

QUALITY ASSESSMENT OF THE GESTATIONAL AGE TO ESTIMATE THE IMPACT OF THE MISCLASSIFICATION ON STILLBIRTH RISK

P2-P5

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LMP is the most accessible and low-cost method for defining gestational age. However, caution is suggested in its use because LMP showed low to moderate sensitivity and PPV when compared to the US <20 weeks and also underestimated the odds ratio for stillbirths.

BACKGROUND

Reliable gestational age (GA) is important for monitoring pregnancy results.

AIM

This study aims to assess the misclassification of GA according to different methods in stillbirths and live births in São Paulo, Brazil.

METHODS

This study is part of a case-control project (FetRiskS) to estimate stillbirth mortality. Stillbirths (cases) and live births (controls) of singleton pregnancies that occurred between Dec-19 and Dec-23 in 14 public hospitals in São Paulo, Brazil, were included.

The US <20 weeks (Reference standard), last menstrual period (LMP), and hospital records information were obtained from prenatal care cards, hospital charts, or the mother's interview.

We estimated the sensitivity and positive predictive value (PPV) by comparing the LMP with US <20 weeks and HR with US <20 weeks. Estimates were considered excellent if >90%, moderate if 70-90%, or low if <70% (Piper et al., 1993).

The crude odds ratio (OR) for stillbirths by GA groups (Term as reference) was estimated using the logistic regression model with 95%CI.

RESULTS

Of the 402 stillbirths and 419 live births included in the FetRiskS study, 268 (66.7%) stillbirths and 305 (72.8%) live births underwent US <20 weeks.

The majority of stillbirths was extreme preterm, while most live births are term, according to the three methods to obtain GA (Table 1).

Compared to the US <20 weeks, the sensitivity and PPV of Hospital records were greater than that observed for LMP among stillbirths (Table 2).

There is a decreasing trend in chances for stillbirths as GA increases, which is expected (Figure 1).

GA obtained from LMP was underestimated for most GA categories than that obtained from the hospital records when compared to the US <20 weeks, mainly in extreme preterm (OR=47.4 95%CI: 16.43;136.58) (Figure 1).

Table 1. Distribution of cases and controls according to gestational age, São Paulo - Brazil

Classification	US <20 weeks				LMP				Hospital records			
	Stillbirths		Live births		Stillbirths		Live births		Stillbirths		Live births	
	n	%	n	%	n	%	n	%	n	%	n	%
Extreme preterm	77	28.7	3	1.0	64	23.9	4	1.3	73	27.2	2	0.7
Very preterm	56	20.9	6	2.0	61	22.8	7	2.3	61	22.8	4	1.3
Moderate preterm	31	11.6	3	1.0	23	8.6	5	1.6	23	8.6	3	1.0
Late preterm	53	19.8	38	12.5	54	20.1	28	9.2	52	19.4	20	6.6
Term	46	17.2	200	65.6	51	19.0	151	49.5	53	19.8	190	62.3
Post-term	5	1.9	55	18.0	15	5.6	110	36.1	6	2.2	86	28.2
Total	268	100.0	305	100.0	268	100.0	305	100.0	268	100.0	305	100.0

Note: Extreme preterm <28 weeks; Very preterm 28-31 weeks; Moderate preterm 32-33 weeks; Late preterm 34-36 weeks; Early Term 37-38 weeks; Full Term 39-40 weeks; Post-term 41 weeks or more. LMP - Last menstrual period.

Table 2. Sensitivity and positive predictive value (PPV) analysis according to gestational age groups for stillbirths and live births, São Paulo - Brazil

Classification	Stillbirths							
	LMP			Hospital records				
	Sensitivity	95%CI	PPV (%)	Sensitivity	95%CI	PPV (%)	PPV (%)	
Extreme preterm	76.6	71.20	81.29	92.2	85.7	81.02	89.40	90.4
Very preterm	71.4	65.75	76.50	65.6	85.7	81.02	89.41	78.7
Moderate preterm	38.7	33.07	44.66	52.2	58.1	52.08	63.81	78.3
Late preterm	50.9	44.99	56.87	50.0	73.6	68.00	78.50	75.0
Term	63.0	57.12	68.60	56.9	84.8	79.99	88.59	73.6
Post-term	60.0	54.03	65.68	20.0	60.0	54.03	65.68	50.0
Classification	Live births							
	LMP			Hospital records				
	Sensitivity	95%CI	PPV (%)	Sensitivity	95%CI	PPV (%)	PPV (%)	
Extreme preterm	66.7	60.82	72.04	50.0	66.7	61.19	71.72	100.0
Very preterm	33.3	27.96	39.18	28.6	50.0	44.42	55.58	75.0
Moderate preterm	0.0	0.00	1.41	0.0	33.3	28.28	38.80	33.3
Late preterm	44.7	38.90	50.72	60.7	50.0	44.42	55.58	95.0
Term	60.0	54.03	65.68	79.5	79.5	74.62	83.65	83.7
Post-term	63.6	57.72	69.17	31.8	76.4	71.29	80.79	48.8

Note: Extreme preterm <28 weeks; Very preterm 28-31 weeks; Moderate preterm 32-33 weeks; Late preterm 34-36 weeks; Early Term 37-38 weeks; Full Term 39-40 weeks; Post-term 41 weeks or more. LMP - Last menstrual period.

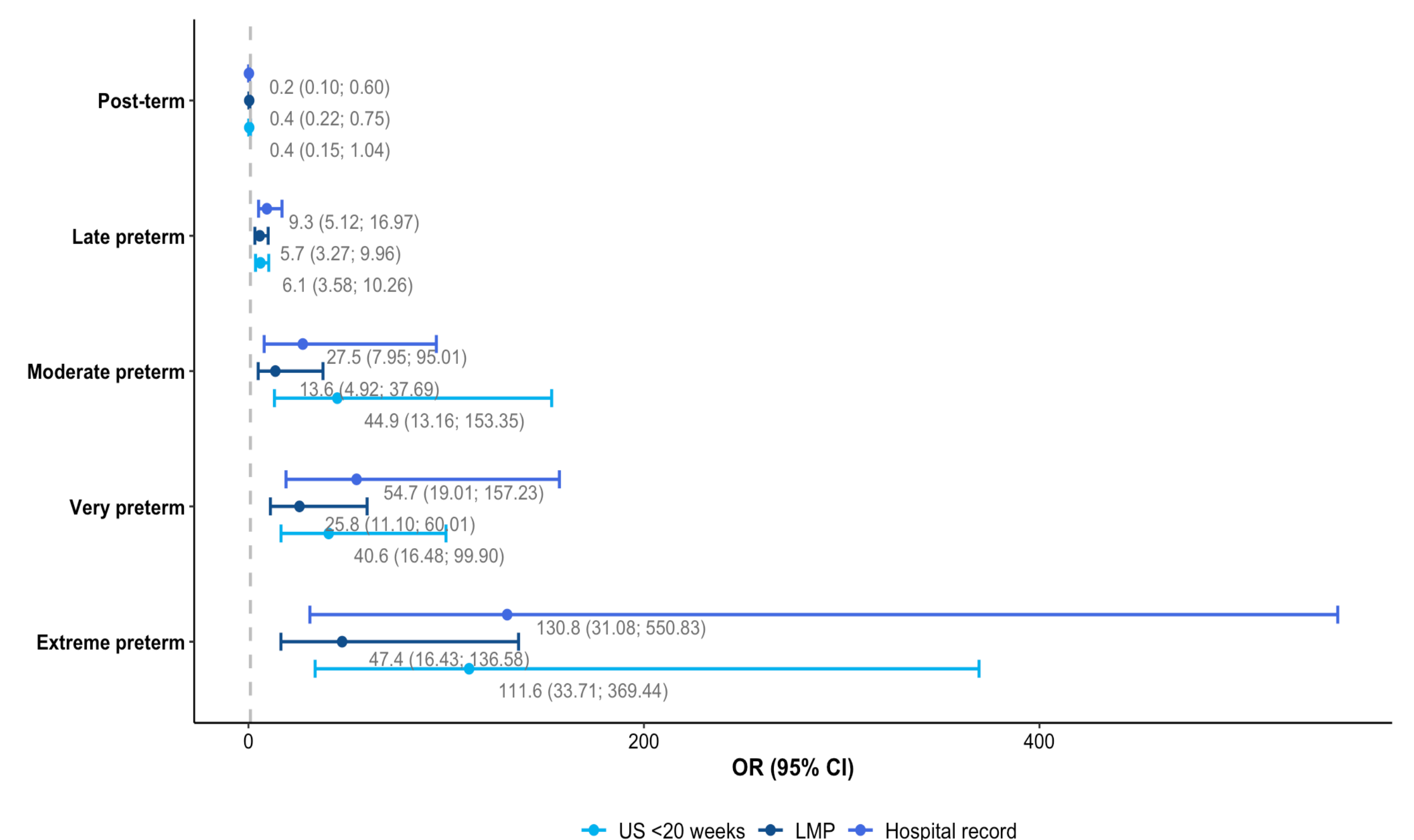


Figure 1. Odds ratio for stillbirths according to gestational age groups, São Paulo - Brazil

CONCLUSIONS

- The sensitivity and PPV of stillbirths were higher than those found for live births in both methods when compared to the US <20 weeks.
- Gestational age obtained by LMP had lower sensitivity compared to the US <20 weeks in both stillbirths and live births.
- LMP underestimated the odds ratio for stillbirths in all GA strata among preterm infants.
- This study suggests caution in using data for estimating GA, strengthening the use of information obtained from early ultrasound scan results.

ADDITIONAL INFORMATION

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Conflicts of Interest: Nothing to declare.

