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THE OCCURRENCE AND REPERCUSSIONS OF LATE PREMATURITY AND EARLY TERM BIRTH IN SERGIPE, BRAZIL

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ABSTRACT: We studied the maternal and neonatal characteristics of three gestational age groups in maternity hospitals of Sergipe, Northeast, Brazil: late preterm infants-LPTI (34-36 weeks and 6 days) early-term infants-ETI (37-38 weeks and 6 days) full-term infants-FTI (39-41 weeks and 6 days). This is a sectional and descriptive study including all maternity hospitals in operation in the state of Sergipe, performed from June to October/2015. There were 11 maternity hospitals in total, 7 in country-side and 4 in the Aracaju, and 5 public, 2 private and 4 public/private funded. We included 729 mother-infant dyads with 397 from Aracaju and 332 from the countryside. There was no difference among the groups regarding the type of birth, parity and other characteristics regarding the newborn and their mothers, with the exception of maternal age, younger in the groups with shorter gestational age ($p<0.001$). There were more admissions before labor on the ETI group compared to the FTI group ($p<0.001$).There was a decreasing trend for morbidities like transient tachypnea ($p<001$) and jaundice using phototherapy ($p=0.024$), as with use of CPAP ($p=0.004$) and NICU hospitalization ($p=0.043$) as the gestational age increases. We also found that the shorter the gestational age is ($p<0.001$) exclusive breastfeeding decrease at hospital discharge. These findings show an increase in morbidities and the need for interventions for the groups that are close to term and the

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risk of ablactation, highlighting the importance of postponing the ending of gestation for beyond the 39o week period.

Keywords: late preterm, early term, neonatal morbidities

RESUMO: Foram estudadas as características maternas e neonatais de três faixas etárias gestacionais em maternidades de Sergipe, Nordeste, Brasil: pre-termo tardio - RNPTT (34-36 semanas e 6 dias) termo precoce - RNTP (37-38 semanas e 6) dias) a termo - RNT (39-41 semanas e 6 dias). Trata-se de um estudo seccional e descritivo, incluindo todas as maternidades em operação no estado de Sergipe, realizado de junho a outubro / 2015. Havia 11 maternidades no total, 7 no interior e 4 no Aracaju, e 5 públicas, 2 privadas e 4 públicas / privadas. Foram incluídas 729 díades mãe-bebê, sendo 397 de Aracaju e 332 do interior. Não houve diferença entre os grupos quanto ao tipo de nascimento, paridade e outras características em relação ao recém-nascido e suas mães, com exceção da idade materna, mais jovens nos grupos com menor idade gestacional (p<0,001). Houve mais admissões antes do trabalho de parto no grupo RNPT em comparação com o grupo RNT (p <0,001). Houve uma tendência decrescente de morbidades como taquipneia transitória (p <001) e icterícia com fototerapia (p = 0,024), assim como no uso de hospitalização por CPAP (p = 0,004) e UTIN (p = 0,043) à medida que a idade gestacional aumenta. Também descobrimos que quanto menor a idade gestacional (p <0,001), menos é oferecido aleitamento materno exclusivo na alta hospitalar. Esses achados mostram um aumento das morbidades e a necessidade de intervenções para os grupos próximos ao termo e o risco de ablação, destacando a importância de adiar o término da gestação para além do período de 39 semanas.

Palavras-chaves: pre-termo tardio, termo precoce, morbidades neonatais.

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BACKGROUND

With the preterm birth rate of the whole world being estimated as10%, and with a 5% fluctuation in parts of Europe and 18% in parts of Africa, there are 15 million children born prematurely every year (BLENCOWE et al., 2012). Developed countries like the United States of America (USA) showed an average of 11,4% in all births occurred before the 37º week of the gestational period (OSTERMAN et al., 2015).

More frequently, the shorter the gestation period, the more frequent are the occurrence of complications, but the 34 to 36 weeks and 6 days group encompasses most of the preterm births, with over 70% of the newborns (NB) (ADAMKIN, 2009). In Brazil, as in most medium to low income countries in the world, preterm birth continues to be the leading cause of deaths and complications during the neonatal period (first 28 days since birth) with its harmful effect being felt even on early childhood, and being recognized worldwide as a serious public health problem (ARAÚJO et al., 2012). In the USA, 17,5% of births occur between the 37º and the 38º weeks of gestation, period in which the term is consolidating, resulting in a higher volume of hospitalizations on the Neonatal Intensive Care Unit (NICU) and use of mechanical ventilation (OSHIRO et al., 2009) in this group.

For all professionals involved, the greater load of care work is reserved for the extreme preterm birth, less than 32 weeks of gestational age (GA) and high rates of morbidity and mortality. Previously, the newborns between the 34º and the 36º gestational weeks and six days period were considered of similar risk than the term newborns according to studies performed in the 1980s (GOLDENBERG et al., 1984), being called newborns “next to term”.

In 2005, the *National Institute of Child Health and Human Development* created a study group hat developed recommendations regarding preterm births, including altering the naming to late preterm infants (LPTI), with the purpose of highlighting the premature condition and its immature physiology and metabolism, presenting a higher risk of medical complications, both on short and long-term bases, inherent to this condition (ENGLE, 2006).

Studies show that the LPTI has higher rates of morbidity and mortality than the term newborns (ENGLE, 2006; TOMASHEK et al., 2007; KHASHU et al., 2009). But the group of early-term infants (ETI), those born between the 37 and 38 weeks and 6 days of GA, also may show, in several cases, a higher number of complications, at least in the

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neonatal period, compared to those born between the 39 and 41 weeks and 6 days of GA (full-term infants - FTI) (OSHIRO et al., 2009; TITA et al., 2009; SPONG, 2013).

There's been less focus on the ETI group than on the LPTI, certainly because they are considered as on term (above the 37º week of GA). This study aims to analyze tendencies and differences amongst the maternal characteristics of assistance and maternal and newborn morbidities between the three IG groups (LPTI, ETI, and FTI).

METHOD

This is a sectional, quantitative and descriptive study, based on a universal state hospital inquiry, performed on public and private maternity hospitals on the federal state of Sergipe, encompassing the 11 (eleven) maternity hospitals that performed at least 500 births in 2014. Maternities were located 7 in the country-side and 4 in the capital city (Aracaju), and of these, 5 were publicly funded, 2 were private and 4 were funded by both systems.

The methodology applied for this study was the same used on the *Estudo Nascer no Brasil* (Birth in Brazil Study) (DO CARMO LEAL et al., 2012), with the same strategies used for collecting samples on maternity hospitals. Sample size estimation also fallowed the same procedure of *Nascer no Brasil*, to be representative for the federal state of Sergipe.

The sample size estimation was made taking into consideration the proportion of 53,88% of C-sections (DATASUS, 2014), amounting a total of 358 women interviewed. The sample draft was probabilistic in two stages: the first corresponded to health establishments and the second regarding the mother and their newborns. For further improving the range of the study and analyzing its associations with other variables, especially LPTI and ETI, 729 pairs of newborns and recently delivered mothers were studied.

The study included deliveries between June and October 2015, with newborns over 34 and less than 42 weeks of gestation born alive. NBs were excluded from the study if they showed congenital malformation and if their medical charts were not filed correctly or had missing information.

The gestational period was calculated using the available criteria on the following priority order: obstetric ultrasound on the first trimester of gestation, the last menstrual

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period (LMP) and pediatric NB evaluation following the Capurro method (CAPURRO et al., 1978).

To evaluate gestational age role on problems, the NB were classified into three groups: 1º) LPTI, with GA between 34 and 36 weeks and 6 days; 2º) ETI, with GA between 37 and 38 weeks and 6 days and 3 º) FTI, with GA between 39 and 41 weeks and 6 days. The NB with 42 weeks of gestation and over (post-term) were not included in this study.

We used the same research methods of *Nascer no Brasil* study related to the objectives and questions of this work (DO CARMO LEAL et al., 2012). In the first 24 hours after delivery, the mothers were interviewed.

The data were described using simple frequency and percentages when the variables were categorical and mean and standard deviation when they were continuous. On the purpose of evaluating mean differences, the Kruskal-Wallis test was used; With the intent of evaluating the association and tendency's in categorical variable and gestational period using the linear-to-linear association (or Qui-Square Trend Test); with the intent of evaluating multiple comparisons, the Tukey test was used for continuous variables, and the Z test, with Bonferroni correction for categorical variables. The software used was R Core Team 2017.

The study was approved by the Ethics Committee for researches at the Federal University of Sergipe, with the number 453.279/2013, CAAE 22488213.4.0000.5546. All the measures were taken to guarantee information secrecy, as stated in the Dictum nº 466/2012 of the National Health Ministry of Brazil. The parturient signed the term of consent, refusal ensure at any time, with no chance of loss.

RESULTS

Of the 729 NB included, 53 (7.3%) were LPTI, 198 (27.7%) ETI and 478 (65.6%), FTI. The average maternal age was significantly different ($p < 0.001$) between the groups. The LPTI group had younger mothers (<19 years) and older mothers (>=35 years) than the other two groups and the ETI had also both younger and older mothers than the FTI group. There was no difference between groups regarding the number of prenatal medical appointments, number of births and gestations and method of financing for the maternity hospital (Table 1).

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Table 1. Structural and maternal characteristics of maternity groups by gestational age in maternity hospitals of Sergipe, 2015

	Gestational Age (week)			p-value
	34 to 36/6 LPTI N(%)	37 to 38/6 ETI N(%)	>39 FTI N(%)	
Mother's Age (years)				
<19	16 (30.2)a	47 (23.7)a	92 (19.2)a	<0.001
20-34	25 (47.2)a	128 (64.6)a.b	352 (73.6)b	
>=35	12 (22.6)a	23 (11.6)a.b	34 (7.1)b	
Prenatal appointments				
<7	25 (47.2)	69 (34.8)	176 (36.8)	0.261
>=7	28 (52.8)	129 (65.2)	302 (63.2)	
Mean(SD)	8.77 (13.08)	11.29 (18.22)	10.08 (15.15)	0.509
Births				
0	2 (4)	7 (4)	26 (5)	0.772
1-2	21 (39)	89 (45)	180 (38)	
>3	30 (57)	102 (52)	272 (57)	
Previous gestations				
0	22 (41)	86 (43)	212 (44)	0.667
1-2	21 (40)	78 (39)	185 (39)	
>3	10 (19)	34 (17)	81 (17)	
Types of birth				
Vaginal	28 (53)	115 (58)	288 (60)	0.174
Intrapartium C-section	8 (15)	25 (13)	71 (15)	
Elective C-section	17 (32)	58 (29)	119 (25)	
Financing method				
Private	8 (15)	36 (18)	61 (13)	0.165
Public	45 (85)	162 (82)	417 (87)	
Place of birth				
Capital city	41 (77)a	123 (62)a	233 (49)b	<0.001
Country-side	12 (23)a	75 (38)a	245 (51)b	

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Gestation type				
Single	50 (94)a	195 (99)a.b	477 (99.8)b	<0.001
Double or multiple	3 (6)a	2 (1)a.b	1 (0.2)b	
Previous C-section				
0	19 (63.3)	61 (60.4)	164 (70.1)	0.166
1	8 (26.7)	30 (29.7)	55 (23.5)	
>1	3 (10)	10 (9.9)	15 (6.4)	

Linear-for-Linear Association; SD: Standard Deviation; a.b.c: Tukey test 5% distinct subgroups (continual variables) or Bonferroni corrected Z tests (categorical variables); LPTI: late pre-term infants; ETI: early term infants; FTI: full term infants.

The place of birth and the type of gestation was significantly different. Aracaju´s LPTI group births were more frequent (41; 77%) followed by the ETI group (123; 62%) and more than FTI (223; 49%). The prevalence of multiple gestations was more frequent in the LPTI group (3; 6%) and then the FTI group (1; 0.2%), but the volume of occurrences was small on all three groups (Table 1).

The average weight of newborns was different (p<0.001) among the three groups, with a rising tendency depending on the gestational age (2,891g in LPTI, 3,117g in ETI and 3,376g in FTI). There were no differences between the groups regarding sex and Apgar score (Apgar) for the three groups (Table 2)

The LPTI was less exclusively breastfeed (30; 61%) than the ETI (156; 80%) and even less than the FTI (407; 87%). There was no difference in glucose use between groups, although LPTI used more frequently (p=0.446).There was also no difference on breastfeeding in the first hour of life (LPTI: 33; 62.3%; ETI: 109; 56.2%, FTI: 290; 60.8%). (Table 2).

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Table 2. Newborn characteristics according to gestational age group in Sergipe maternity hospitals, 2015

	Gestational age (weeks)			p-value
	34 to 36/6 LPTI N(%)	37 to 38/6 ETI N(%)	>39 FTI N(%)	
Gender				
Male	27 (51)	100 (51)	246 (52)	0.963
Female	26 (49)	98 (49)	230 (48)	
APGAR 1º minute				
< 3	0 (0)	0 (0)	5 (1)	0.134
>=3	53 (100)	198 (100)	473 (99)	
Mean (SD)	8.42 (0.91)	8.58 (1.02)	8.58 (1.26)	0.651*
APGAR 5º minute				
<7	0 (0)	1 (1)	7 (1)	0.183
>=7	53 (100)	197 (99)	471 (99)	
Average (SD)	9.44 (0.70)	9.63 (0.67)	9.68 (1.03)	0.202*
Weight (grams)				
Average (SD)	2891 (611)a	3117 (437)b	3376 (438)c	<0.001*
Discharge in Exclusive Breastfeeding				
No	23 (39)a	40 (20)b	62 (13)b	<0.001
Yes	30 (61)a	156 (80)b	407 (87)b	
Other types of aliments on internment				
Venous Glucose/Oral glucose	3 (13.6)	5 (13.5)	5 (7.8)	0.446
Breast milk/Human	11 (47.8)	8 (21.1)	18 (28.1)	0.205
Formula	11 (50)	23 (60.5)	41 (64.1)	0.281
Parental Nutrition (TPN)	1 (4.3)	1 (2.6)	2 (3.0)	1.000
Breastfeeding in the first hour of life				
No	20 (37.7)	85 (43.8)	187 (39.2)	0.627
Yes	33 (62.3)	109 (56.2)	290 (60.8)	

Linear-for-Linear Association; SD: Standard Deviation; Kruskal-Wallis Test; 5% distinct subgroups for the z test with Bonferroni correction;LPTI: late pre-term infants; ETI: early term infants; FTI: full term infants.

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Table 3 shows the birth-related data. Amongst the analyzed variables we could observe significant statistical differences on labor at admission. The LPTI had significantly less possibility of access to vaginal birth than the other two groups, as in 33% of them there was no labor at admission, which did not happen for 31% of the ETI and 19% of the FTI. The LPTI had the highest rate of C-section indication at admission (32.1%, as opposed to the 28.1% in ETI and 25.2% in FTI) but this and the other analyzed variables did have statistically significant differences.

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Table 3. Characteristics of birth assistance according to the gestational age group on maternity hospitals of Sergipe, 2015.

	Gestational age (weeks)			p-value
	34 to 36/6 LPTI N (%)	37 to 38/6 ETI N (%)	>39 FTI N (%)	
There was an indication of C-Section at admission				
No	36 (67.9)	141 (71.9)	353 (74.8)	0.251
Yes	17 (32.1)	55 (28.1)	119 (25.2)	
Labor atadmission				
No	17 (33)a.b	61 (31)b	90 (19)a	<0.001
Yes	35 (67)a.b	133 (69)b	381 (81)a	
Use of analgesics during labor				
No	31 (97)	116 (96)	308 (96)	0.894
Epidural and/or Spinal	1 (3)	5 (4)	13 (4)	
Breach of membranes in labor:				
No, Breach before admission	10 (38)	43 (46)	92 (40)	0.108
Yes, Spontaneous breach	11 (42)	24 (26)	62 (27)	
Yes, artificial (professional)	2 (8)	12 (13)	18 (8)	
Yes, no reason specified	3 (11)	15 (16)	59 (26)	
Was the companion present during labor?				
No	12 (55)	56 (63)	131 (70)	0.377
Yes	10 (45)	33 (37)	57 (30)	
Anesthesia use:				
No	15 (56)	60 (61)	147 (59)	0.878
Epidural and/or Spinal	1(4)	9 (9)	11 (4)	
Local	11 (40)	30 (30)	90 (36)	

Linear-for-Linear Association; a,b; 5% distinct subgroups for the Z test with Bonferroni correction. LPTI: late pre-term infants; ETI: early term infants; FTI: full term infants.

Table 4 presents some complications occurring in the NB in the first 24 hours after birth. The complications were significantly associated with the gestational age: use of incubator (p<0.001), hospitalization (p=0.001), Intensive care hospitalization (p<0.043), use of continuous positive airway pressure (CPAP) (p=0.004), use of phototherapy in the first 72h of life (p<0.024) and transient tachypnea (p<0.001). The LPTI group always had

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a greater need for the use of interventions than the other two groups, with the ETI having more interventions than FTI (Table 4).

Table 4. Newborn assistance characteristics and its morbidities by gestational age group on maternity hospitals in Sergipe, 2015

	Gestational age (week)			p-value
	34 a 36/6 LPTI N (%)	37 a 38/6 ETI N (%)	>39 FTI N (%)	
Intervention inDR				
No	35 (88)	135 (94)	337 (94)	0.252
Yes	5 (12)	9 (6)	22 (6)	
O2 inhalation inDR				
No	47 (92)	179 (93)	426 (96)	0.408
Yes	4 (8)	7 (4)	18 (4)	
Bag + mask ventilation in DR				
No	48 (94)	181 (97)	431 (97)	0.455
Yes	3 (6)	5 (3)	13 (3)	
Orotracheal intubation inDR				
No	50 (98)	183 (98)	436 (98)	0.869
Yes	1 (2)	3 (2)	7 (2)	
Cardiac massage inDR				
No	50 (98)	185 (99)	438 (99)	0.828
Yes	1 (2)	1 (1)	6 (1)	
Drugs inDR				
No	51 (100)	186 (100)	443 (99.8)	0.500
Yes	0 (0)	0 (0)	1 (0.2)	
Aspiration of upper airways inDR				
No	16 (33)	65 (38)	146 (38)	0.676
Yes/	33 (67)	104 (62)	241 (62)	
Gastric aspiration inDR				
No	32 (63)	108 (56)	240 (64)	0.683
Yes	17 (37)	55 (34)	135 (36)	
Vitamin K (Kanakion)				
No	1 (2)	1 (1)	4 (1)	0.744
Yes	50 (98)	189 (99)	455 (99)	

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Silver nitrate eye drops				
No	14 (27)	45 (25)	92 (21)	0.140
Yes	36 (73)	137 (75)	352 (79)	
Hepatitis B vaccine				
No	1 (2)	7 (5)	17 (5)	0.471
Yes	40 (98)	147 (95)	313 (95)	
Did the baby go to the Incubator?				
No	47 (90)a	188 (96)a.b	466 (99)b	<0.001
Yes	5 (10)a	7 (4)a.b	4 (1)b	
Was the baby hospitalized?				
No	40 (76)a	178 (90)b	439 (92)b	0.001
Yes	13 (24)a	20 (10)b	39 (8)b	
Hood				
No	6 (43)	20 (80)	27 (61)	0.579
Yes	8 (57)	5 (20)	17 (39)	
CPAP				
No	9 (64)a	22 (92)a.b	42 (95)b	0.004
Yes	5 (36)a	2 (8)a.b	2 (5)b	
Mechanical ventilation				
No	11 (79)a	24 (100)a	42 (95)a	0.087
Yes	3 (21)a	0 (0)b	2 (5)a.b	
Neonatal intensive care admission				
No	6 (40)a	19 (79)b	32 (74)b	0.043
Yes	9 (60)a	5 (21)b	11 (26)b	
Hypoglycemia (glycemia less than 40) in the first 48 hours of life				
Yes	1 (6.7)	1 (4.5)	2 (4.8)	1.000
Phototherapy in the first 72 hours of life				
Yes	9 (60)a	8 (36.4) a.b	11 (25.6)b	0.024
Transient tachypnea				
Yes	6 (11.3)a	2 (1) b	4 (0.8)b	<0.001

Linear-for-Linear Association; a,b; 5% distinct subgroups for the z test with Bonferroni correction LPTI: late pre-term infants; ETI; early term infants; FTI : full term infants.DR: Delivery room; CPAP: Continuous positive airway pressure. Note: Percentages calculated over valid data.

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DISCUSSION

There are differences between the groups of gestational age at birth, with a higher number of intercurrences occurring as gestational age decreases, even among those considered term. This study shows that LPTI and ETI are subject to greater neonatal morbidity than the FTI.

In 2010, 15 million preterm babies were born around the world, with Brazil hitting the 10º position worldwide with the highest number of pre-term births (BLENCOWE et al., 2012). The LPTI grew about 40% in the United States, between 1998 and 2003 (ARAÚJO et al., 2012). The ETI represents almost 1/3 of the births over 37 weeks of GA in the USA (TITA et al., 2009). Due to the progressive increase in the premature birth frequency in the world, it is necessary to know the more prevalent morbidities in these groups. In the USA, the LPTI group accounts for 74.4% of preterm births and 7.7% of all births (DAVIDOFF et al., 2006). In 2005, 9.6% of births worldwide were premature (BECK et al., 2010), but in 2013 this percentage increased to 11.4% (OSTERMAN et al., 2015).

In Brazil, the prematurity rate in 2011 was 11.5%, with 74% of LPTI (DO CARMO LEAL et al., 2016). In our study, 9.38% of premature newborns were included, and 75.7% of which included LPTI (data not shown), similar to that described in other studies, whose proportion of LPTI among premature infants ranged from 63.2 to 79% (MCINTIRE; LEVENO, 2008; DEMESTRE GUASCH et al., 2009; FURZÁN; SÁNCHEZ, 2009) Moreover, almost 30% of the infants with more than 37 weeks were ETI, similar to those described by Tita in the USA (35.8%) (TITA et al., 2009).

Rates of spontaneous prematurity have remained stable in most high-income countries, but rates of iatrogenic prematurity between 32 and 36 weeks' gestation have increased: in the USA it has increased by 68% between 1995/1996 and 2004/2005, from 1.9 to 3.2 per 1,000 live births (LISONKOVA; HUTCHEON; JOSEPH, 2011) and in Scotland, it has increased 44%, from 0.9 to 1.3 per 1000 live births between 1980-1984 and 2000-2004 (NORMAN; MORRIS; CHALMERS, 2009).

This has led to the mobilization of international organizations, such as the American Academy of Obstetrics and Gynecology, to create guidelines to ensure that there is no labor induction before 39 weeks unless there is a convincing medical indication (GYNECOLOGISTS, 2013a, 2013b).

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Cesarean deliveries in this study corresponded to 47% among LPTI, 42% between ETI and 40% between FTI. These data are larger than those found by Osterman and Martin (2013) (OSTERMAN; MARTIN, 2013), which describe prevalence of 36.3% among LPTI, 32.2% between ETI and 30.1% among FTI in the USA. In a study involving 17 European countries and more than 1.5 million single live births, the frequency of cesarean deliveries reported for ETI was similar in countries such as Austria, Germany and Malta - about 40%, with delivery rates among the ETI, and much higher than the FTI in all the countries studied (DELNORD et al., 2014). The presumption of fetal maturity at 37 weeks of GA is cited as one of the justifications for this increased exposure of ETI to cesarean delivery (ENGLE; KOMINIAREK, 2008).

In this study, we found a decreasing tendency regarding GA, in the frequency of admissions without labor, highlighting the greater difference between ETI and FTI. This increases the chance of termination of pregnancy by cesarean section at earlier stages of pregnancy, and perhaps without evidence-based medical indication, leading to risks of death and of preventable neonatal and maternal morbidities.

The literature emphasizes greater morbidity, including potentially fatal lung disease, especially when undergoing cesarean delivery without labor, with a 120-fold increased risk of ventilatory support due to surfactant deficiency among ETI compared to FTI (MADAR; RICHMOND; HEY, 1999). There is a higher frequency of induction of labor on weekdays and during the day, increasing the possibility that many of these inductions occur for reasons of convenience (OSHIRO et al., 2009; TITA et al., 2009).

About 2/3 of LPTI deliveries were performed in Aracaju. This can be justified because the only NICU beds available are located there, both in the private or public sector. The rate of births on maternity hospitals in the capital followed a decrease among the GA groups (LPTI>ETI>FTI). This has probably happened because the first group of patients was rightfully referred to the facilities with adequate support for the assistance of NB at risk.

In Brazil, in the private services, during the prenatal and delivery phase, the pregnant mothers choose the obstetrician for follow up. In the public services, the pregnant mother is followed by different professionals during the prenatal and delivery phases. We could find a higher number in vaginal births amongst the public-sector users (55.2%), whereas in the private sector there is a greater number of C-sections (89.9%) (DOMINGUES et al., 2014). In Sergipe, there was no discrepancy amongst the three

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groups of gestational age and the type of funding of the maternity hospital regarding births, number of prenatal appointment and maternal obstetric characteristics.

Maternal age below 19 years was progressively more frequent amongst the groups with younger gestational age, with LPTI being higher than ETI and these higher than FTI.

The link between the late prematurity and maternal age below 19 years old found in this paper was also described in a previous countrywide study (SANTOS et al., 2008).

Another national paper describes the higher frequency of LPTI born from women over 35 years old (ARAÚJO et al., 2012), data also found in the present paper.

In low and medium-income countries, the newborn's weight is a decisive factor of neonatal health and is deeply connected to child mortality and morbidity, with the risk being 20 times higher in children that are born under 2,500g (WARDLAW, 2004). We found that the newborn's weight is directly related to the gestational age group, with a higher chance of low birth weight infants (<2,500g) among the LPTI. This indicates the necessity for interventions to avoid iatrogenic interruption of labor on the edge of term (LPTI and ETI), based only on the gestational age, considering how close to the term is sufficient to guarantee the physiologic maturity of RN. It's worth pointing out that the average weight gain of the fetus is about 2.5 Kg between 28 and 40 weeks (about 200g a week) (RASMUSSEN; YAKTINE, 2009), with the one week stay in the uterine environment possibly representing the difference between life and death in many parts of the world.

Regarding the Apgar score, which is used as a clinical evaluation of RN on the 1º and 5º minutes of life, there was no difference between the groups. Although the LPTI group have Apgar scores like the FTI group, they show a higher mortality and morbidity rate, probably due to the metabolically and physiology immaturity, that emerges during the first days of life (SPONG et al., 2011; MACHADO; PASSINI JÚNIOR; ROSA, 2014). The neonatal and infant mortality rate on LPTI is respectively five and three times higher than in the FTI group (TOMASHEK et al., 2007; KHASHU et al., 2009), with reports of hospitalizations and medical complications in the first year of life (TOMASHEK et al., 2007). The LPTI is at greater risk of not breastfeeding than the FTI (GIANNÌ et al., 2016).

Breastfeeding in premature infants is, in many cases, postponed due to neurological immaturity, and the muscular hypotonic that makes the reflexes of suction, swallowing, and breathing less efficacious (BEZERRA et al., 2012). There was a growing trend amongst the analyzed groups for exclusive breastfeeding (EBF) during the

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hospital stay, alerting to the risks of lack of breastfeeding in the younger gestational age group: Increased risk of gastroenteritis, respiratory diseases, necrotizing enterocolitis, neonatal sepsis, acute otitis media, problems in cognitive development, among others (RENFREW et al., 2012). Because of the higher mortality and morbidities risks, the LPTI and the ETI are the biggest beneficiaries of EBF, being necessary specific strategies for improvement of breastfeeding in these groups. The lowest frequency of EBF at hospital discharges amongst the LPTI (61%) when compared to FTI (87%) was also found in another paper (DEMIRCI; SEREIKA; BOGEN, 2013), with 62% for LPTI and 70.1% for FTI.

The LPTI group more frequently was under potentially dangerous and fatal diseases during the neonatal period: hypothermia, hypoglycemia, respiratory diseases, eating difficulties, jaundice with the need for phototherapy, infections, intracranial hemorrhage and necrotizing enterocolitis (TEUNE et al., 2011).The rise in the number of births in this group is linked to the rising number of admissions on NICU, as well as a higher hospital stay (MACHADO; PASSINI JÚNIOR; ROSA, 2014). There was a decrease in the need of NICU (60%, 21% and 26% for LPTI, ETI, and FTI, respectively) which also occurred in another countrywide paper with 54% for LPTI and 4.4% for FTI (ARAÚJO et al., 2012).

There was not a significant difference between the groups regarding the need for resuscitation at delivery room. Another study, conducted in reference neonatal units in Brazil reported the need for intervention in 46% of LPTI against 28% in FTI (DE ALMEIDA et al., 2007). In our study the sample size was not calculated to evaluate this variable.

Exposure to oxygen therapy carries the risk of pathologies such as bronchopulmonary dysplasia and retinopathy, as well as barotrauma lesions, which can greatly reduce the quality of life of surviving children (OSTERMAN et al., 2015). Some studies show that even when prenatal evaluation tests show pulmonary maturity, there is a higher chance of respiratory morbidity among the LPTI and ETI when compared to FTI, reaching hyaline membrane disease frequency seven times more amongst the 36 and 38 weeks of gestational age NB in relation to the ones with 39 and 40 weeks (BATES et al., 2010). Similar facts may occur in other systems beyond the respiratory systems, causing more complications in an “apparently” mature group.

The CPAP device increases the airways pressure without the need for tracheal intubation. The beneficial effects come from factors like the increase in pulmonary

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expansion, preservation of endogenous surfactant, improvement in oxygenation and reduction of respiratory work (MORLEY; DAVIS, 2008). In the current research, the use of nasal CPAP was different between the groups with decreasing tendency regarding the rise in GA. A systematic revision that includes 22 studies and 29.375.675 NB describes the relative risk being 16 times higher of nasal CPAP use among LPTI when compared to FTI (TEUNE et al., 2011).

Regarding the presence of transient tachypnea, there was a decreasing tendency amongst the groups. Other studies can show a higher rate of transient tachypnea and hyaline membrane disease amongst the ETI when compared to the FTI (TITA et al., 2009), and, a higher frequency of neonatal infection and higher hospital stay (KHASHU et al., 2009). Within the same trend, it could be shown a higher hypoglycemic frequency, NICU admission, and hospitalizations for 5 or more days amongst the ETI when compared to FTI (TITA et al., 2009).

The higher frequency in LPTI phototherapy found here was also noted in other publications (MCINTIRE; LEVENO, 2008; DEMESTRE GUASCH et al., 2009; MAC BIRD et al., 2010).

A limitation on the present paper was that there was a low rate of obstetric ultrasound in the 1º trimester of gestation and of LMP remind, but we have used Capurro score calculation by trained personnel to estimate the GA when the two information was not available. It was not analyzed the C-section indications, which could guide the proportion of iatrogenic prematurity. Specific projects to evaluate this information are necessary. Also, there was some loss of data due the lack of some subjects in the medical reports.

CONCLUSION

Sergipe shows 9.38% of premature births with a high percentage of NB classified as LPTI and ETI, which may have a direct relationship with the C-sections without the presence of spontaneous labor.

It is worth noting the GA declining trend of admission without labor, bringing a higher risk of cesarean delivery for the groups of lower GA.

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In the current paper, the absence of EBF inversely related to GA bears to mind the risk of higher early weaning on LPTI, the most vulnerable group and the damaging consequences of this.

There was a decrease in the complications with the gestational age increase of groups, highlighting the rate of morbidities in the ETI, the group that, although it had over 37 weeks, had similar problems to the ones of LPTI and represented about a third of NB with over 37 weeks of GA. It's important to highlight the national and international recommendations saying that, without a clear medical indication, the birth must not be performed before 39 weeks, even if it is by request of the mother (GYNECOLOGISTS, 2013a, 2013b). A better knowledge of the differences between the three groups of GA can help on the development of treatment and prevention strategies that reach the ones that are at a higher risk of avoidable mortality and morbidities, postponing the interruption of the pregnancy for after the 39ª week.

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