The Epidemiology of Type 1 Diabetes in Thai Children

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Abstract

The incidence of type 1 diabetes in children aged 0-15 years in Thailand was reported to be as low as 0.2/100,000/year in 1984-1985. This survey from 1991 to 1995 by the same investigators using the same questionnaires distributed to hospitals in every province demonstrated increasing numbers. In Bangkok, the capital city, a survey was done by using the capture-recapture method, and found a significant incidence of 1.65/100,000/yr. This number is equal to the incidence in other countries in Asia. This result might be effectively considered as an exact incidence rate during this decade.

Key word : IDDM, Type 1 DM, Incidence

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Insulin Dependent Diabetes Mellitus (IDDM) or type 1 diabetes in children is characterized by severe insulinopenia and dependence on exogenous insulin to prevent ketosis and to preserve life. IDDM is not a benign disease; many patients suffer from the disease physically and mentally. The highest annual average incidence of IDDM has been reported in Finland (28.6/100,000) and the lowest is in Asia[1].

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In Thailand, the incidence of IDDM in children aged 0-15 years in 1984-1985[2] was 0.2/100,000/year which seemed to be the lowest in the world.

Lately, the authors have observed more newly diagnosed IDDM in Thai children and decided to study the incidence of IDDM in various regions of Thailand from 1991 to 1995 compared to the study in 1984-1985[2].

MATERIAL AND METHOD

Multicenter studies were conducted separately in the Northern, Northeastern, Southern and Central part of Thailand by using the same questionnaires distributed to government and private hospitals in every province of Thailand.

The information included name, age, sex, address, birth date and date of first insulin injection. The inclusion criteria for IDDM (type 1 diabetes) are related to report of the committee on the diagnosis and classification of diabetes mellitus 1998[3]. The exclusion criteria were in patient who were diagnosed with type 2 diabetes, other type and cases who had not required insulin injection. All new cases of IDDM diagnosed from 1991 to 1995 (aged 0-15 years) were reported. Patients diagnosed prior to 1991 or after 1995 were not included in this study.

The population of children under 15 years old was 25 percentile of the total population. The official Thai census of population and housing of 1995 was used as the source of data for the calculation of the age-corrected incidence in the regions and the whole Kingdom of Thailand.

In addition to the multi-center studies of the 4 regions of Thailand, a study was conducted differently in Bangkok-Noi district by using the hospital medical record information, reconfirmed by second ascertainment of information from all pediatric and adult endocrinologists in Bangkok and by third ascertainment of information from primary and secondary school in the Bangkok metropolitan area as the capture-recapture method[4].

RESULTS

Table 1, 2, 3 show the surprising findings of the incidence of IDDM in the Northern, Northeastern and Southern parts from 1991 to 1995, the percentage of questionnaire response was 80-85 per cent.

Table 4 shows the incidence of newly-diagnosed IDDM in the Central region from 1991 to 1995, the percentage of questionnaire response was lower at only 50 per cent.

Table 1. Incidence of IDDM in Northern Thailand.

	Population under 15 years	IDDM (cases)	Incidence per 100,000
1991	2,768,935	10	0.36
1992	2,920,579	9	0.31
1993	2,953,584	10	0.34
1994	2,978,101	10	0.24
1995	2,974,082	10	0.24

Table 2 Incidence of IDDM in Northeastern Thailand.

	Population under 15 years	IDDM (cases)	Incidence per 100,000
1991	5,425,384	13	0.24
1992	4,913,049	16	0.30
1993	5,042,746	17	0.34
1994	5,135,595	16	0.31
1995	5,158,299	15	0.30

Table 3 Incidence of IDDM in Southern part of Thailand.

	Population under 15 years	IDDM (cases)	Incidence per 100,000
1991	1,909,529	5	0.26
1992	1,850,500	10	0.54
1993	1,869,500	8	0.43
1994	1,900,825	10	0.42
1995	1,926,552	9	0.46

Table 4. Incidence of IDDM in Central Thailand.

	Population under 15 years	IDDM (cases)	Incidence per 100,000
1991	1,629,975	1	0.06
1992	2,148,553	1	0.05
1993	2,177,959	3	0.14
1994	2,145,420	9	0.42
1995	3,352,311	9	0.27

However, compared with the previous studies in 1984-1985, there was a significant rise in incidence in three regions of Thailand (Table 5) from 1991 to 1995.

The study from 4 hospitals in the Bangkok Noi district reconfirmed by second ascertainment of pediatric and adult endocrinologists (76% response rate) and third ascertainment for primary and secondary school (100% response rate) showed a significantly higher incidence, the average incidence from 1991 to 1995 was 1.65/100,000/yr. This result did not compare with the incidence from those regions due to the different methodology (Table 6).

Table 5 Comparison of the incidence of IDDM studied previously.

	1984	1985	1991 - 1995
North	0.17	0.06	0.27
Northeast	0.17	0.11	0.30
Central	0.29	0.25	0.20
South	0.12	0.12	0.42

Table 6 Incidence of IDDM in Bangkok Noi district, central part of Thailand.

	Population under 15 years	IDDM (cases)	Incidence per 100,000
1991	45,808	1	2.18
1992	50,416	-	0
1993	50,732	1	1.97
1994	48,627	1	2.06
1995	48,909	1	2.04

Information from 4 hospitals in Bangkok-Noi district, 78 pediatric and adult endocrinologists, and all primary-secondary schools in the Bangkok metropolitan area for recording ascertainment. The average incidence was 1.65/100,000 per year.

DISCUSSION

Thailand has a population of approximately 60 million of which around 8 million live in the capital city, Bangkok. The population under the age of 15 years is 15 million. (25% of the total population). Infant mortality rate is 30.8 per 1000 live births. Life expectancy is 66 years for males, 71 years for females.

In 1984-1985, the incidence of IDDM in Thailand was reported to be 0.2/100,000 year(2). This was based on the survey of the population aged 15 years and below. From this study, the apparent increase of incidence was observed over a ten year period since 1984-1985.

In the present study, there was better cooperation from doctors answering the questionnaires in three regions which were Northern, Northeastern and Southern part of Thailand, the response rate varied from 80-85 per cent. While the response rate in the Central region was only 50 per cent.

The Northeastern region revealed the same finding as the Northern region, the incidence was almost 2 fold increased. In the Southern region, there was an apparent increase of incidence compared to other regions of Thailand. Environmental factors such as different social and cultural lifestyles of the three different regions of Thailand cannot be excluded as contributing factors.

In the Central region, the incidence had not increased significantly which might be due to inadequate response of physicians answering the questionnaires. The response rate was only 50 per cent while the response rate from other regions was 80-85 per cent.

Table 7. Incidence of type 1 diabetes among different populations in Asian Countries (100,000/yr).

Japan	: Hokkaido	:	2.07 (Kitagawa T. et al : 1994)(5)
	Tokyo	:	1.65 (Kitagawa T. et al : 1994)
	Yokohama	:	1.66 (Kitagawa T. et al : 1994)
	Osaka	:	1.78 (Kitagawa T. et al : 1994)
	Kagoshima	:	1.93 (Kitagawa T. et al : 1994)
Korea	: Seoul	:	0.7 (Ko KW. et al : 1994)(6)
China	: Shanghai	:	0.96 (Wang H. et al 1996)(7)
	Hong Kong	:	1.7 (Wong GW. 1994)(8)
Thailand	: Bangkok	:	1.65 (the present study)

Another interesting observation in the present study was that the highest incidence was found in Bangkok Noi district which is situated in Bangkok, in the Central region of Thailand. The method of survey in this area was different as mentioned before and called the capture- recapture method(4) This method was accepted as the best method for epidemiological study.

The incidence of 1.65/100,000/year in this area seems to be much higher when compared to other regions which used by only single question-

naires. This may be the real incidence of Bangkok. Thai children in Bangkok are more westernized in their lifestyles, food habits and consumerism. These factors might play some role in the increasing trend of IDDM. This hospital-based study ascertained by the capture-recapture method could not compare with the previous study in 1984, 1985[2] due to the different method of epidemiological study. However, the average incidence of IDDM in Bangkok was 1.65/100,000/year, which was similar to the incidence of IDDM in other Asian countries as shown in Table 7. For confirmation, a newly diagnosed diabetes registry database is urgently required.

The finding of a gradually increasing incidence of IDDM has been observed around the world [9-13] as well as obesity induced type 2 diabetes or NIDDM in children[14,15]. This is quite alarming and is becoming a serious problem in health care management.

The increased incidence of IDDM in Thai children over a ten year period since 1984-1985 may however be real. If so, this would have important implications for the planning of public health programs related to control and prevention of childhood IDDM in Thailand.

SUMMARY

The incidence of IDDM in Thai children aged 0-15 years was studied from 1991 to 1995 by multicenter studies using the same questionnaires. This study compared with a previous study done in 1984-1985 which demonstrated an increased incidence of IDDM in the last 10 years. These significant changes were observed in the North, Northeastern and Southern regions of Thailand.

The study from hospital medical records with second and third ascertainment by the capture and recapture method revealed a high incidence in Bangkok Noi district in Central Thailand.

IDDM, believed to be rare in Thailand, is now increasing rapidly. This has implications for planning of public health programs related to further epidemiological study for future control and prevention of diabetes in children.

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ระบาดวิทยาของผู้ป่วยโรคเบาหวานในเด็กไทยชนิดพึ่งอินสุลิน

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โรคเบาหวานในเด็กชนิดที่ 1 หรือ ชนิดพึ่งอินสุลินชื่อเดิม Insulin Dependent Diabetes Mellitus (IDDM) ซึ่งเคยศึกษามาพบอุบัติการณ์ต่ำในประเทศไทย และต่ำที่สุดในโลกเมื่อปี พ.ศ. 2527-2528 กลุ่มแพทย์ ผู้ชำนาญการโรคเบาหวานในเด็กพบว่ามีผู้ป่วยเด็กเป็นโรคนี้มากขึ้นในค่าการศึกษาร่วมกันในภาคต่าง ๆ ของประเทศคือ ภาคกลาง ภาคเหนือ ภาคตะวันออกเฉียงเหนือ ภาคใต้ โดยใช้แบบสอบถามเดียวกัน ศึกษาผู้ป่วยใหม่ที่เป็นโรคนี้ในระหว่างปี พ.ศ. 2534-2538 ในกลุ่มเด็กอายุ 0-15 ปี พบมีอุบัติการณ์เพิ่มขึ้นชัดเจนเมื่อเปรียบเทียบกับ 10 ปีที่ผ่านมา และผลการศึกษาจากห้องรายงานของโรงพยาบาลต่าง ๆ ของภาคการศึกษาผู้ป่วยเด็กที่มีถิ่นฐานเขตบางกอกน้อย รวมกับ แบบสอบถามแพทย์เฉพาะทางและข้อมูลจากโรงเรียนต่าง ๆ ทั่วกรุงเทพมหานคร พบมีอุบัติการณ์เป็น 1.65/แสน/คน/ปี ซึ่งเทียบเคียงได้กับอุบัติการณ์ของหลายประเทศในทวีปเอเชีย

ดังนั้นโรคเบาหวานชนิดที่ 1 หรือ IDDM ซึ่งเคยเชื่อกันว่าพบน้อยในเด็กไทยนั้นมีแนวโน้มที่จะพบมากขึ้นในปัจจุบันและอนาคต การแพทย์และสาธารณสุขไทยจึงควรมีการวางแผนศึกษาด้านระบาดวิทยาการขึ้นทะเบียนโรค เพื่อนำไปสู่การรวบรวมฐานข้อมูลอุบัติการณ์ของโรคที่ถูกต้อง การรักษาควบคุมและป้องกันโรคเบาหวานในเด็กต่อไป

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