the detailed characteristics, clinical course, complications and incident survival proportions among infants and baseline data of their mothers were published in 2014 [1]. Furthermore, predictors of survival in both univariate (gestational age, birth weight and C-section) and multivariate models (gestational age only) were published in 2019 [2]. For this letter, we study predictors of early very preterm versus late delivery. We conducted complete-case logistic regression model analysis (N=72) using variables of hemoglobin at delivery, maternal age, parity, presence or absence of complications (hypertension, preeclampsia, eclampsia, pre-diabetes or gestational diabetes), history of preterm delivery, vaginal bleed (yes versus no), administration of steroids, and year and time of birth. All variables were included in the model to mutually adjust for the confounding effect of each other and $P < 0.05$ was considered statistically significant. No IRB committee existed at AKUH at the time of study but approval was taken from Dr. Nadeem F.

Table 1: Predictors of early (23-25 weeks') vs. late (26-29 weeks') gestation at delivery among very preterm infants (N=72).

Variable	Odds Ratio	95% confidence interval	P-value
Hb at delivery in g/dL (per unit increase)	0.65	0.36–1.17	0.15
Maternal age in years (per unit increase)	0.85	0.71–1.02	0.07
Parity			
1	REF		
2-4	0.87	0.15–5.12	0.88
5-9	3.98	0.16–99.7	0.40
Complications (yes vs. no)	0.33	0.03–3.72	0.37
History of preterm delivery (per unit increase)	0.76	0.14–4.04	0.75
Vaginal bleed (yes vs. no)	1.75	0.28–10.76	0.55
Steroids			
0 mg	REF		
12 mg	0.24	0.02–3.65	0.30
24 mg	0.38	0.05–2.87	0.35
≥ 48 mg	1 (omitted)		
Year of birth (per unit increase)	1.16	0.65–2.06	0.61
Time of birth (in hours)			
≥ 0800 - ≤ 1700	REF		
>1700 - ≤ 2400	0.42	0.06–3.06	0.39
>0000 - <0800	0.37	0.04–3.08	0.36



Zuberi, Assistant Professor i.e., my advisor of Obstetrics/Gynecology Department.

Results

The statistical analysis showed that none of the variables were significantly associated with early very preterm compared to late delivery with only maternal age being associated with a trend (one year increase in age associated with 15% reduced odds of early delivery; Odds Ratio (OR) =0.85, 0.71–1.02; P=0.07) (Table 1). The ORs and P-values for other variables are also shown in Table 1. Multiple imputation for missing Hb variable conditional on all explanatory variables made maternal age statistically significant (P=0.045), while all other variables remained non-significant. Figure 1 shows restricted cubic spline graph of unadjusted relationship between Hb levels and gestational age, with initial linear relationship that plateaus off. The Youden’s Index of Hb and maternal age with maximum sensitivity and specificity is 9.6 gm/dL and 25.00 years. Our data had shown survival incidences of 0% at 23, 16.7% at 24, 40.0% at 25, 30.0% at 26, 33.3% at 27, 68.8% at 28 and 83.9% at 29 weeks, and that there is an increase (jump) in survival at 28 weeks of gestation. However, segregation at other cut-off points such as 25 weeks of gestation and delivery at this or earlier weeks does not have different predictors compared to later period delivery.

Conclusion

There are no antenatal/intrapartum predictors identified for early very preterm versus late delivery. The pathophysiology of prematurity does not vary in this time window of gestation for a cut-off at 25 weeks.

References

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