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Are there any changes in twin deliveries at Songklanagarind Hospital during different periods of time?

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ABSTRACT

Objective To study the incidence and outcomes of twin deliveries in Songklanagarind Hospital during two different periods of time.

Design Retrospective descriptive study

Material and methods A hundred and thirty-three twin pregnant women who delivered before the ART programme (1982-1991) were reviewed and compared with 137 twin ases who delivered after the ART programme (1992-1997).

Results The incidence of twin deliveries was 9.6 and 9.3 per 1,000 births before and after the ART programme, respectively. Maternal age, preterm delivery rate and cesarean section rate were higher in the after ART period, significantly. Mean gestational age at delivery was 36.9 and 35.8 weeks in the before and after ART period, respectively. The mean birth weight of 1st and 2nd twin in the before ART period were 2,393 and 2,304 gm. which were higher compared to 2,266 and 2,217 gm. in the after ART period. However, perinatal mortality rate was lower in the after ART period (36/1,000 v.s. 70/1,000) by the reduction of early neonatal death rate.

Conclusion Twin delivery rate in Songklanagarind Hospital was not changed during 1982-1997. Some unfavourable outcomes increased in the latter period.

Key words : twin deliveries, Songklanagarind Hospital, twin

In 1978, the first baby born after in vitro fertilization (IVF) was reported by Edwards and Steptoe.[1] Since then, assisted reproductive technologies (ART) have become widely accepted and used in the treatment of infertility. Within the United States and Canada, in 1993 alone, 41,209 cycles of ART and 6,869 embryo transfer procedures resulted in 8,741 deliveries, with almost 20% of these pregnancies being twin gestations.[2] Multiple pregnancy rate from IVF was estimated around 35% (28% twins and 6% triplets or more).[3] This consequence was related to superovulation and number of embryos transferred. In IVF, the pregnancy rate and twin pregnancies were maximum when 3-4 embryos were transferred.[4] Twin delivery rate has been rising in several countries since the 1970s.[5-7] The emergence of ART and increasing use of ovulation induction agents contribute to this progression.[8,9]

The ART programme which included intrauterine insemination (IUI) and gamete intrafallopian transfer (GIFT) has been settled in Songklanagarind Hospital since 1990 and the first GIFT baby was reported in 1991.[10] Then, IVF programme was started in 1994 and succeed in 1997. Our

objective of this study was to compare the incidence and outcomes of twin deliveries in the period before the ART programme to those after the ART programme.

Materials and Methods

Twin deliveries in Songklanagarind Hospital from 1982 to 1997 were reviewed and devided into two groups; 133 pregnant women who delivered before the ART programme (1982-1991) and 137 cases who delivered after the ART programme (1992-1997). The incidence, maternal characteristics and outcomes of deliveries were compared by X^2 or two-tailed Fisher exact test if the expected cell frequencies were small. The level of statistical significance was $P < 0.05$.

Results

The incidence of twin deliveries was 9.6 and 9.3 per 1,000 births in the before and after ART programme, respectively. It was constant while the incidence of triplet deliveries increased from 0.6 per 1,000 births in 1988 to 1.5 per 1,000 births in 1997 (Fig. 1,2). Only 6.6% (9/137) of twin deliveries in the after ART period were conceived by IUI(4 cases), GIFT (4 cases) and IVF (1 case) while 88% (7/8) of triplets born in the same period were conceived by GIFT (5 cases) and IVF (2 cases).

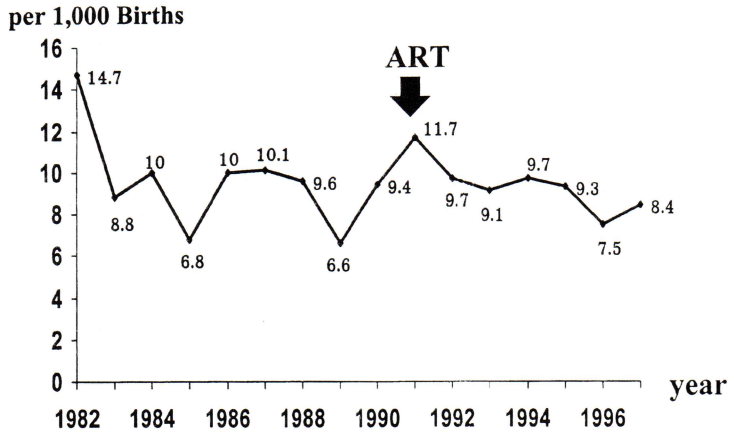

Fig. 1. Incidence of twin deliveries.

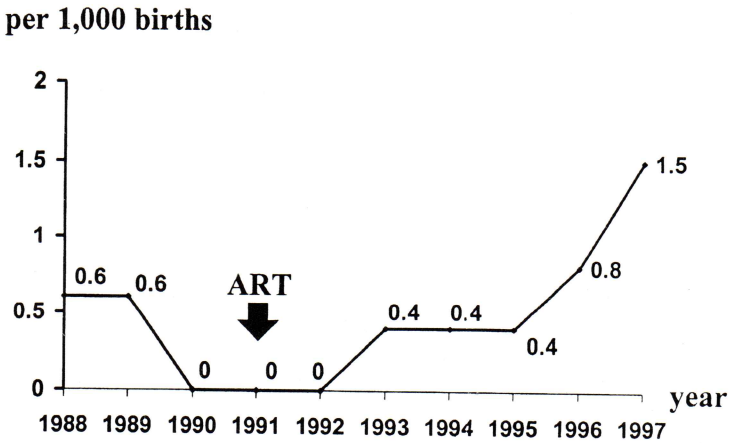

Fig. 2. Incidence of triplets.

Maternal age was slightly higher in the after ART period. There were 43% and 41% of nulliparous in each group, respectively which was not statistical different (Table1). Mean gestational age at delivery was 36.9 ± 2.9 weeks in the before ART period compared to 35.8 ± 2.7 weeks in the after ART period. Preterm delivery rate was significant higher in the after ART period (51% v.s. 27%). The cesarean delivery was more frequent in the after ART period (71% v.s. 57%). Fourty-two percent of these in the before ART period were performed because of non-vertex twin B. In the after ART period, the common indications of cesarean delivery were non-vertex twin A and non-vertex twin B (Table 2).

Birth weights of twins were significantly higher in the before ART period than in the after ART period. There were no statistical difference in frequencies of low birth weight, very low birth weight and discordant birth weight (Table 3).

The rate of low Apgar score (< 7) at 1 and 5 minute were similar for the first and second twins in both groups. Perinatal mortality rate was 36 per 1,000 births in the after ART period which was nearly half of that in the before ART period. This was due to no early neonatal death in the after ART period (Table 4).

Table 1. Age and parity of twin deliveries

	Before ART n = 133	**After ART** n = 137	**P-value**
Age (yrs)	28.5 +/-4.9	29.3 +/-4.6	0.0000*
Parity			
Nulliparous	43%	41%	0.741
Multiparous	57%	59%	0.741

* = significant (P<0.05)

Table 2. Outcomes of twin deliveries

	Before ART n = 133	**After ART** n = 137	**P-value**
GA at deliveries(wks)	36.9 +/-2.9	35.8 +/-2.7	0.0000*
Preterm delivery rate (< 37 wks)	27%	51%	0.0000*
Mode of deliveries (for both of twins)			
Normal labour	27%	15%	0.037*
Cesarean section	57%	71%	0.039*
Others (V/E, F/E, Breech assisting)	16%	14%	0.656
Indication of C/S			
Previous C/S	12%	8%	0.41
Non-Vx twin A	12%	23%	0.11
Non-Vx twin B	42%	22%	0.007*
Dystocia	7%	8%	0.78
Others (PROM, PIH, Fetal distress, Placenta previa)	27%	39%	0.042*

* = Significant (P<0.05)

Table 3. Birthweights

	Before ART n = 133	After ART n = 137	P-value
Birthweight (gm.)			
First twin	2,393 +/-536	2,266 +/-557	0.000*
Second twin	2,304 +/-621	2,217 +/-507	0.000*
LBW			
(< 2,500 gm)	56%	65%	0.15
VLBW			
(< 1,500 gm)	8.6%	9.2%	0.89
Discordant			
(> 25%)	11.2%	14.6%	0.5

* = Significant (P<0.05)

Table 4. Perinatal outcomes

	Before ART n = 133	After ART n = 137	P-value
Low Apgar score (<7)			
First twin			
1 minute	16.7%	8%	0.05
5 minute	2.4%	5.1%	0.34
Second twin			
1 minute	17.2%	13.9%	0.54
5 minute	3.2%	5.8%	0.40
Perinatal mortality rate	70/1,000	36/1,000	0.000*
Stillbirth rate	45/1,000	36/1,000	0.36
Early neonatal death rate (< = 7 days)	25/1,000	0/1,000	0.000*

* = Significant (P<0.05)

Discussion

The trend of multiple deliveries has been increasing in many countries. Twin delivery rate in France has been rising from 9.8 per 1,000 births in 1965 to 11.2 per 1,000 births in 1989.[11] The more increasing rate was observed in triplet delivery rate which started to rise from 0.9/10,000 in 1972 to 4.4/10,000 in 1989.[11] The trend of triplets was correlated well with the pattern of human menopausal gonadotrophin (HMG) sales in France in the same period.[11] In our study, twin delivery rate was not increased from 1982 to 1997 while triplet delivery rate showed a sharp increase in 1996. Though the ART programme in our hospital has been settled since 1990, it has not affected twin deliveries as much as triplet deliveries. This can be explained by the ratio of twin deliveries resulted from the ART was only 6.6% of total twin deliveries in the study period. In contrary, triplet deliveries resulted from the ART were 88% of total triplet deliveries. This distribution was different from Buvat's report in 1990 the proportion of twins and triplets after assisted conceptions was 4.1% and 25.9%, respectively.[12]

Steegers-Theunissen et al studied the preva-

lence of multiple births in Netherlands from 1970 to 1995 and found it has increased significantly from three possible causes; introduction of assisted reproductive techniques in combination with fertility drugs, increasing maternal age, and decreasing fecundity with increasing maternal age, resulting in more fertility treatments.[13] Mean maternal age in the after ART period in our study was slightly higher compared with the before ART period. This trend was the same as Jewell's study which showed the rates of twin and triplet births rose from the years 1980-1989 and increased maternal age was a significant factor.[14]

There are some outcomes which were significant higher in the after ART period such as preterm delivery rate and cesarean section rate. We cannot analyse the causes of these differences whether they had any associations with the ART programme. However, Bernasko et al reported no different in preterm deliveries in twins conceived by IVF or GIFT, but elective cesarean deliveries were increased approximately 4 times in this group.[15] Most of indications for cesarean section in our study were fetal malpresentation in both periods.

Mean birth weight of twins born after the ART period was significant lower than before the ART period. This can be explained by lower mean gestational age at deliveries and higher frequency of preterm delivery rate in the after ART period.

Neonatal outcomes in both groups were similar except no early neonatal death in the after ART period which resulted in lower perinatal mortality rate. Improved NICU and more experienced neonatologists may affect these outcomes.

Mean gestational age at delivery, preterm delivery rate, mean birth weight and frequencies of very low birth weight in the after ART period (1992-1997) were similar as in twins delivered in the United States of America during 1991-1995.[16]

In conclusion, the ART programme in our hospital does not affect the incidence of twin deliveries because the ratio of twins following IVF or GIFT was less than 10%. The differences in some outcomes could be due to different periods of study or other unknown factors. A larger cohort of twin pregnancies conceived by ART should be studied to evaluate these associations.

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