Neonatal Near Miss in the WHO Global Survey Brazil: a Pilot Study to Evaluate the Quality of Perinatal Care

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Research Project of Participant

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Introduction

Globally:

- **10 million infant deaths/year**
- **Vast majority occur in developing countries**
- **38% of the total infant deaths occur in the neonatal period**
- **Most of them take place in the 1st week of life**

In Brazil:

- **36,000 early neonatal deaths/year**

Introduction

- **As key concepts for the present analysis:**
  - **Early Neonatal Death: the infant death that occur in the first week of life**
  - **Neonatal Near Miss Case: the neonate that survived a life-threatening condition**
- **Lack of standard definition for neonatal near miss**
- **But, it could be useful to improve perinatal health care**

OBJECTIVES

- **To develop the concept of neonatal near miss**
- **To adapt the WHO maternal near miss indicators to the neonatal context**
- **To test this approach as a tool:**
  - **To evaluate quality of perinatal care**
  - **To identify priority facilities for health care strengthening**

Methods

- **Secondary analysis of the 2005 WHO Global Survey on Maternal and Perinatal Health**

- **In Brazil:**
  - **19 randomly selected hospitals**
  - **Short period of data collection (2-3 months)**
  - **Information on 15,169 neonates**

- **Two-step strategy:**
  - **Individual level**
  - **Facility level**

METHODS

- **Analysis at individual level:**
  - **Comparison:**

NEONATES THAT DIED IN THE FIRST WEEK OF LIFE

VS

NEONATES THAT SURVIVED THIS FIRST WEEK

  - **Odds ratios and positive likelihood ratios were calculated**
  - **Identification of life-threatening conditions at birth strongly associated with Early Neonatal Deaths.**

- **Analysis at facility level:**
  - **For each facility, the near miss indicators were calculated**

Results

IDENTIFICATION OF CONDITIONS AT BIRTH STRONGLY ASSOCIATED WITH EARLY NEONATAL DEATH

	Early neonatal death		Alive at 7th day	OR (95% CI)
	Rate of ENM %	N	n	
All live births	0.8	124	15045	
Gender				
Male	0.9	66	7479	1.17 (0.82-1.67)
Female	0.8	57	7541	1.00
Gestational age at birth				
< 30 weeks	43.0	52	69	415.65 (242.60-712.15)
<37weeks	7.1	89	1164	42.17 (26.76-66.45)
37 - 41 weeks	0.2	24	13237	1.00
>41 weeks	1.0	3	286	5.78 (1.73-19.32)
Birth weight				
< 1500g	34.9	74	138	331.08 (198.26-552.91)
<2500g	6.6	102	1437	43.83 (27.31-70.31)
2500 – 4000g	0.2	21	12966	1.00
>4000g	0.2	1	598	1.03 (0.14-7.69)
Apgar score < 7 at 5 minutes				
< 7	25.4	66	194	99.54 (67.14-147.59)
≥ 7	0.3	50	14630	1.00
Any congenital malformation				
Yes	12.7	30	207	24.06 (15.56-37.21)
No	0.6	89	14775	1.00
Product of a multiple pregnancy				
Yes	4.7	16	323	6.75 (3.95-11.55)
No	0.7	108	14722	1.00

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Could we define a Neonatal Near Miss case as a baby that was born with <30 weeks of Gestational Age or <1500g or had an Apgar 5' <7 AND survived ?

Condition		Early neonatal deaths +	Early neonatal deaths -	Sensitivity	Specificity	Positive likelihood ratio	Availability of the information in the medical records
	+	a	b	a/(a+c)	d/(b+d)	sensitivity / 1-specificity	(a+b+c+d) / 15169
	-	c	d				
Gestational age at birth <30wks	+	52	69	44.8%	99.5%	95.4	97.6%
	-	64	14618				
Very Low Birth Weight	+	74	138	59.7%	99.1%	64.9	99.7%
	-	50	14863				
Apgar 5' <7	+	66	194	56.9%	98.7%	43.5	98.5%
	-	50	14630				
Any of the above	+	100	324	82.6%	97.8%	37.0	96.4%
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This could be a valid pragmatic definition!

Neonatal near miss and early neonatal deaths

- A similar pattern of associations with maternal characteristics was found
- Both conditions may share key determinants
  - severe maternal complications
  - mode of delivery
- Then, the pragmatic definition could be useful

Evaluation of Quality of Perinatal Care

Facility	Neonatal near miss incidence rate (cases per 1,000 LB)	Severe neonatal outcome rate (cases per 1,000 LB)	Early neonatal mortality index (%)
BR1	30.6	30.6	0.0%
BR2	4.5	6.0	0.0%
BR3	12.4	16.0	0.0%
BR4	13.1	13.6	3.7%
BR5	34.2	37.5	6.1%
BR6	18.6	20.4	8.7%
BR7	38.7	48.4	14.3%
BR8	28.3	34.7	13.9%
BR9	4.5	5.6	20.0%
BR10	21.7	29.0	25.0%
BR11	16.8	23.3	27.8%
BR12	10.2	16.3	28.6%
BR13	29.8	45.3	28.9%
BR14	12.8	18.2	30.0%
BR15	42.3	61.6	30.4%
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BR17	28.3	51.6	37.8%
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NNM Cases / Total number of live births

Evaluation of Quality of Perinatal Ca

«AMOUNT OF CARE NEEDED»

END + NNM

Total number of live births

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NNM Cases

Total number of live births

«AMOUNT OF CARE NEEDED»

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Total number of live births

«QUALITY OF PERINATAL CARE »

Neonates with life-threatening conditions at birth that died

Total number of neonates with life-threatening conditions at birth

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Percentile	Severe Neonatal Outcome Rate (‰ Live births)	Early Neonatal Mortality Index (‰ Live births)	Level
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34-66	15- 40	10-30	Medium
67-100	>40	> 30	High

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This could be useful to determine the priorities for health care strengthening …

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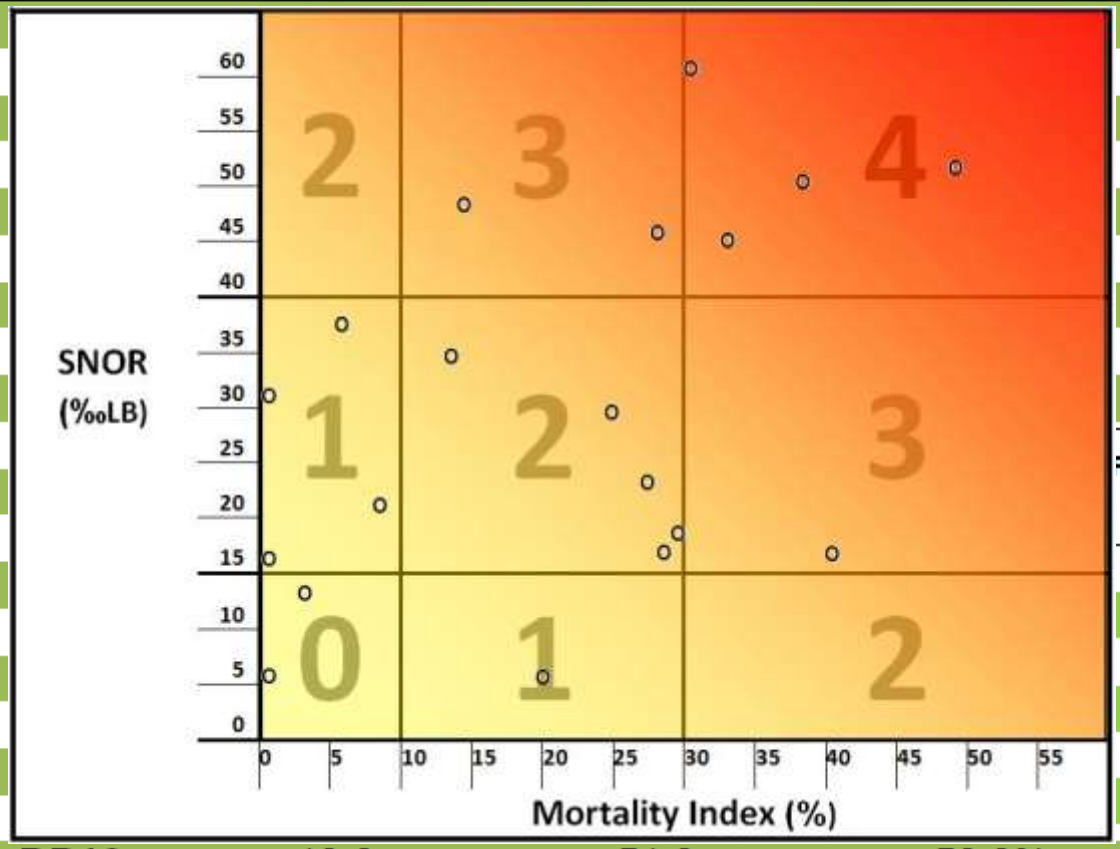

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Conclusions

- **This is an ongoing work!**
- **It seems that the near miss concept could be useful to assess the quality of perinatal care and identify priorities**
- **We intent to test this approach in the Global dataset of the WHO Global Survey**

Thank you!