ARTICLE ORIGINAL / ORIGINAL ARTICLE

SHORT-TERM NEONATAL OUTCOME IN SINGLETON, LATE PRETERM DELIVERIES
A Three-Year Experience at a Single Lebanese Center

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ABSTRACT • Background : There has been a decrease in the mean gestational age at delivery worldwide mostly due to an increase in deliveries occurring at late preterm period (LPP) with a concomitant rise in the rate of morbidities among newborns delivered at this period. **Objectives :** To report the frequency of common short-term neonatal morbidities in infants born at LPP (between $34^{0/7}$ and $36^{6/7}$ weeks' gestation) and to compare these frequencies with those of full-term infants born at our institution. **Materials & Methods :** A descriptive cohort study (2008-2010) at Makassed General Hospital. All deliveries occurring at LPP constituted the study group (n = 361), while births at or beyond 37 weeks' gestation were considered as controls (n = 2814). **Results :** The average rate of deliveries in LPP was 11.4% for the entire study period. The rate of Neonatal Intensive Care Unit admissions, respiratory morbidities, sepsis, jaundice, hypothermia, hypoglycemia and overall neonatal morbidity were all significantly higher in LPP infants when compared to those at term (p-value < 0.013). **Conclusion :** In our cohort of Lebanese newborns delivered at LPP, significantly higher morbidities were encountered when compared to full-term newborns. Every possible effort should be exerted to avoid elective deliveries during LPP in order to curb the incidence of neonatal morbidities.

Keywords : late preterm period, neonatal morbidity, respiratory morbidity.

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RÉSUMÉ • Contexte : Une baisse de la moyenne de l'âge gestationnel à l'accouchement a été signalée mondialement ; ceci est dû à l'augmentation du nombre d'accouchements prématurés tardifs. **Objectifs :** Étudier la fréquence de la morbidité à court terme chez les nouveau-nés issus d'accouchements prématurés tardifs ($34^{0/7}$-$36^{6/7}$ semaines d'aménorrhées). **Matériels & Méthodes :** Une étude descriptive, réalisée à Makassed General Hospital pendant la période 2008-2010, a porté sur les accouchements prématurés tardifs (n = 361) et les accouchements à terme pris comme groupe témoin (n = 2814). **Résultats :** Le taux d'accouchements prématurés tardifs a été de 11,4%. Les admissions aux soins intensifs en néonatologie, les problèmes respiratoires, les septicémies, l'ictère, l'hypothermie et les hypoglycémies ont été rapportés avec un taux plus élevé chez les prématurés tardifs que chez les nouveau-nés issus d'un accouchement à terme (p < 0,013). **Conclusion :** La morbidité élevée dans le groupe de nouveau-nés issus d'un accouchement tardif nous incite à éviter, dans la mesure du possible, les accouchements prématurés tardifs.

INTRODUCTION

The rate of preterm births in the United States increased from 9.1% in 1981 to 10.6% in 1990, reaching a maximum of 12.8% in 2006, declining thereafter to 12.2% over three consecutive years [1-3]. The rise of preterm births during the last three decades was primarily due to the increase in late preterm births from 7.3 % in 1990 to 9.1% in 2006 and accounted for over 250,000 births per year [4]. These comprised about three-quarters of all singleton preterm births [5]. Late-preterm infants were often considered functionally and developmentally mature and were hence managed by protocols developed for full-term infants [6]. These practices were based on previous studies reporting neonatal morbidity and mortality in the late preterm period (LPP) to be only slightly higher in comparison with term infants [7-8]. In fact, late-preterm infants are physiologically and metabolically immature; consequently, they are at greater risk than term infants of developing medical complications that result in higher rates of mortality and morbidity during the birth hospitalization [9]. Moreover, they have higher rates of readmission during the neonatal period [10] and first year of life [11], in addition to being at an increased risk for long-term neurodevelopmental impairment [12].

It is a well-known fact that most high risk pregnancies with medical or obstetrical problems are delivered before 39 weeks and usually at tertiary care centers where facilities and resources are available to manage complications related to premature delivery [13].

Our objectives were to report the rate of short-term

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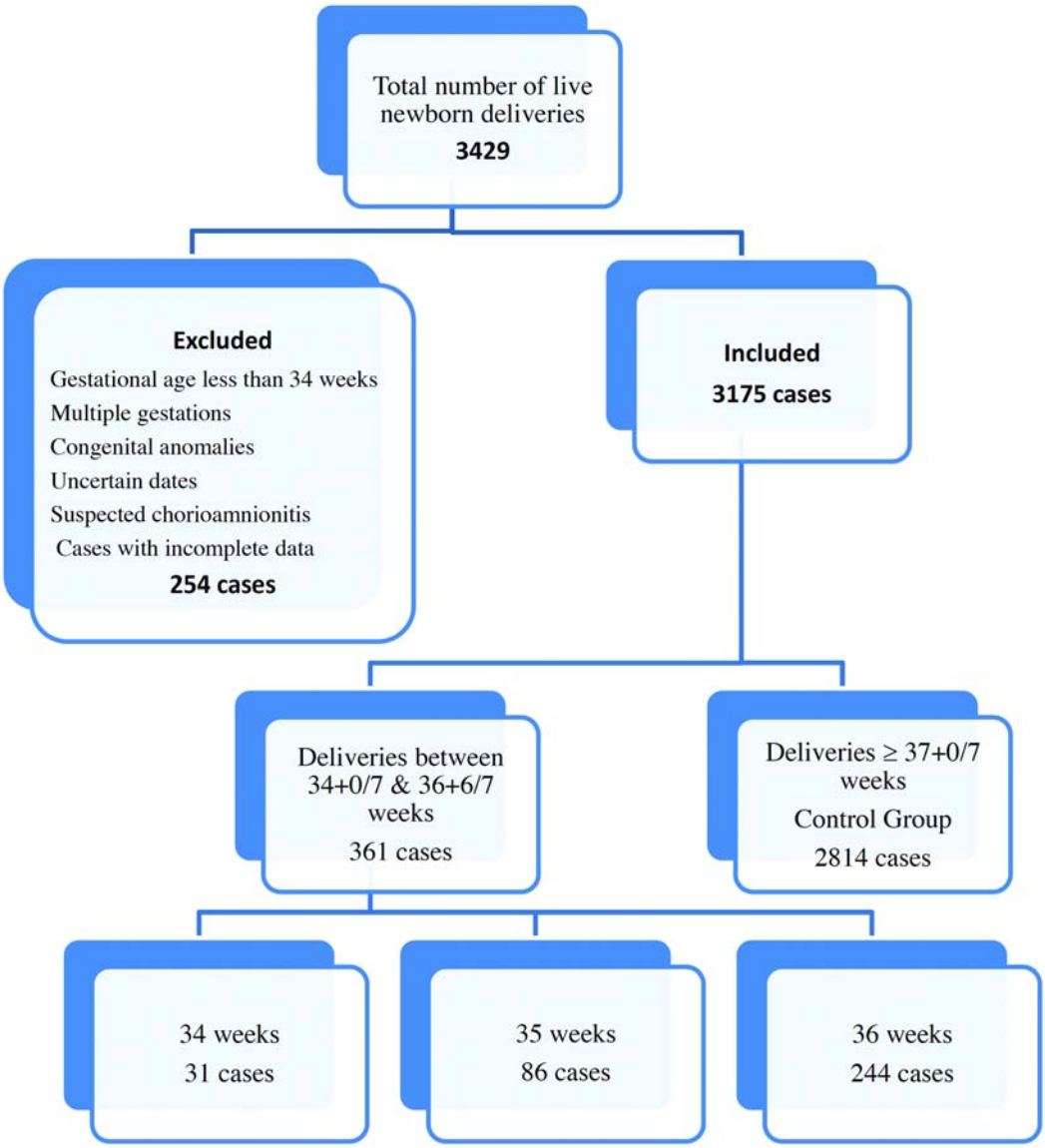

Figure 1. Flow chart of case selection.

neonatal outcomes of deliveries in LPP in a Lebanese population served at our institution according to gestational age (GA) and compare these outcomes with infants born at term in the past three years.

MATERIALS AND METHODS

A cohort study, where all deliveries (beyond $34^{0/7}$ weeks' gestation) born at Makassed General Hospital in the period between January 1st, 2008 and December 31st, 2010 were included. The study group ($34^{0/7}$ to $36^{6/7}$ weeks' gestation) was compared with a control group (full-term deliveries ≥ 37 weeks' gestation). The study protocol was approved by the Institutional Review Board at Makassed General Hospital. Initially, the study was executed prospectively from January 1st, 2010 till December 31st, 2010. However, since some neonatal morbidities related to this age are uncommon events, we elected to expand our study to include the previous two years in a retrospective fashion.

Makassed General Hospital is a 240 bed tertiary care teaching facility located in the center of Greater Beirut. Both the Pediatrics and Obstetrics and Gynecology departments have residency programs where the diagnosis and management of diseases follow the guidelines of the American Academy of Pediatrics and the American College of Obstetrics and Gynecology.

Inclusion criteria consisted of all singleton deliveries (low- and high-risk) beyond $34^{0/7}$ weeks' gestation, whereas all deliveries occurring before $34^{0/7}$ weeks in addition to those complicated by any of the following conditions: multiple gestations, suspected chorioamnionitis, congen-

ital malformation, uncertain dates, non-followed cases with incomplete data were excluded. Cases were identified by searching in our institutional medical records database for all singleton deliveries beyond $34^{0/7}$ gestational age.

Abstracted demographic data included maternal age, parity, neonatal complications, gestational age, newborn gender, birth weight and mode of delivery.

Gestational age determination was based on sure last menstrual period (LMP) confirmed by ultrasonography done in the first half of pregnancy. Gestational age assignment was as follows: all deliveries occurring between $34^{0/7}$ and $34^{6/7}$ were included in the 34 weeks' category, whereas deliveries occurring between $35^{0/7}$ and $35^{6/7}$ were included in the 35 weeks' category and finally deliveries occurring between $36^{0/7}$ and $36^{6/7}$ were considered to be in the 36 weeks' category. All deliveries occurring beyond 37 completed weeks were considered as term controls.

Neonatal short-term outcome variables included admission to the neonatal intensive care unit (NICU), respiratory morbidity, need for assisted mechanical ventilation, need for oxygen support, need for phototherapy, hypoglycemia, hypothermia, and suspected sepsis in hospitalized newborn infants. Composite neonatal outcomes were two; the first was overall morbidity and the second was composite respiratory morbidity. Overall morbidity was defined as the presence of any morbidity, while composite respiratory morbidity was the presence of any of respiratory distress syndrome (RDS), transient tachypnea of the newborn (TTN), pneumonia pneumothorax or meconium aspiration syndrome. Supplementary oxygen was given when oxygen saturation was less than 92%, and/or mild respiratory distress occurred. Supplemental oxygen was given for a maximum period of two days. Intubation was done when • there was persistent hypoxemia • patient did not respond to supplemental oxygen • and/or moderate to severe respiratory distress occurred. Hypoglycemia was defined as blood glucose level of less than 40 mg/dl in capillary or venous blood sample. Hypothermia occurred when newborn core body temperature was less than 36.0° C. Admission criteria to the NICU included any of the following: birth weight less than 1,800 g, respiratory morbidity, persistent hypoglycemia, suspected sepsis, or requirement for close observation as assessed by the neonatologist. Suspected sepsis was diagnosed based on clinical symptoms such as respiratory distress, poor perfusion, temperature instability, hypo- or hyperglycemia, in addition to positive lab results (C-reactive protein and complete blood count with differential).

Data analysis was performed using SPSS program version 16.0. Chi square test was used to estimate significance in discrete variables and Student's t test for continuous ones. *P* value < 0.05 was considered significant. Forward stepwise multivariate logistic regression was performed to depict the most important risk factors for NICU admission, composite respiratory morbidity and the development of any morbidity.

TABLE I
DEMOGRAPHIC FEATURES ACCORDING TO GROUPS

	Study Group (361)	Control Group (2814)	*p*-value
Mean parity*	1.32 ± 1.2	1.21 ± 1.2	*0.11*
Mean maternal age* (years)	29.0 ± 5.9	28.2 ± 5.6	*0.12*
Male gender**	199 (55.1%)	996 (35.4%)	*0.21*
Primiparity**	105 (29.1%)	996 (35.4%)	*0.01*
Cesarean delivery**	177 (49.0%)	1069 (38.0%)	*< 0.001*

*Mean ± standard variation **Number & (rate)

RESULTS

During the three-year study period, 3429 live newborn infants were delivered. After exclusion of 254 cases due to gestational age less than 34 weeks, multiple gestations, congenital anomalies, uncertain gestational age, suspected chorioamnionitis and incomplete data, we were left with 3175 cases, of which 361 were delivered in the LPP and constituted the study group, while the remaining 2814 were delivered beyond 37 weeks' gestation and were considered the control group (Figure 1).

The rate of deliveries occurring in LPP was 11.3% in 2008, 12.3% in 2009 and 10.6% in 2010 with an average of 11.4% for the entire study period.

Demographic variables showed that mean parity and mean maternal age were not different between the two groups (1.32 vs. 1.21; *p*-value = 0.11) and (29.0 vs. 28.2 years; *p*-value = 0.12) in the study and control groups respectively. The rate of male gender was also similar between both groups (55.1% vs. 52.8%; *p*-value = 0.21). However, statistically significant difference was noted in the rate of cesarean deliveries which was higher in the study group (49.0% vs. 38.0%; *p*-value < 0.001). The rate of primiparity was significantly higher in the control group (35.4% vs. 29.1%; *p*-value = 0.01) (Table I).

All outcome parameters which included the composite variables together with individual variables showed statistically significant difference between the two groups. The rate of any morbidity was significantly higher in the study group (36.8% vs. 10.7%; *p*-value < 0.001; OR = 4.8; 95% CI: 3.8-6.2). The rate of NICU admissions was significantly greater in the study group 13.9% vs. 2.3% respectively (*p*-value < 0.001; OR = 6.9, CI 4.6-10.1). Respiratory morbidities were significantly greater in the study group. The rate of RDS was 3.9% in the study group compared to 0.1% in the control group (*p*-value < 0.001; OR = 37.8; CI 10.8-132.2). Furthermore, 6.9% of patients in the study group had TTN compared to 1.6% in the control group (*p*-value < 0.001; OR = 4.5; CI 2.7-7.5). Oxygen support was needed by 7.2% and 1.3% of the cases in the study and control groups respectively (*p*-value < 0.001; OR = 5.8; CI 3.4-9.7). Mechanical ventilation was provided to 5.3% and 0.9% of the patients in the

TABLE II
NEONATAL OUTCOME ACCORDING TO GROUPS

Outcome	Study Group* (361)	Control Group* (2814)	*p*-value	Odds Ratio	95% Confidence Interval
Any morbidity	133 (36.8%)	301 (10.7%)	*< 0.001*	4.8	3.8 - 6.2
Neonatal Intensive Care Unit admission	50 (13.9%)	64 (2.3%)	*< 0.001*	6.9	4.6 - 10.1
Suspected sepsis	6 (1.7%)	11 (0.4%)	*0.02*	4.3	1.5 - 11.7
RESPIRATORY MORBIDITIES					
Respiratory distress syndrome	14 (3.9%)	3 (0.1%)	*< 0.001*	37.8	10.8 - 132.2
Transient tachypnea of the newborn	25 (6.9%)	45 (1.6%)	*< 0.001*	4.5	2.7 - 7.5
Oxygen support	26 (7.2%)	37 (1.3%)	*< 0.001*	5.8	3.4 - 9.7
Mechanical ventilation	19 (5.3%)	26 (0.9%)	*< 0.001*	5.9	3.2 - 10.8
Composite respiratory morbidity	43 (11.9%)	53 (1.9%)	*< 0.001*	7.0	4.6 - 10.7
METABOLIC MORBIDITIES					
Phototherapy	88 (24.4%)	176 (6.3%)	*< 0.001*	4.8	3.6 - 6.4
Hypoglycemia	46 (12.7%)	91 (3.2%)	*< 0.001*	4.3	3.0 - 6.3
Hypothermia	34 (9.4%)	30 (1.1%)	*< 0.001*	9.6	5.8 - 15.9

*Data are presented as number and corresponding percentage.

study and control groups respectively (p-value < 0.001; OR = 5.9; CI 3.2-10.8). The rate of composite respiratory morbidity was significantly higher in the study group in comparison to the control, 11.9% vs. 1.9% respectively (p-value < 0.001; OR = 7.0; CI 4.6-10.7). Similarly, metabolic morbidities were significantly different between the two groups. Phototherapy was performed to 24.4% of the patients in the study group compared to 6.3% in the control (p-value < 0.001; OR = 4.8; CI 3.6-6.4). The rate of hypoglycemia was significantly higher in the study group 12.7% vs. 3.2% respectively, (p-value < 0.001; OR = 4.3; CI 3.0-6.3). Hypothermia occurred in 9.4% of the patients in the study group compared to 1.1% in the control (p-value < 0.001; OR = 9.6; CI 5.8-15.9) (Table II).

When all these variables were studied according to their relation with gestational age, it was obvious that they followed a continuous decreasing pattern as the gestational age increases in almost all of the variables (p-value < 0.001) except for suspected sepsis. The rates of any morbidity were 61.3%, 41.9%, 32.0% and 10.7% for newborns at 34, 35, 36 and ≥ 37 weeks respectively. NICU admission rose from 2.3% to 10.7%, 16.3% and 32.2% as gestational age decreased from ≥ 37 weeks to 34 weeks. The rate of RDS decreased from 19.4% to

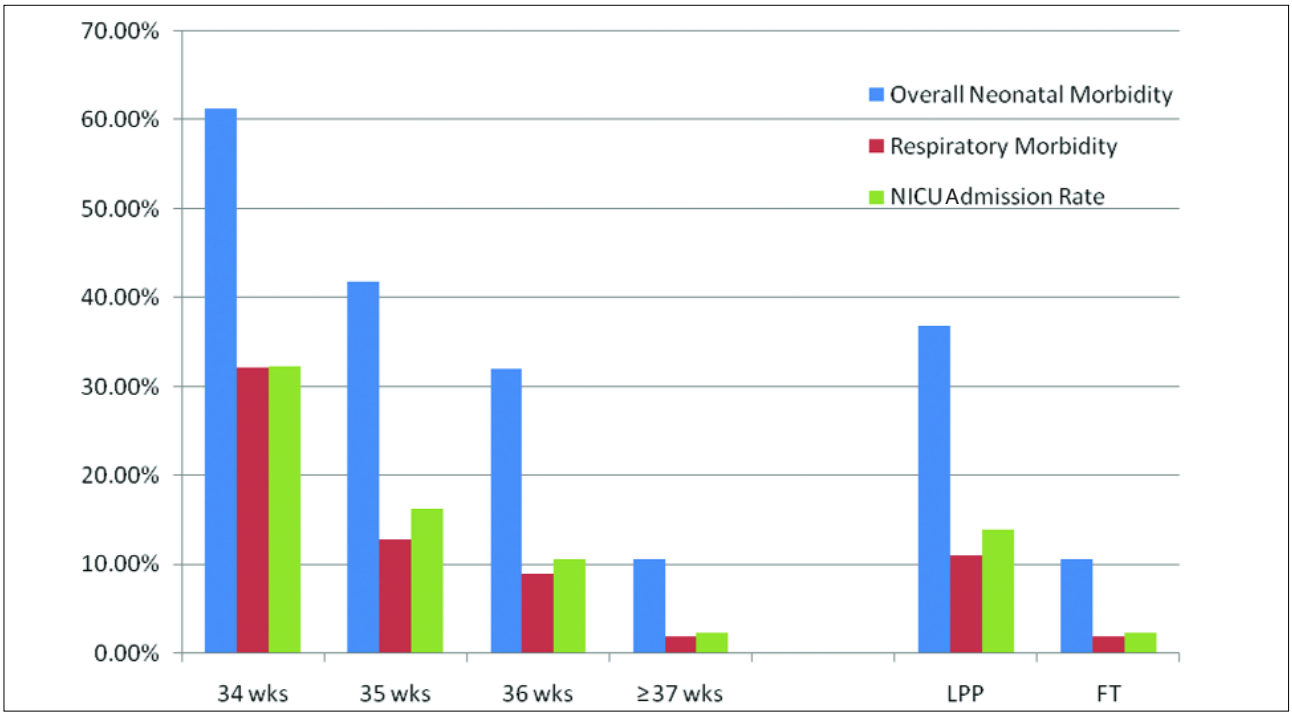

FIGURE 2. Relation of overall neonatal morbidity, respiratory morbidity, and NICU admission compared to gestational age.
NICU: Neonatal Intensive Care Unit **LPP**: late preterm period **FT**: full term

TABLE III
NEONATAL OUTCOME PER GESTATIONAL WEEK *

Outcome	34 weeks (31)	35 weeks (86)	36 weeks (244)	≥ 37 weeks (2814)	*p*-value
Any morbidity	19 (61.3%)	36 (41.9%)	78 (32.0%)	301 (10.7%)	*< 0.001*
Neonatal Intensive Care Unit admission	10 (32.3%)	14 (16.3%)	26 (10.7%)	64 (2.3%)	*< 0.001*
Suspected sepsis	NA	2 (2.3%)	4 (1.8%)	11 (0.4%)	NA
RESPIRATORY MORBIDITIES					
Respiratory distress syndrome	6 (19.4%)	3 (3.5%)	5 (2.0%)	3 (0.1%)	*< 0.001*
Transient tachypnea of the newborn	4 (12.9%)	8 (9.3%)	13 (5.3%)	45 (1.6%)	*< 0.001*
Oxygen support	5 (16.1%)	8 (9.3%)	13 (5.3%)	37 (1.3%)	*< 0.001*
Mechanical ventilation	5 (16.1%)	4 (4.7%)	10 (4.1%)	26 (0.9%)	*< 0.001*
Composite respiratory morbidity	10 (32.2%)	11 (12.8%)	22 (9.0%)	53 (1.9%)	*< 0.001*
METABOLIC MORBIDITIES					
Phototherapy	11 (35.5%)	27 (31.4%)	50 (20.5%)	176 (6.3%)	*< 0.001*
Hypoglycemia	7 (22.6%)	12 (14.0%)	27 (11.1%)	91 (3.2%)	*< 0.001*
Hypothermia	4 (12.9%)	10 (11.6%)	20 (8.2%)	30 (1.1%)	*< 0.001*

*Data are presented as number and corresponding percentage. **NA**: not available

3.5%, 2.0 and 0.1% as gestational age increased from 34 to ≥ 37 weeks. Likewise, the rate of TTN ranged from 12.9% to 1.6% between 34 and ≥ 37 weeks of gestation. Oxygen support was provided to 16.1% of the cases born at 34 weeks of gestation vs. 1.3% of the cases born at ≥ 37 weeks of gestation. Mechanical ventilation was performed to 16.1%, 4.7%, 4.1% and 0.9% of the cases born at 34, 35, 36 and ≥ 37 weeks respectively. Composite respiratory morbidity increased from 1.9% to 32.2% as gestational age decreased from ≥ 37 weeks to 34 weeks. Phototherapy was done to 35.5% of the cases born at 34 weeks in comparison to 6.3% born at ≥ 37 weeks. The rate of hypoglycemia was smaller in cases born at ≥ 37 weeks compared to those born at 34 weeks (3.2% vs. 22.6% respectively). Similarly, the rate of hypothermia ranged between 12.9% and 1.1% for cases born at 34 and at ≥ 37 weeks respectively (Table III).

Owing to the small sample size, some neonatal outcomes were absent such as neonatal mortality, necrotize enterocolitis and intraventricular hemorrhage. The frequency of overall neonatal morbidity, composite respiratory morbidity, and NICU admission compared to gestational age are displayed in figure 2.

Forward step-wise logistic regression was applied to study risk factors for NICU admission, composite respiratory morbidity and any neonatal morbidity (Table IV). Lower gestational age at delivery, lower fetal weight, and cesarean route of delivery were significant and independent factors in the three composite neonatal outcome variables. On the other hand, while parity had a significant role in the development of respiratory morbidity and NICU admission, no effect on the overall neonatal morbidity was noted. The OR for gestational age, fetal weight and C-section with respect to any morbidity were 0.689, 1.660 and 0.517 respectively. As for respiratory morbidity, the OR was 1.238, 0.618, 0.297 and 2.119 for primiparity, gestational age, fetal weight, and C-section respectively. The OR for primiparity, gestational age, fetal weight and C-section with respect to NICU admission were 1.197, 0.654, 0.270 and 2.157 respectively. Furthermore, male gender and maternal age did not play a significant role in this cohort.

DISCUSSION

In our cohort, the incidence of deliveries occurring in LPP was as follows: 11.3% in 2008, 12.3% in 2009 and 10.6% in 2010. Our figures were marginally higher than what was reported in the United States where the incidence was 9.0% in 2007 then became 8.7% in 2009 [4]. This could be understood from the fact that we are a tertiary care center where high risk pregnancies destined to

TABLE IV
FACTORS AFFECTING COMPOSITE NEONATAL OUTCOMES *

	Primiparity	Gestational age	Fetal weight	Cesarean delivery
Any morbidity	–	0.689 [0.635-0.747]	1.660 [1.343-2.052]	0.517 [0.403-0.664]
Respiratory morbidity	1.238 [1.065-1.439]	0.618 [0.527-0.724]	0.297 [0.183-0.480]	2.119 [1.361-3.299]
NICU admission	1.197 [1.040-1.378]	0.654 [0.566-0.756]	0.270 [0.173-0.422]	2.157 [1.439-3.233]

* Values are expressed as Odds Ratio and [95% Confidence Interval]. All *p*-values were < 0.013. **NICU**: Neonatal Intensive Care Unit

be delivered before 37 weeks' gestation and might need NICU are transferred to our service.

We excluded multiple gestations, fetuses with major congenital malformations and suspected chorioamnionitis. However, other factors that might have affected the outcome such as advanced maternal age, high parity, maternal obesity, diabetes, preeclampsia and antepartum hemorrhage were not excluded. Hence, our cohort included low as well as high risk pregnancies.

Concerning demographic features of the mothers, no statistically significant difference was elicited in maternal age, male gender, and mean parity between the two groups. It was evident that in LPP deliveries, the rate of cesarean section was significantly higher than term deliveries (49.0% vs. 38.0%) with a cesarean section rate of 39.2% for the whole cohort. A similar observation about higher rate of cesarean section among LPP infants was seen by Melamed *et al*. who found cesarean rate to be 27.7% vs. 17.3% (p-value < 0.001) in LPP infants and term infants respectively [14]. Another significant difference was seen in the rate of primiparity which was 29.1% in the study vs. 35.4% in the control group. This ratio was reversed in cohorts by Melamed *et al*. and McIntire *et al*. who reported more primiparas among women delivering in LPP [14-15]. However, this was in accordance with the study of Shapiro-Mendoza *et al*. who found that infants born in LPP were more likely to be delivered of primiparous mothers [9].

The *overall neonatal morbidity* seen in infants born at LPP was three- to fourfold higher than that in infants born at term (36.8% vs. 10.7%) and when considering outcome at ≥ 37 weeks' gestation as baseline, this morbidity was seen to be multiplied by 3, 4 and 6 times when gestational age shifted to 36, 35 and 34 weeks respectively. Our rates were in agreement with those reported by Melamed *et al*. (35.7% vs. 4.2%) [14], but were higher than those reported by Shapiro-Mendoza *et al*. (22.2% vs. 3.0%) [9] and McIntire *et al*. (25.0% vs. 14.0%) [15].

NICU admission rates were also found to be sixfold higher in LPP when compared to infants born at term (13.9% vs. 2.3%). The rates increased from 2.3% at ≥ 37 weeks to 10.7%, 16.3% and 32.3% as the weeks decreased. Our rates were marginally lower than those reported by Melamed, Bastek and Lubow [14,16-17].

Concerning *respiratory morbidities*, RDS complicated 3.9% infants born in LPP compared to 0.1% of those born at term while TTN complicated 6.9% vs. 1.6% of infants born at LPP and term respectively. Oxygen support was needed in 7.2% of late preterm infants compared to 1.3% in term infants whereas intubation or mechanical ventilation was used in 5.3% vs. 0.9% in LPP compared to term infants, and finally composite respiratory morbidity complicated 11.9% in LPP infants vs. 1.9% in term infants. Teune *et al*. in her systemic review on pooled data taken from 22 studies over a 10-year period reported a rate of RDS to be 5.3% in LPP infants vs. 0.39% in term counterparts, whereas TTN complicated 3.5% in LPP vs. 0.45% in term infants while oxygen support was provided to 6.0% vs. 0.51% in LPP and term infants respectively. Intubation or mechanical ventilation was also used in 2.5% vs. 1.2% in LPP compared to term infants [12]. The rate of composite respiratory morbidity was 11.9% vs. 1.9% in the study and control groups respectively, thus increasing by 5, 7 and up to 17 folds for each week from ≥ 37 to 34. Few studies reported composite respiratory morbidity and their rates were in general higher than ours. Bastek *et al*. rates were 18.8% vs. 2.2% and Lubow *et al*. rates were 20.0% vs. 5.0% [16-17].

Phototherapy was used to treat indirect hyperbilirubinemia in 24.4% vs. 6.3% of infants born at LPP and term respectively. Our rates were similar to those reported by Melamed *et al*. (21.2% vs. 2.5%) and Lubow *et al*. (25.0% vs. 4.0%) [14,17]. Teune and McIntire reported lower rates (4.6% vs. 1.3%) and (3.8% vs. 1.3%) respectively [12,15]. While Bastek *et al*. reported significantly higher rates of 40.6% vs. 4.7% [16].

Hypoglycemia was diagnosed in 12.7% in late preterm newborn infants vs. 3.2% term infants while *hypothermia* complicated 9.4% of late preterm newborn infants vs. 1.1% of term infants and suspected *sepsis* complicated 1.7% vs. 0.4% of LPP and term infants respectively. These rates were higher than those reported by Melamed *et al*.: hypoglycemia in 6.8% vs. 0.4%, hypothermia in 0.7% vs. 0.1% and sepsis in 0.4% vs. 0.04% in LPP infants compared to term infants respectively [14]. While Bastek *et al*. reported hypoglycemia to complicate 34.8% at LPP and 6.0% at term, hypothermia complicated 1.4% at LPP vs. 0.7 at term and sepsis was 7.2% at LPP vs. 4.5% at term [16].

Some rates of neonatal morbidities examined in our population were concordant with other studies while few rates differed marginally from those reported by other studies, yet they exhibited the same declining pattern with increasing gestational age. Due to small sample size, no cases of intraventricular hemorrhage, necrotizing enterocolitis or neonatal mortality were encountered in either group and were disregarded in the outcome tabulation.

The difference in the rate of some morbidities could be attributed in part to the small sample size of our cohort. Ethnic background, social economic status, composition of the cohort (all risk levels) as well as the rate of elective delivered in LPP could also have played a role. Nonetheless, the rates were not considerably different from those reported in the literature. The linear decreasing trend of rates with advancement of gestational age was evident in all short term morbidities.

To our knowledge, this is the first regional study to address the incidence and outcome of late preterm deliveries in a Lebanese population. The information presented in this study can serve local neonatologists and obstetricians when counseling patients at risk of delivery in LPP by providing an insight on the incidence of complications related to deliveries occurring in LPP. A limitation of the current investigation was that we did not study the effect of maternal medical or obstetrical conditions leading to delivery in LPP, which could have a compounding effect on the neonatal outcome.

CONCLUSION

In our population, newborns delivered in the LPP were found to have significantly higher morbidity when compared to full-term infants. The rate of short-term morbidities encountered among Lebanese newborn infants born in LPP was not significantly different from rates reported in other populations. Although deliveries at LPP might be necessary for limited medical or obstetrical conditions, concerned obstetricians can substantially help in decreasing elective and iatrogenic deliveries by proper early dating of pregnancies and declining elective deliveries in LPP. On the other hand, avoiding early discharge, close follow-up evaluation and special caring of these fragile newborns are good strategies to be practiced by the pediatricians.

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