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INTRODUCTION

WHO estimates that 8–12% of couples around the world experience difficulty conceiving a child. Approximately one in five (20%) couples will experience infertility or the inability of a couple to conceive or carry to a live birth pregnancy after one year of regular sexual relations without the use of contraceptives.

Assisted conception refers to pregnancies achieved by Clomiphene citrate (Clomid) induced ovulation or via assisted reproductive technology (ART). ART refers to methods used by infertile couples to achieve pregnancy through artificial means. Examples of ART include in vitro fertilization (IVF), intra-cytoplasmic sperm injection (ICSI), cryopreservation, and intrauterine insemination (IUI).

OBJECTIVE & METHODOLOGY

To compare the pregnancy outcome of assisted conception which includes Clomid induced, intrauterine insemination (IUI), in-vitro fertilization (IVF) and intra-cytoplasmic sperm injection (ICSI) pregnancies versus spontaneous conception achieved in 14 hospitals in Malaysia.

Data were obtained retrospectively from the National Obstetrics Registry from 1st January 2011 to 31st December 2012. A total of 260,959 deliveries were analysed (134,931 in 2011 and 124,431 in 2012). In this study, we analysed 1633 (2011) and 1109 (2012) cases of assisted conception vs. 133,298 (2011) and 123,322 (2012) spontaneous conception. Main outcome measures were incidence of clinical pregnancy, prematurity, mode of delivery, APGAR score at 5min <7, stillbirth, birth weight and multiple pregnancies.

Pearson's chi-squared test (χ^2) was used to determine the statistical significance of differences observed between the discrete variables. The difference or association was considered to be statistically significant if $P \leq 0.05$.

RESULTS

The total percentage of assisted conception deliveries in 2011 and 2012 was 1.2% and 0.9% respectively. Hospital Pulau Pinang had the highest pregnancy conceived through assisted conception in both years, 2011 (5.3%) and 2012 (14.1%). (Table 1).

Table 1. Assisted conception vs. spontaneous conception in the participating hospitals

Participating hospitals	2011					2012				
	Total conception	Spontaneous conception		Assisted Conception		Total conception	Spontaneous conception		Assisted Conception	
	n	n	%	n	%	n	n	%	n	%
Hospital Sultanah Aminah	12347	12320	99.8	27	0.2	12474	12432	99.7	42	0.3
Hospital Sultanah Bahiyah	10365	10254	98.9	111	1.1	10481	10406	99.3	75	0.7
Hospital Raja Perempuan Zainab II	12973	12947	99.8	26	0.2	11100	11092	99.9	8	0.1
Hospital Melaka	10796	10390	96.2	406	3.8	10882	10731	98.6	151	1.4
Hospital Tuanku Jaafar	4817	4803	99.7	14	0.3	6273	6265	99.9	8	0.1
Hospital Tengku Ampuan Afzan	9218	9078	98.5	140	1.5	8897	8818	99.1	79	0.9
Hospital Raja Permaisuri Bainun	6210	6179	99.5	31	0.5	4606	4589	99.6	17	0.4
Hospital Tuanku Fauziah	4202	4004	95.3	198	4.7	4026	3945	98.0	81	2.0
Hospital Pulau Pinang	3340	3164	94.7	176	5.3	3102	2665	85.9	437	14.1
Hospital Likas	14918	14837	99.5	81	0.5	13869	13829	99.7	40	0.3
Hospital Umum Sarawak	9875	9610	97.3	265	2.7	1555	1522	97.9	33	2.1
Hospital Tengku Ampuan Rahimah	12383	12346	99.7	37	0.3	12218	12197	99.8	21	0.2
Hospital Sultanah Nur Zahirah	11913	11823	99.2	90	0.8	12952	12859	99.3	93	0.7
Hospital Kuala Lumpur	11574	11543	99.7	31	0.3	11996	11972	99.8	24	0.2
Total	134931	133298	98.8	1633	1.2	124431	123322	99.1	1109	0.9

The Caesarean section rates were significantly higher in assisted conception vs. spontaneous conception. In 2011, 50.4% of assisted conception pregnancy were delivered via caesarean section vs. 23.7% and 68.9% vs. 25.1% in 2012 with $P < 0.001$. (Table 2).

Table 2. Mode of delivery

Mode of delivery	No of deliveries	2011				*stat	No of deliveries	2012				*stat
		Assisted		Spontaneous				Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
Vaginal	96858	730	46.5	94,610	72.6	<0.001	86825	328	30.1	86,625	71.1	<0.001
Caesarean	32036	791	50.4	30,903	23.7		31122	750	68.9	30,567	25.1	
Instrumental	4943	49	3.1	4,813	3.7		4616	11	1.0	4,608	3.8	
Total	133837	1570	100.0	130,326	100.0		122563	1089	100.0	121,800	100.0	

As for prematurity, we see higher premature birth in assisted conception ($P < 0.001$) as there were 13.1% (2011) and 17% (2012) as compared to spontaneous conception which was 11% (2011) and 11.8% (2012) respectively (Table 3). Babies born with birth weight lesser than 3000 grams were 54.9% in assisted vs. 53.5% in spontaneous conception and 55.5% (2012) vs. 52.7% in spontaneous (Table 4). Stillbirths were almost similar in both years, 0.81% vs. 0.78% in 2011 and 0.55% vs. 0.78% in 2012 (Table 5). APGAR at 5 min below 7 were also similar in both years, 2.0% vs. 1.9% in 2011 and 1.8% vs. 1.4% in 2012 (Table 6).

Table 3. Complication of premature delivery in assisted vs. spontaneous conception.

Complications of pregnancy/Delivery	2011					P	2012					P
	Total premature	Assisted		Spontaneous			Total premature	Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
Prematurity	14,967	214	13.1	14,601	11.0	<0.001	14,641	188	17.0	14,498	11.8	<0.001
Total Conception		1633		133,298				1109		123,322		

Table 4. Baby born less than 3 Kg in assisted vs. spontaneous conception.

Birth weight	2011					P	2012					P
	Total	Assisted		Spontaneous			Total	Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
<=1000	1,246	23	1.4	1,190	0.9		1,187	17	1.5	1,173	1.0	
1001-1500	1,501	37	2.3	1,449	1.1		1,388	31	2.8	1,362	1.1	
1501-2000	3,843	65	4.0	3,718	2.8		3,451	65	5.9	3,397	2.8	
2001-2500	16,194	203	12.4	15,766	11.8		14,492	165	14.9	14,373	11.7	
2501-3000	50,450	568	34.8	49,197	36.9		44,894	337	30.4	44,674	36.2	
Total	73,234	896	54.9	71,320	53.5	NS	65,412	615	55.5	64,979	52.7	NS
Total Conception	136,863	1,633		133,298				1,109		123,322		

Table 5. Still birth in assisted vs. spontaneous conception.

Stillbirth	2011					P	2012					P
	Total	Assisted		Spontaneous			Total	Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
Yes	1,046	13	0.81	1,026	0.78	NS	956	6	0.55	951	0.78	NS
No	134,056	1,586	99.19	130,544	99.22		122,030	1,090	99.45	121,271	99.22	
Total	135,102	1,599	100.00	131,570	100.00		122,986	1,096	100.00	122,222	100.00	

Table 6. APGAR score in 5 min lesser than 7 in assisted vs. spontaneous conception.

Apgar score @ 5mins	2011					P	2012					P
	Total	Assisted		Spontaneous			Total	Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
<7	2,587	33	2.0	2,540	1.9	NS	1,733	20	1.8	1,718	1.4	NS
Total		1,633		133,298				1,109		123,322		

However, incidence of multiple pregnancies was higher with assisted conception versus spontaneous conception with 4% vs. 1.9% and 6.9% vs. 2% in 2011 and 2012 respectively and it was statistically significant ($P < 0.0001$). (Table 7)

Table 7. Multiple pregnancy in assisted vs. spontaneous conception

Multiple pregnancy	2011					P	2012					P
	Total deliveries	Assisted		Spontaneous			Total deliveries	Assisted		Spontaneous		
	n	n	%	n	%	n	n	%	n	%		
Singleton	134,168	1,567	96.0	130,707	98.1	<0.001	121,512	1,033	93.1	120,798	98.0	<0.001
Multiple	2,695	66	4.0	2,591	1.9		2,584	76	6.9	2,524	2.0	
Twins	2,576	48	2.9	2,490	1.9		2,472	58	5.2	2,424	2.0	
Triplets	75	18	1.1	57	0.0		108	18	1.6	96	0.1	
Others	44	0	0.0	44	0.0		4	0	0.0	4	0.0	
Total	136,863	1,633	100.0	133,298	100.0		124,096	1,109	100.0	123,322	100.0	

LIMITATIONS

Limitation of this study: the data from the NOR may not capture the actual number of mothers who took Clomid or underwent other types of ART. Fertility history obtained from case notes may be incomplete.

DISCUSSION

In order to achieve better pregnancy rates, fertility drugs are given to increase the number of oocytes per cycle. This, however, is associated with a greater risk of multiple pregnancies. In our study, there was a significantly higher multiple gestations in assisted compared with spontaneous conception (double in 2011 and triple in 2012). Furthermore, assisted conception showed a significantly higher caesarean section rate as well as premature deliveries. These findings were comparable to many studies looking at similar outcome. Conversely, other studies have shown that adverse perinatal outcomes, such as low birth weight and low APGAR scores are increased after assisted conception compared with spontaneously conceived pregnancies. However, our data showed that such complications were low.

CONCLUSION

The risk of multiple pregnancy, Caesarean section and premature delivery increases in women conceived through assisted conception.

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