The Timing of Elective Caesarean Section on Neonatal Respiratory Outcome in Hong Kong

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Objectives: To evaluate the incidence of neonatal respiratory morbidity in term infants, especially babies delivered in Hong Kong by elective Caesarean section, and to assess the influence of timing of elective Caesarean section on the respiratory outcome.

Methods: This was a retrospective study of all elective Caesarean sections on mothers with a gestational age of 37 weeks or more, that were performed in Tuen Mun Hospital from 1 January 2004 to 31 December 2009. Multiple pregnancies, fetuses with congenital anomalies, intrauterine deaths, and emergency Caesarean sections were excluded. Primary outcome measures of neonatal respiratory morbidity included transient tachypnoea of newborn, respiratory distress syndrome, persistent pulmonary hypertension of newborn, and pneumothorax. Only outcomes in Chinese women were analysed.

Results: A total of 31,420 term infants were delivered during the study period. After omitting infants because of special circumstances, 2602 infants delivered by elective Caesarean section and 23,208 babies delivered vaginally were included for analysis in this study. It was found that 43 (1.7%) infants of the elective Caesarean section group and 178 (0.77%) infants of those delivered vaginally suffered neonatal respiratory morbidity. Compared to those delivered vaginally increased risk of combined respiratory morbidity was noted in babies delivered by elective Caesarean section between week 37⁺⁰ and week 37⁺⁶ of gestation (adjusted odds ratio=2.98; 95% confidence interval, 1.4-6.5; p=0.006), and in those of Chinese ethnicity only (adjusted odds ratio=3.15; 95% confidence interval, 1.3-7.4; p=0.008). The risk for transient tachypnoea of newborn was significantly increased in those delivered by elective Caesarean section between week 37 and week 38⁺⁰/38⁺⁶ in the total population, while the increase in the Chinese was statistically significant only for deliveries before 38 weeks of gestation.

Conclusion: For Hong Kong Chinese infants, elective Caesarean delivery before 38 weeks of gestation is associated with significantly increased risk of neonatal respiratory morbidity. When considering elective Caesarean section before 38 weeks of gestation, obstetricians should carefully balance these risks and if feasible avoid the procedure. Hong Kong J Gynaecol Obstet Midwifery 2012; 12:13-20

Keywords: Cesarean section; Gestational age; Infant mortality; Infant, newborn, diseases; Respiratory distress syndrome

Introduction

The number of deliveries by Caesarean section is increasing all over the world¹. The trend is similar in Hong Kong. The overall Caesarean section rate increased from 22.5% in 1994 to 30.4% in 2004 and almost 10% were performed for social reasons². Other factors which contributed to the rising rates included being performed for breech delivery, previous Caesarean section, and multiple pregnancies. This raises a concern about the risks of elective Caesarean section to neonates.

Several large studies from different countries focusing on this issue have been published in recent years. Most found an increased risk in respiratory morbidities for infants delivered before 39 weeks. A recent Dutch study on 20,973 pregnancies noted that the frequency of combined respiratory outcomes (respiratory distress syndrome [RDS], transient tachypnoea of newborn [TTN], pneumothorax, etc.) was significant (p<0.0001) at 37 to 38 weeks compared to 39 weeks³. Moreover, another multicentre study in the USA found that births at 37 and 38 weeks were associated with an increased risk of respiratory complications (the adjusted odds ratio [OR] at 37 weeks was 2.1 and that at 38 weeks was 1.5; p for trend <0.001) when compared to 39 weeks⁴. Thus, the National Institute for Health and Clinical Excellence⁵, the Royal College of Obstetricians and Gynaecologists⁶, the American College of Obstetricians and Gynaecologists⁷, and the Royal Australian & New Zealand College of Obstetricians and Gynaecologists⁸ all

Correspondence to: Dr HM Tse Email: hiomeng@yahoo.com.hk recommend that routine elective Caesarean sections should not be performed before 39 weeks of gestation. However, it seems that there are no local data on this issue. In fact, many obstetricians in Hong Kong prefer performing elective Caesarean sections at around 38 to 39 weeks of gestation.

The aim of this study was to examine the local frequency of neonatal respiratory morbidities in those infants, especially those who were Chinese and delivered by elective Caesarean section in Hong Kong for comparing the outcomes with the overseas data.

Methods

This was a retrospective study that included all elective Caesarean sections of singleton pregnancies greater than 37 weeks of gestation in Tuen Mun Hospital (which is the only regional hospital providing obstetrics service in the New Territories West Cluster of Hong Kong) from 1 January 2004 to 31 December 2009. Exclusion criteria were multiple pregnancies, fetuses with congenital anomalies, intrauterine deaths, and emergency Caesarean sections. Primary outcome measures of neonatal respiratory morbidities included TTN, RDS, persistent pulmonary hypertension of the newborn, and pneumothorax. Combined respiratory morbidity represented the total number of infants suffering from any one of the four aforementioned morbidities.

Data were retrieved from the Clinical Data Analysis and Reporting System of the Hospital Authority, supplemented by the hospital's Clinical Management System and the Obstetric Specialty Clinical Information System. The diagnoses of neonatal respiratory morbidities were established based on the discharge records under the following codes of the international classification of diseases, 9th revision: transitory tachypnoea of the newborn (770.6), respiratory distress of the newborn (770.8(3)), persistent pulmonary hypertension of the newborn

Table 1. Characteristics of the pregnancy

Characteristic	No. (%) of elective Caesarean section	No. (%) of vaginal delivery	p Value
Mean maternal age ± SD (years)	32 ± 5	29 ± 5	<0.001
Race			<0.001
Chinese	2215 (85)	20,531 (88)	
Non-Chinese	387 (15)	2677 (12)	
Parity			<0.001
Primiparas	478 (18)	11,131 (48)	
Multiparas	2124 (82)	12,077 (52)	
With IGT/GDM/DM	447 (17)	1366 (6)	<0.001
Infant sex			0.157
Male	1302 (50)	11,957 (52)	
Female	1299 (50)	11,248 (48)	
Unknown	1	3	
Birth weight (g)			0.791
≤2500	103 (4)	574 (2)	
2501-3999	2425 (93)	22,016 (95)	
≥4000	74 (3)	618 (3)	
Gestational age (weeks)			
37 to 37 ⁺⁶	476 (18)	1903 (8)	
38 to 38 ⁺⁶	1907 (73)	5068 (22)	
39 to 39 ⁺⁶	155 (6)	7360 (32)	
40 to 40 ⁺⁶	46 (2)	5982 (26)	
≥41	18 (1)	2895 (12)	
Total	2602	23,208	

Abbreviations: DM = maternal diabetes mellitus; GDM = gestational diabetes mellitus; IGT = impaired glucose intolerance; SD = standard deviation

(779.8(7)), and pneumothorax (512.8), all of which were diagnoses made by paediatricians.

The collected data were analysed using the Statistical Package for the Social Sciences (Windows version 13.0; SPSS Inc, Chicago [IL], US). Logistic regression analyses were used to compare the risk of respiratory morbidities in babies delivered by elective Caesarean section and vaginally. To evaluate the effect of risk modification by gestational age, stratified analyses were carried out. Data pertaining to the Chinese population only were also analysed. OR with 95% confidence intervals (CIs) were calculated to determine the association between mode of delivery and respiratory morbidities. Adjustment for potential confounders such as maternal history of diabetes metllitus (DM), gestational diabetes mellitus (GDM), and impaired glucose tolerance (IGT) was made to calculate adjusted ORs. A difference was considered statistically significant when the p value was less than 0.05.

Results

During the 6-year study period, there were a total of 31,420 term babies delivered in Tuen Mun Hospital. Around 70% of them had dating scans in our department to confirm the gestational age. Some of the remaining pregnant women had dating scans in the private sector or in China but the exact figure could not be traced from the hospital computer system. All live-birth term singletons without congenital malformations delivered during this period were included in this study, which amounted to 2602 delivered by elective Caesarean section and 23,208 delivered vaginally.

Maternal demographic and obstetric factors are listed in Table 1. Of those delivered by elective Caesarean

section, the majority were delivered before 39 weeks (18% were delivered between 37 and 37⁺⁶ weeks, 73% between 38 and 38⁺⁶ weeks, and 6% between 39 and 39⁺⁶ weeks); 85% were Chinese. The mean maternal age of elective Caesarean section group was 32 years, of whom around 30% were of advanced maternal age. Over 80% of these women were multiparous, but the majority (83%) did not have DM, GDM or IGT.

The total number of term infants suffering from respiratory morbidities was 291 giving an overall frequency of 0.93%. After applying the exclusion of the criteria for special situations, the number of term neonates delivered by elective Caesarean section who had respiratory morbidities was 43 (1.7%) and for those delivered vaginally the number was 178 (0.77%), the difference being statistically significant (p<0.001). Table 2 summarises the different respiratory morbidities encountered in the two groups of infants.

In the general population of Hong Kong, the incidence of combined neonatal respiratory morbidities after elective Caesarean sections performed before 38 weeks of gestation was significantly increased compared to those delivered vaginally (25/1000 births vs 8/1000 births at 37 to 37⁺⁶ weeks; adjusted p=0.006) [Table 3]. This difference was similar to that noted in the Chinese group (23/1000 births vs 8/1000 births; adjusted p=0.008) [Table 3].

Overall, term infants in this study group delivered by elective Caesarean section have an increased risk of combined respiratory morbidity (OR=2.17; 95% CI, 1.6-3.0; p<0.001; adjusted OR=1.89; 95% CI, 1.3-2.7; p=0.001) relative to the vaginal delivery group (Table 2). Infants born by Caesarean section at less than 38 weeks

Respiratory outcome	No. (%) of elective Caesarean section (n=2602)	No. (%) of vaginal delivery (n=23,208)	OR (95% CI); p value	Adjusted OR (95% CI); p value
Total No. of infants with combined respiratory outcome	43 (1.7)	178 (0.77)	2.17 (1.6-3.0); p<0.001	1.89 (1.3-2.7); p=0.001
TTN	36 (1.4)	149 (0.64)	2.16 (1.5-3.1); p<0.001	2.05 (1.4-3.0); p<0.001
RDS	4 (0.2)	16 (0.07)	2.23 (0.7-6.7); p=0.151	1.34 (0.4-4.5); p=0.636
PPHN	0 (0)	4 (0.02)	NA	NA
Pneumothorax	3 (0.1)	9 (0.04)	2.98 (0.8-11); p=0.102	0.32 (0.05-2.0); p=0.226

Table 2. Summary of respiratory outcomes after elective Caesarean section and vaginal delivery in generalpopulation

Abbreviations: OR = odds ratio; CI = confidence interval; NA = not available due to low incidence; TTN = transient tachypnoea of newborn; RDS = respiratory distress syndrome; PPHN = persistent pulmonary hypertension of the newborn

	Combined respira	p Value	p Value*	
	Elective Caesarean section (per 1000 patients)	Vaginal delivery (per 1000 patients)	-	
Total population				
37 to 37 ⁺⁶ week	25	8	0.003	0.006
38 to 38 ⁺⁶ week	16	8	0.007	0.056
39 to 39 ⁺⁶ week	7	6	0.992	0.885
40 to 40^{+6} week	0	8	1	1
≥41 week	0	8	1	1
Chinese population				
37 to 37 ⁺⁶ week	23	8	0.018	0.008
38 to 38 ⁺⁶ week	13	8	0.114	0.114
39 to 39 ⁺⁶ week	8	6	0.839	0.865
40 to 40 ⁺⁶ week	0	9	1	1
≥41 week	0	8	1	1

Table 3. Frequency of combined respiratory morbidity after elective Caesarean section and vaginal deliveryin Hong Kong

^{*} p Value after adjusted for gestational diabetes mellitus / maternal diabetes mellitus / impaired glucose intolerance

Table 4.	Numbers	and odds	ratios o	f selective	e neonatal	respiratory	morbidities	after	elective	Caesarean
section	according	to gestation	on age ir	n the gene	ral Hong K	Kong popula	tion			

Gestation age	Respiratory morbidity*	No. (%) of elective Caesarean section	No. (%) of vaginal delivery	OR (95% CI); p value	Adjusted OR (95% CI); p value
37 to 37 ⁺⁶ week	$Combined^{\dagger}$	12 (2.5)	15 (0.8)	3.26 (1.5-7.0) p=0.003	2.98 (1.4-6.5) p=0.006
	TTN	10 (2.1)	15 (0.8)	2.70 (1.2-6.1) p=0.016	2.43 (1.1-5.6) p=0.037
	RDS	2 (0.4)	0	NA	NA
	PPHN	0	0	NA	NA
	Pneumothorax	0	0	NA	NA
38 to 38 ⁺⁶ week	Combined	30 (1.6)	42 (0.8)	1.91 (1.2-3.1) p=0.007	1.65 (1.0-2.7) p=0.056
	TTN	25 (1.3)	37 (0.7)	1.81 (1.1-3.0) p=0.023	1.68 (1.0-2.8) p=0.049
	RDS	2 (0.1)	2 (0.03)	2.66 (0.4-18.9) p=0.328	1.84 (0.2-14.8) p=0.567
	PPHN	0	1 (0.02)	NA	NA
	Pneumothorax	3 (0.2)	2 (0.04)	NA	NA
39 to 39 ⁺⁶ week	Combined	1 (0.7)	47 (0.6)	1.01 (0.1-7.4) p=0.992	1.16 (0.2-8.5) p=0.885
	TTN	1 (0.7)	35 (0.5)	1.36 (0.2-10) p=0.763	1.36 (0.2-10) p=0.764
	RDS	0	7 (0.1)	NA	NA
	PPHN	0	2 (0.03)	NA	NA
	Pneumothorax	0	3 (0.04)	NA	NA

Abbreviations: OR = odds ratio; CI = confidence interval; NA = not available due to low incidence; TTN = transient tachypnoea of newborn; RDS = respiratory distress syndrome; PPHN = persistent pulmonary hypertension of the newborn

* The ORs and adjusted ORs \geq 40 weeks were not available due to the low incidence

[†] Combined means combined respiratory morbidity (including any of the four diagnoses: TTN, RDS, PPHN, pneumothorax)

also had a significantly higher risk for combined respiratory morbidity (OR for 37^{+0} to $^{+6}$ weeks=3.26; 95% CI, 1.5-7.0, p=0.003) [Table 4]. The adjusted OR was 2.98 (95% CI,

1.4-6.5; p=0.006), which confirmed this finding even after adjustment for maternal history of GDM, IGT, or DM. The adjusted OR for those delivered by elective Caesarean

section between 38 and 38⁺⁶ weeks was also increased, but not significantly (1.65; 95% CI, 1.0-2.7, p=0.056) [Table 4].

Among the four studied respiratory morbidities, TTN was most significantly increased in those delivered by elective Caesarean section before 39 weeks (Table 4), which was confirmed after adjustment for potential confounders (GDM, IGT, and DM).

However, the OR of RDS in infants delivered by elective Caesarean section was only increased at $38^{+0 \text{ to }+6}$ weeks (not statistically significant), while the risk in other gestation groups could not be determined due to the small numbers.

Having examined the risk in general population, the analysis was performed again in Chinese infants using the same exclusion criteria. The total number of infants who had combined respiratory morbidity was 31 (1.4%) in the elective Caesarean section group and 159 (0.8%) in the vaginally delivery group (OR=1.82; 95% CI, 1.2-2.7; p=0.002, and adjusted OR=1.87; 95% CI, 1.3-2.8; p=0.002, respectively). Both combined respiratory morbidity and TTN after elective Caesarean section were found to have similarly increased risks in infants delivered between 37 and 39^{+6} weeks relative to the general population. However, the risks were only statistically significant for those delivered at 37^{+0} to $^{+6}$ weeks and were unchanged after adjustment for potential confounders (Table 5). These results were different from non-Chinese infants in whom the risks for combined respiratory morbidities at 38^{+0} to $^{+6}$ weeks were also significantly increased after elective Caesarean sections (Table 6).

Discussion

Increased risk of respiratory morbidities in term infants delivered by elective Caesarean section of less than 39 weeks has been reported in western countries^{3,4,9-13}. In our study, the relative risk of combined respiratory morbidity after elective Caesarean section was nearly 3 times higher than that of vaginal delivery between 37 and 37⁺⁶ weeks, of which the difference was statistically significant in both the general population and in the Chinese group. However, the increased risk for infants delivered by elective Caesarean section between 38 and 38⁺⁶ weeks was significant in the non-Chinese population but not in Chinese infants. This may suggest racial differences in the timing of lung maturation between Chinese and non-Chinese infants.

Among the four respiratory morbidities, this cohort study showed a statistically significant risk of TTN in

Gestation	Respiratory morbidity*	No. (%) of elective Caesarean section	No. (%) of vaginal delivery	OR (95% CI); p value	Adjusted OR (95% CI); p value
37 to 37 ⁺⁶ week	$Combined^{\dagger}$	9 (2.3)	14 (0.8)	2.78 (1.2-6.5); p=0.018	3.15 (1.3-7.4); p=0.008
	TTN	8 (2)	0	2.47 (1.0-5.9); p=0.043	2.78 (1.2-6.7); p=0.023
	RDS	1 (0.3)	0	NA	NA
38 to 38 ⁺⁶ week	Combined	21 (1.3)	38 (0.8)	1.54 (0.9-2.6); p=0.114	1.55 (0.9-2.7); p=0.114
	TTN	18 (1.1)	33 (0.7)	1.52 (0.9-2.7); p=0.155	1.53 (0.9-2.7); p=0.154
	RDS	1 (0.06)	2 (0.04)	1.39 (0.1-15.3); p=0.789	1.52 (0.1-16.7); p=0.734
	Pneumothorax	2 (0.1)	2 (0.04)	NA	NA
	PPHN	0	1 (0.02)	NA	NA
39 to 39 ⁺⁶ week	Combined	1 (0.8)	41 (0.6)	1.23 (0.2-9.0); p=0.839	1.19 (0.2-8.7); p=0.865
	TTN	1 (0.8)	30 (0.5)	1.68 (0.2-12.4); p=0.610	1.58 (0.2-11.7); p=0.655
	RDS	0	7 (0.1)	NA	NA
	Pneumothorax	0	2 (0.03)	NA	NA
	PPHN	0	2 (0.03)	NA	NA

Table 5. Odds ratios and adjusted odds ratios of selective neonatal respiratory morbidities after elective Caesarean section according to gestation age in the Chinese

Abbreviations: OR = odds ratio; CI = confidence interval; NA = not available due to low incidence; TTN = transient tachypnoea of newborn; RDS = respiratory distress syndrome; PPHN = persistent pulmonary hypertension of the newborn

[∗] The ORs and adjusted ORs for pneumothorax, PPHN ≥40 weeks were not available due to the low incidence

[†] Combined means combined respiratory morbidity (including any of the four diagnoses: TTN, RDS, PPHN, pneumothorax)

Gestation	Respiratory morbidity*	No. (%) of elective Caesarean Section	No. (%) of vaginal delivery	OR (95% CI); p value	Adjusted OR (95% CI); p value
37 to 37 ⁺⁶ week	Combined [†]	3 (3.8)	1 (0.5)	8.3 (0.8-81.3); p=0.068	10.4 (1.1-101.9); p=0.044
	TTN	2 (2.5)	1 (0.5)	5.5 (0.5-61.4); p=0.167	6.8 (0.6-76.4); p=0.12
	RDS	1 (1.3)	0	NA	NA
38 to 38 ⁺⁶ week	Combined	9 (3.3)	4 (0.7)	4.5 (1.4-14.8); p=0.013	4.5 (1.4-14.7); p=0.014
	TTN	6 (2.2)	4 (0.7)	3.0 (0.8-10.6); p=0.094	2.9 (0.8-10.3); p=0.109
	RDS	2 (0.7)	0	NA	NA
	Pneumothorax	1 (0.4)	0	NA	NA
39 to 39 ⁺⁶ week	Combined	0	6 (0.7)	NA	NA
	TTN	0	5 (0.6)	NA	NA
	RDS	0	0	NA	NA
	Pneumothorax	0	1 (0.1)	NA	NA

 Table 6. Odds ratios and adjusted odds ratios of selective neonatal respiratory morbidities after elective

 Caesarean section according to gestation age in the non-Chinese

Abbreviations: OR = odds ratio; CI = confidence interval; NA = not available due to low incidence; TTN = transient tachypnoea of newborn; RDS = respiratory distress syndrome; PPHN = persistent pulmonary hypertension of the newborn

* The ORs and adjusted ORs for pneumothorax ≥40 weeks were not available due to the low incidence

[†] Combined means combined respiratory morbidity (including any of the four diagnoses: TTN, RDS, PPHN, pneumothorax)

the general population after elective Caesarean sections performed before 39 weeks, even after adjustment for potential confounders. This increase may be explained by the lack of an increased level of catecholamine in infants with pre-labour Caesarean sections, which normally reduce fetal lung fluid secretion¹⁴ and the release of surfactants in the fetus during labour¹⁵.

However, the increased risk of combined respiratory morbidity and TTN in the Chinese population was only statistically significant at less than 38 weeks. For infants of 39 weeks, the increased risk, though evident, was not statistically significant, which may be due to insufficient numbers in our study population. In fact, the average number of births per year in our hospital amounts to only about 10% of the total number of births in Hong Kong². A territory-wide study involving all hospitals in Hong Kong may be necessary to obtain a clear picture of the local risks.

Although academic obstetricians and gynaecologists recommend that elective Caesarean delivery should not be performed before 39 weeks of gestation^{5,6}, many obstetricians in our hospital and in other countries are still practising differently; one of the worries being an increased risk of stillbirth. A study involving over 120,000 births by Smith et al¹⁶ estimated that the absolute risk of unexplained stillbirth at or after 39 weeks' gestation was 1.1 per 1000 women with a history of one previous Caesarean section, and 0.5 per 1000 in those with no such history. Smith¹⁷ also studied the risk of perinatal death associated with delivery at term and post term. He found that 38 weeks of gestation was associated with the lowest cumulative risk of perinatal death. The risk of death increased more rapidly among primigravid women after 38 weeks of gestation due to a greater risk of antepartum stillbirths. However, a weakness in that study was that accurate timing of stillbirths was difficult to determine and was generally assumed to be the same as the gestation age at delivery, which may be erroneous. The results should therefore be viewed with caution. Bailit et al¹⁸ studied data from over 110,000 births from National Institutes of Health-funded initiative and found that some neonatal outcomes improved after 39 weeks. Their results suggested that neonatal outcome was optimal at 39 to 40 weeks for all types of delivery.

Delay in timing of delivery, however, may result in an increased number of emergency intrapartum Caesarean sections. In turn this may increase the risk of maternal morbidities from uterine rupture (and even mortality) in women with previous uterine scars or infections, when compared to women having elective Caesarean sections¹⁹⁻²¹. Balchin et al²² found that South Asian women had a higher rate of spontaneous labour before 39 weeks (OR=28.2%; 95% CI, 27.8-28.6) than other ethnic groups. Therefore, elective Caesarean section at 39 weeks of gestation in this group will likely result in a higher proportion of intrapartum Caesarean deliveries in comparison to white women. The absolute risk of perinatal death caused by intrapartum uterine rupture was estimated by Smith et al¹⁶ to be 0.45 per 1000. Due to the above concerns on the risks of delayed delivery, together with the finding that delivery at 38^{+0 to +6} weeks did not show a statistically significant increase in the risk of respiratory morbidities among the Chinese, at this time it is difficult to draw a definite recommendation on the best timing of elective Caesarean section in Hong Kong.

A limitation of this study was that the data were retrieved from the hospital computerised record system; the completeness and accuracy of such records depend on how such information was entered. Moreover, this was a retrospective study, thus the conclusion on whether delaying elective Caesarean section beyond 39 weeks would have led to a higher or lower risk of adverse neonatal outcomes could not be made. Tita et al's study⁴ found a higher risk of adverse neonatal respiratory morbidities in infants delivered beyond 40 weeks of gestation by elective Caesarean section. However, the current study did not show a higher risk in this group of infants.

A randomised controlled trial by ASTECS Research

Team²³, who studied on whether steroids could reduce respiratory distress in term infants born by elective Caesarean section, found that the incidence of TTN was 0.04 in control group and 0.021 in treatment group (relative risk [RR]=0.54; 95% CI, 0.26-1.12), whereas the incidence of RDS was 0.011 in control group and 0.002 in treatment group (RR=0.21; 95% CI, 0.03-1.32). The incidence of infants admitted to special care baby unit due to respiratory distress was 0.051 in the control group and 0.024 in treatment group (RR=0.46; 95% CI, 0.23-0.93). The study therefore concluded that antenatal steroid and delaying delivery until 39 weeks both reduce admissions to special care baby units with respiratory morbidities after elective Caesarean section at term. However, evidence for the safety of antenatal corticosteroids in babies born after 36 weeks of gestation is currently lacking. Elective lower-segment Caesarean section should not normally be performed at early term in preference to administration of antenatal steroids.

Conclusion

The combined respiratory morbidity and TTN of Chinese infants delivered by elective Caesarean section before 38 weeks of gestation was significantly increased. Obstetricians considering elective Caesarean section before 38 weeks should carefully balance these risks and avoid them if possible.

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Corrigendum

In the article "Preoperative Serum CA125 and Extrauterine Disease in Patients with Endometrial Cancer" (July 2011;11:22-9), Dr SK Hui should be the sole author of this paper. We regret the error.