Comparison of incidence of micro vascular complications in patients with youth onset type 1 and type 2 diabetes in India

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Background

There is a global deficiency in the literature pertaining to burden of complications in youth onset diabetes with a notable scarcity in the Asian countries.

Objectives

- ❖ To estimate the incidence of micro vascular complications (any form of diabetic retinopathy, neuropathy and nephropathy) among patients with youth onset diabetes in India.
- ❖ To compare the incidence of micro vascular complications among youth onset type 1 and type 2 diabetes.

Methods

- ❖ The study was conducted among a sub population of patients with youth onset type 1 and type 2 diabetes enrolled under the Registry of people with diabetes in India with young age at the onset (YDR).
- ❖ The baseline data of YDR patients collected between 1st January 2001 and 31st December 2012 and follow up data collected till 31st December 2014 were used to estimate the incidence of chronic diabetes complications.
- ❖ The final sample comprised of those who were aged >10 years at registration with no evidence of micro vascular complication of interest at baseline and had undergone at least one follow up visit during the above study period.
- ❖ The presence or absence of diabetic retinopathy was confirmed after a dilated fundus examination with direct ophthalmoscope confirmed by an experienced physician or ophthalmologist.
- ❖ The diabetic neuropathy status was assessed by clinical examination and monofilament test.
- ❖ Patients were labelled to have diabetic nephropathy if 24 hour urine protein excretion was greater than 500mg or urine albumin excretion was greater than 300mg.
- ❖ Data of patients with type 1 (n=799) and type 2 (n=371) diabetes were analysed. The incidence rate of all the three micro vascular complications and that of presence of any one microvascular complication were significantly higher among patients with type 2 diabetes compared to type 1 diabetes (Table-1 & Figure-1).
- ❖ 17.1 % of patients with type 1 diabetes developed at least one micro vascular complication during the fourteen years of follow up.
- ❖ Among patients with type 2 diabetes, the proportion was much higher with 33.5% of the patients developing at least one micro vascular complication during the follow up period.
- ❖ In the multivariable Cox regression analysis, the high risk for incidence of micro vascular complications in type 2 diabetes patients was independent of the diabetes duration and clinical characteristics such as obesity, high blood pressure and glycaemic control at baseline (Table-2).

Table-1: Incidence of micro vascular complications in youth onset diabetes

	At risk (n)	Events(n)	Person years	Incidence per 1000 person years
Diabetic retinopathy				
Type 1 diabetes	644	84	3291.3	25.5 (20.6, 31.6)
Type 2 diabetes	164	43	709.5	60.6 (45.0, 81.7)
Diabetic neuropathy				
Type 1 diabetes	638	36	3321.6	10.8 (7.8, 15.0)
Type 2 diabetes	152	34	697.4	48.8 (34.8, 68.2)
Diabetic nephropathy				
Type 1 diabetes	663	32	3473.3	9.2 (6.5, 13.0)
Type 2 diabetes	195	21	926.4	22.7 (14.8, 34.8)
Any micro vascular complication				
Type 1 diabetes	716	122	3063.0	39.8 (33.4, 47.6)
Type 2 diabetes	224	75	750.6	99.9 (79.7, 125.3)

Figure-1: Kaplan Meier survival curves

Table-2: Type of diabetes and microvascular complications- Results of Cox regression analysis

	Adjusted* hazard ratio (95% CI)	P value
Diabetic Retinopathy		
Type 1 diabetes	Ref	
Type 2 diabetes	2.8 (1.8, 4.3)	<0.0001
Diabetic Neuropathy		
Type 1 diabetes	Ref	
Type 2 diabetes	3.7 (2.0, 7.0)	<0.0001
Diabetic Nephropathy		
Type 1 diabetes	Ref	
Type 2 diabetes	2.5 (1.2, 5.0)	0.01

*Adjusted for age, gender, duration of diabetes since diagnosis, obesity, high blood pressure and glycaemic control.

Conclusions

- ❖ The study reports a high incidence of microvascular complications among youth onset diabetes patients in India with an excess among youth onset type 2 diabetes.
- ❖ This is similar to that reported by the SEARCH Registry for youth onset diabetes in the US.

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