**Long term complications of childhood-onset type 1 diabetes and age at diagnosis**

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Aim: Recent studies hypothesised that onset of type 1 diabetes (T1D) before age 7 indicates more severe disease. This study examines incidence of long-term complications amongst people with childhood-onset T1D, and association between age-of-onset and risk of complications.

Methods: People diagnosed with T1D aged <16 years old (y.o). in New South Wales (NSW) between 1990-2009 were identified from the Australasian Paediatric Endocrine Group (APEG) dataset. APEG data were linked to NSW Hospital, Emergency Department and Medicare Benefit Schedule data from 2001-2019 to identify cardiac, eye, lower limb and kidney complications. Age-of-onset of T1D was categorised: <7, 7-12, 13-16 years. Cox regression models were used to calculate Hazard ratios (HR) and 95% confidence intervals (95%CI) for the risk of complications from age 16-34 years, adjusting for year of diagnosis, socio-demographics and acute complications.

Results: Of 5,202 people with T1D; 1,694 (32.6%) were diagnosed age <7y.o., 2,537 (48.8%) 7-12y.o. and 971 (18.7%) 13-16y.o. Median follow-up was 15 years. Incidence of complications between 16-34y.o. (per 10,000 person-years) was 14.9 for cardiac, 107.9 for eye, 70.5 for severe retinopathy, 59.3 for lower limb and 73.8 for kidney complications. T1D-onset <7y.o. was associated with increased risk of severe retinopathy (aHR 1.60; 95%CI 1.13-2.25), vs T1D-onset 13-16y.o. (see Table).

**Table: Association between age at onset of T1D and risk of long-term complications**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age T1D onset (years)** | **Cardiac complications** | **Eye Complications** | **Lower limb complications** | **Kidney complications** |
| ***Any retinopathy*** | ***Severe Retinopathy*** | ***Vascular Complications*** | ***Peripheral Neuropathy*** |
| **Adj HR****(95%CI)** | **Adj HR (95%CI)** | **Adj HR (95%CI)** | **Adj HR (95%CI)** | **Adj HR (95%CI)** | **Adj HR****(95%CI)** |
| **<7 yrs** | 0.93 (0.43-2.03) | 1.26 (0.95-1.67) | **1.60 (1.13-2.25)** | 0.88 (0.46-1.68) | 1.17 (0.65-2.13) | 1.06 (0.77-1.47) |
| **7-12** | 1.06 (0.63-1.80) | 1.12 (0.90-1.39) | 1.24 (0.95-1.62) | 1.09 (0.72- 1.64) | 1.17 (0.77-1.77) | 0.86 (0.67-1.10) |
| **13-16** | Reference | Reference | Reference | Reference | Reference | Reference |

Conclusion: People diagnosed with T1D <7y.o had increased risk of severe retinopathy before 35y.o. This may be due to more severe disease or longer duration T1D and requires additional complication-related screening and support.