

Maternal risk factors of type 1 diabetes mellitus among children in Babylon province,2015

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Introduction

Type 1 diabetes mellitus is a chronic multifactorial disease, it is an increasing public health problem in developed and developing countries. The etiology of this disease is uncertain , several maternal, neonatal and environmental risk factors might play an important role in its development, the goal of any disease prediction is prevention.

Type 1 diabetes mellitus is the major type of diabetes in youth, accounting for $\geq 85\%$ of all diabetes cases in individual younger than 20 years of age .

Recent study estimates that the number of new cases(incidence) of T1DM is increasing at rate of approximately 3% per year in different countries around the world.

The high and increasing incidence, associated with severe morbidity, mortality and enormous health care expenditures, makes T1DM a prime target for prevention. Environmental triggers such as certain dietary factors and viruses are thought to initiate the autoimmune process, leading to the destruction of pancreatic B-cell and consequent T1DM. A genetic predisposition is another pre-requisite, allowing the autoimmune process to progress.

A number of maternal-related events are associated with an increased disease risk in children such as Increase maternal age at delivery ,maternal gestational diabetes mellitus ,pre-eclampsia and smoking etc.....

In developing countries studies about risk factors of type 1 diabetes mellitus are limited.

Objective

The objective of this study was to identify the associations of type 1 diabetes mellitus with some maternal potential risk factors

This is a hospital based case control study conducted on 150 children who were diagnosed as type1 diabetic patients(cases), their age range was 1-15 years all of them were attended or admitted to diabetic center in Marjan teaching hospital and Babylon children and maternity hospital. Age matched 300 children as control group were selected randomly from children who attended or admitted these hospitals due to other diseases from and proved by blood test to be diabetes free.

Interview about maternal factors included; maternal smoking, maternal age at delivery , parity. pre-eclampsia and gestational DM. In addition to, history of drug ingestion during pregnancy ,such as antihypertensive , non steroidal anti-inflammatory drugs and folic acid intake.

Data were collected single handy by the same investigator from child's parents using a structured questionnaire.

This study was conducted over the period from the beginning of February 2015 to the end of June ,2015

Statistical analysis was done using SPSS version 17, data were expressed and comparisons of was performed using Chi square.

For each variable the Odds Ratio (OR) and 95% confidence interval (CI) were assessed. , $p < 0.05$ was proportions considered as statistically significant.

Family history of diabetes and autoimmune diseases among diabetic patients and control groups.

Variable	Study Groups		χ^2	P values	Odds Ratio (95% C.I.)
	cases (%)	Control (%)			
Family History of DM Positive Negative	92 (61.3) 58 (38.7)	64 (21.3) 236(78.7)	70.644	<0.001	5.849 (3.808-8.985)
Family History of Autoimmune Diseases Thyroid disease Celiac disease Negative**	25 (16.7) 8 (5.3) 117 (78.0)	8 (2.7) 7 (2.3) 285 (95.0)	28.8 2.7	0.001 0.095	7.300 (3.205-16.628) 2.358 (0.839-6.632)

Potential risk factors during pregnancy of the index child

Variable	Study Groups		χ^2	P values	Odds Ratio (95% C.I.)
	cases (%)	Control (%)			
Mothers' smoking habit					
Smoker	9 (6.0)	3 (1.0)	9.632	0.002	6.319 (1.685-23.701)
Non-Smoker	141 (94.0)	297 (99.0)			
Fathers' smoking habit					
Smokers	93 (62.0)	144 (48.0)	7.862	0.005	1.768 (1.185-2.637)
Non-Smokers	57 (38.0)	156 (52.0)			
Maternal diseases during pregnancy					
Pre-Eclampsia	40 (26.7)	30 (10.0)	21.14	0.001	3.273(1.94-5.52)
Gestational DM	11 (7.3)	4 (1.3)	11.17	0.001	5.865 (1.832-18.718)
None	99 (64.7)	266 (88.4)			

Drug use of mothers during pregnancy among diabetic patients and control groups.

Drugs consumption during pregnancy					
Antihypertensive drugs	41 (25.3)	30 (9.3)	20.455	0.001	3.296 (1.929- 5.630)
NSAID	10 (5.3)	4 (1.0)	7.874	0.005	5.577 (1.458-21.341)
None	99(60.8)	266(74.5)			
Using of folic acid during pregnancy					
Yes	58 (38.7)	187 (62.3)	22.583	<0.001	2.625 (1.745-3.928)
No	92 (61.3)	113 (37.7)			

Maternal related factors during pregnancy among diabetic patients and control groups.

Parity					
< 3	74 (49.3)	218 (72.7)	23.897	<0.001	2.730 (1.815-4.108)
≥ 3	76 (50.7)	82 (27.3)			
Maternal age at delivery					
<35 years	54(37.7)	228(85.2)	24.236	<0.001	2.970(3.732-4.501)
≥35 years	96(62.3)	72(14.8)			
ANC					
Present	94 (62.7)	170 (56.7)	1.485	0.223	1.284 (0.859-1.919)
Absent	56 (37.3)	130 (43.3)			

Distribution of cases and control groups by mode of delivery

Variable	Study Groups		χ^2	P Values	Odds Ratio (95% C.I.)
	cases (%)	Control (%)			
Mode of delivery NVD C/S	61 (40.7) 89 (59.3)	259 (86.3) 41 (13.7)	101.51	<0.001	9.217 (5.799-14.648)

Distribution of some risk factors among the study group

Gestational age Term ≥ 37weeks Preterm < 37weeks	148 (98.7) 2 (1.3)	299 (99.7) 1 (0.3)	1.510	0.219	0.247 (0.022-2.752)
Type of Feeding Breast feeding Formula feeding Mixed feeding	65 (43.3) 43 (28.7) 42 (28.0)	193 (64.3) 23 (7.7) 84 (28.0)	18.028 35.236	0.001 0.001	0.424 (0.284-0.633) 4.840 (2.783-8.416)

Conclusion

Some maternal factors were associated significantly with type 1 diabetes mellitus such as family history of diabetes , history of immune diseases, smoking including passive tobacco smoke , not taking folic acid during pregnancy , consuming drugs (anti hypertensive and non steroidal anti inflammatory) by pregnant women. delivery by cesarean section , and artificial breast feeding , no association was detected between the development of this disease and anti natal care visits.

