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Timing of Delivery in Multifetal Gestations

Kilpatrick et al., UC San Francisco, 1996

- Retrospective cohort study comparing perinatal mortality of twins to singletons matched for gestational age (≥ 30 weeks)
- Data from all deliveries between January 1976 and July 1993 were analyzed.
- 28417 total births yielded 395 sets of twin delivering at ≥ 30 weeks gestation.

	Singletons	*Twins*	*Significance*
No.	766	766	
Maternal age (yr) (mean ± SD)	27.3 ± 6.0	27.9 ± 5.8	$p = 0.05$
Nulliparous (%)	50	47	$p = 0.47$
Ethnicity (%)			
White	46	54	$p = 0.003$
Black	14	16	
Asian	14	10	
Hispanic	15	13	
Other	11	7	
Maternal transport (%)	25	23	$p = 0.44$
Gestational age at delivery (wk) (mean ± SD)	35.8 ± 3.0	35.8 ± 3.0	$p = 1.0$
Birth weight (gm) (mean ± SD)	2661 ± 770	2357 ± 613	$p = 0.0005$

Maternal and neonatal demographic and descriptive characteristics in singletons and twins after antenatally identified anomalies were excluded. *From:* Kilpatrick: Am J Obstet Gynecol, Volume 174(1).January 1996.66-71

There were no statistically significant differences in maternal age or parity; but, there was a significantly higher proportion of non-white women among singletons. Gestational age at delivery was identical because it was matched. Not surprisingly, birth weight was significantly less in twins compared with singletons.

	Singletons		*Twins*		
Gestational age	*Deaths**	*PNM*	*Deaths*	*PNM*	*Significance*
≥37 wk ($n = 338$)	1	3	2	6	$p = 0.56$
<37 wk ($n = 428$)	31	72	8	19	$p = 0.0002$
TOTAL	32	42	10	13	$p = 0.0005$

PNM, Perinatal mortality.
*Includes stillbirths and neonatal deaths.

Deaths and perinatal mortality (per 1000 live births) by gestational age in singletons and twins. *From:* Kilpatrick: Am J Obstet Gynecol, Volume 174(1).January 1996.66-71

A higher perinatal mortality was observed for singletons (42:1000) than for twins (13:1000).

	Singletons		*Twins*		
Birth weight (gm)	*Deaths**	*PNM*	*Deaths*	*PNM*	*Significance*
<2500	22	73	8	19	$p = 0.000005$
	$n = 300$		$n = 421$		
<1500	13	206	7	91	$p = 0.05$
	$n = 63$		$n = 77$		

PNM, Perinatal mortality.
*Includes stillbirths and neonatal deaths.

Deaths and perinatal mortality (per 1000 live births) by birth weight in singletons and twins. *From:* Kilpatrick: Am J Obstet Gynecol, Volume 174(1).January 1996.66-71

	Singletons			*Twins*		
	SGA	*AGA*	*LGA*	*SGA*	*AGA*	*LGA*
No.*	76	654	36	193	571	2
No. of deaths	8	21	3	7	3	0
PNM†	105	32	83	36	5	0

PNM, Perinatal mortality.
*$p < 0.000005$, distribution of SGA, AGA, and LGA between singletons and twins.
†$0.000005 < p < 0.02$, perinatal mortality in singleton SGA versus twin SGA, singleton AGA versus twin AGA, singleton SGA versus singleton AGA, and twin SGA versus twin AGA.

Perinatal mortality (per 1000 live births) in singletons and twins by SGA, AGA, and LGA . *From:* Kilpatrick: Am J Obstet Gynecol, Volume 174(1).January 1996.66-71

Perinatal mortality in singletons exceeded that for twins when the groups were compared according to birth weight.

Minakami and Sato, Jichi Medical School, Japan 1996

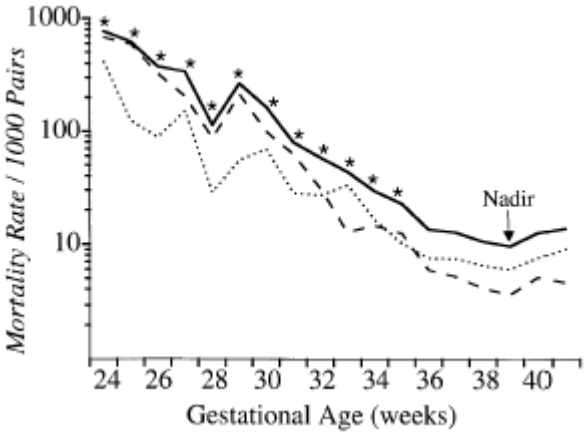
- retrospective study of all 88936 infants born of multifetal pregnancies and all 6020542 infants born of singleton pregnancies that occurred at ≥ 26 weeks between 1989 and 1993 in Japan
- The mean +/- SD duration of pregnancy was 37.0 +/- 2.7 weeks for multifetal pregnancies and 39.6 +/- 1.6 weeks for singleton pregnancies
- In multifetal pregnancies, the incidence of stillbirth and of early neonatal death gradually declined until 37 to 38 weeks' gestation and then increased. These parameters in singleton pregnancies declined until 39 weeks' gestation before increasing.
- The lowest incidence of perinatal death (Stillbirth plus early neonatal death) seen at 38 weeks' gestation in multifetal pregnancies corresponded to that seen at 43 weeks' gestation in singleton pregnancies (10.5 vs. 9.7 per 1000 infants).
- The risk of perinatal death was more than 6 times as high for fetuses of multifetal pregnancies born at 37 weeks or later than for singleton fetuses born at 40 weeks or later (***RR 6.6; 95% confidence internal, 6.1 - 7.1***).

ACOG Educational Bulletin #235 (November 1998)

- Singleton fetal death rates increase significantly at 42 weeks
- Twin fetal death rates increase significantly at 37 weeks.
- Triplet fetal death rates increase significantly at 35 weeks.
- Women with multiple pregnancies should undergo delivery by 40 weeks of gestation; however, this must be weighed against the risks to the fetus if intrauterine life is continued versus the risks to the mother if the pregnancy is continued.

Hartley et al., University of Washington, 1999

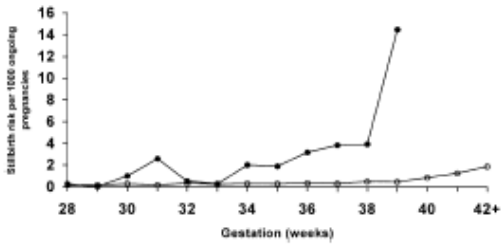
- Objective to determine the gestational age at delivery associated with the lowest rates of perinatal mortality, RDS, and prolonged hospitalization among twins
- Population-based retrospective study of 8150 twin pairs born in Washington state from 1987 to 1997



Perinatal death rate (n = 7903; *solid line*), pair fetal death rate (n = 7903; *dotted line*), and neonatal death rate (n = 7876; *dashed line*) according to gestational age at delivery. *Asterisk,* Week with perinatal mortality rate significantly different from *Nadir*.

Sairam et al, St. George's Hospital Medical School, London, 2002

- Retrospective analysis of birth notifications and infant mortality records relating to all (n=4193 multiple births) multiple gestations to residents of the North Thames region of London from 1989 to 1991. Information was obtained from the Regional Interactive Child Health System; 96% of cases of stillbirth and infant deaths were linked to this registry. These data were compared with singleton pregnancies taken from the same cohort over the same time.
- Information on 4154 multiple gestations was available for analysis.
- Median gestation at delivery in multiple gestations was 37 weeks (6% > 39 weeks)
- Risk of fetal death in multiple gestations increased from 28 to 39 weeks (see Table). The risk of stillbirth in multiple gestations at 39 weeks (10/691) surpassed that of postterm singletons (1 in 526). **RR 7.61 (3.52, 16.4)**



The gestation-specific rate of stillbirth expressed per 1000 ongoing gestations in singleton (*open circles*) and multiple (*filled circles*) gestations. *Sairam. Risk of Stillbirth in Multiple Gestations. Obstet Gynecol 2002.*

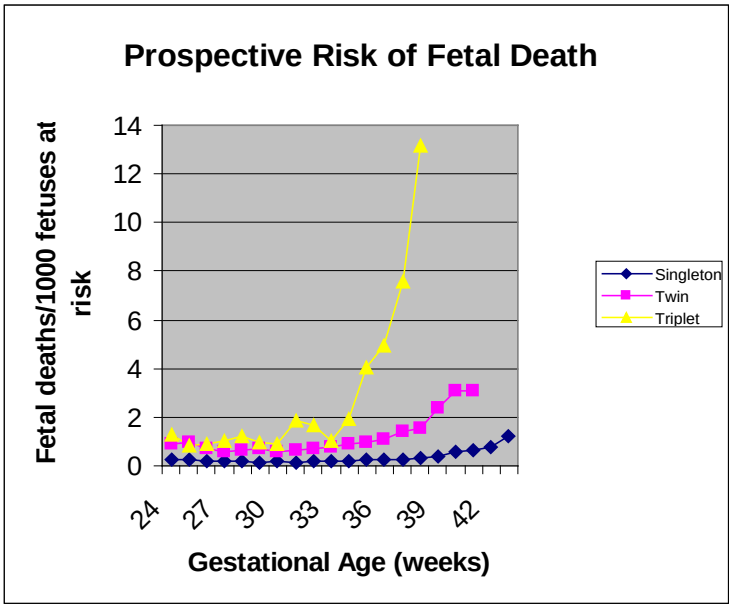
Gestation (wk)	Number of ongoing gestations	Number of stillbirths	Risk of stillbirth per 1000 ongoing gestations (95% CI)	Prospective risk of stillbirth (95% CI)
28	4070	1	0.3 (−0.2, 0.7)	1:3333 (1:5000, 1:1428)
29	4020	0	0*	
30	3974	4	1.0 (0.3, 2.6)	1:1000 (1:3333, 1:384)
31	3898	10	2.6 (1.2, 4.7)	1:384 (1:833, 1:212)
32	3793	2	0.5 (0.01, 1.9)	1:2000 (1:100,000, 1:526)
33	3655	1	0.3 (0.06, 1.5)	1:3333 (1:16,666, 1:666)
34	3493	7	2.0 (0.8, 4.2)	1:500 (1:1250, 1:238)
35	3178	6	1.9 (0.7, 4.1)	1:526 (1:1429, 1:244)
36	2847	9	3.2 (1.4, 6.0)	1:313 (1:714, 1:167)
37	2353	9	3.8 (1.8, 7.3)	1:263 (1:556, 1:137)
38	1527	6	3.9 (1.4, 8.5)	1:256 (1:714, 1:118)
39+	691	10	14.5 (7.0, 26.6)	1:69 (1:143, 1:38)

CI = confidence interval.
* Not calculable.

Number of Ongoing Multiple Gestations and Stillbirths, and Risk of Death per 1000 Ongoing Gestations

Kahn et al., Columbia Preb. Medical Center, 2003

- Retrospective cohort study of 11,061,599 singleton, 297,622 twins, and 15,375 triplet gestations drawn from the 1995-1998 National Center for Health Statistics (CDC).



- Kahn notes that their study in contrast to others (Sairam) starts at an earlier gestational age. In addition, where previous studies demonstrated prospective risk starting low and increasing steadily with advancing age. In their study, prospective risk appeared U-shaped in all three groups.
- According to their data, Kahn postulates that it would be reasonable to consider delivery of twins by 39 weeks to optimize perinatal outcomes. Regarding triplets, consideration should be given for delivery at 36 weeks because at that time the prospective risk of fetal death seems to equal the neonatal death rate

References

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