



Growth pattern and development of premature infants in diabetes and gestational diabetes

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Purpose

To investigate the growth pattern and developmental status of premature infants in diabetic and gestational diabetic mothers.

Methods

This study was based on data of premature infants with Korean Neonatal Network (KNN). KNN is a nationwide web-based network targeting very low birth weight infants weighting less than 1,500g. The growth patterns, developmental scale, and disease morbidity of newborns delivered in diabetic and gestational diabetic mothers were compared and analyzed with the normal group. Growth patterns were compared based on the percentile of body weight at birth and at 18 months of follow-up. For the developmental scale, the Bailey's developmental scale was used, which evaluates the mental, motor, and behavioral rating scales of infants and young children. In addition, at the time of 18 months of follow-up, rehospitalization, rehabilitation and speech treatment, ophthalmic disease, hearing impairment, and cerebral palsy were evaluated.

Results

A total of 6,808 very low birth weight infants have been registered in KNN, and 1,54 cases was followed up after 18 months after birth. Among them, 114 infants (91.2%) were in the normal group, 92 (7.5%) in the GDM group, and 16 (1.3%) in the DM group. Maternal age and neonatal birth weight in each group showed a statistically significant difference ($p < 0.001$; $p = 0.002$, respectively). As a results of comparing the birth weight with the weight at 19 months, it was found that the birth weight statistically significantly affects the weight at 18 months in the DM group ($p = 0.012$). However, it showed that there was no statistically significant effect in the GDM group ($p = 0.294$). Moreover, there was no statistically significant difference between the normal, DM, and GMD group in Bailey's developmental test results and other disease morbidity.

Conclusion

Preterm infants in the GDM group showed different growth pattern form those in the normal group. However, there were no developmental problems in the preterm infants of diabetic and gestational diabetic group compared to normal group

Table 1. Baseline Characteristics

		Normal (N=1144)	GDM (N=94)	DM (N=16)	P-value
Maternal age (yr)		32.9 ± 4.15	34.4 ± 3.60	36.1 ± 3.70	<0.001
Parity	Primi	726 (63.5%)	58 (61.7%)	9 (56.3%)	0.796
	multi	418 (36.5%)	36 (38.3%)	7 (43.8%)	
Fetal N	Singleton	737 (64.4%)	59 (62.8%)	13 (81.3%)	0.248
	Twin	353 (30.9%)	35 (37.2%)	3 (18.8%)	
	triplet	54 (4.8%)	0 (0.0%)	0 (0.0%)	

Table 2. Obstetric Outcomes

		정상 (N=1144)	GDM (N=94)	DM (N=16)	P-value
Gestational age at delivery (weeks)		28.6 ± 2.81	29.0 ± 2.28	29.8 ± 2.76	0.119
Birth weight (g)		1101.6 ± 257.7	1189.9 ± 234.97	1210.9 ± 201.76	0.002
Mode of Delivery	Vaginal delivery	233 (20.4%)	27 (28.7%)	3 (18.8%)	0.157
	Cesarean section	911 (79.6%)	67 (71.3%)	13 (81.3%)	
PPROM		382 (33.4%)	41 (43.6%)	5 (31.3%)	0.359

Table 3. Growth Patterns

(A) Normal Group

(B) GDM

(C) DM

정상군	방문시체중					총계	X ² (p)	임신성 당뇨	방문시체중					총계	X ² (p)	임신성 당뇨	방문시체중					총계	X ² (p)		
	<10 %	10-25 %	25-75 %	75-90 %	> 90%				<10 %	10-25 %	25-75 %	75-90 %	> 90%				<10 %	10-25 %	25-75 %	75-90 %	> 90%				
출생시 체중	명	95	52	77	11	5	240	명	5	4	4	1	0	14	명	3	1	1	0	0	5				
<10 %	%	39.6%	21.7%	32.1%	4.6%	2.1%	100.0	<10 %	%	35.7%	28.6%	28.6%	7.1%	0.0%	100.0	<10 %	%	60.0%	20.0%	20.0%	0.0%	0.0%	100.0		
10-25 %	명	36	34	68	10	6	154	10-25 %	명	5	1	4	1	0	11	10-25 %	명	0	0	1	0	0	1		
%	%	23.4%	22.1%	44.2%	6.5%	3.9%	100.0	%	%	45.5%	9.1%	36.4%	9.1%	0.0%	100.0	%	%	0.0%	0.0%	100.0	0.0%	0.0%	100.0		
25-75 %	명	74	96	293	73	34	570	25-75 %	명	6	9	25	5	7	52	25-75 %	명	0	4	2	0	1	7		
%	%	13.0%	16.8%	51.4%	12.8%	6.0%	100.0	%	%	11.5%	17.3%	48.1%	9.6%	13.5%	100.0	%	%	0.0%	57.1%	28.6%	0.0%	14.3%	100.0		
75-90 %	명	17	17	67	23	24	148	75-90 %	명	1	3	5	2	2	13	75-90 %	명	0	0	0	0	1	1		
%	%	11.5%	11.5%	45.3%	15.5%	16.2%	100.0	%	%	7.7%	23.1%	38.5%	15.4%	15.4%	100.0	%	%	0.0%	0.0%	0.0%	0.0%	100.0	100.0		
> 90%	명	0	3	11	12	6	32	> 90%	명	0	0	3	1	0	4	> 90%	명	0	0	0	2	0	2		
%	%	0.0%	9.4%	34.4%	37.5%	18.8%	100.0	%	%	0.0%	0.0%	75.0%	25.0%	0.0%	100.0	%	%	0.0%	0.0%	0.0%	100.0	0.0%	100.0		