Epidemiology of Type1 Diabetes Over Five Decades: The Winchester Cohort Study

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BACKGROUND

A secondary care Diabetes Clinic was set up in 1983 by one of us (APB) to serve the population of Winchester, Eastleigh, and Andover covering 12 postcodes, 6 urban and 6 rural. 1983 was the year in which the insulin preparations of all people with Type1 Diabetes (Type1DM patients) were changed to uniform U100 strength ("U100 Conversion"). It is likely that all people with Type1 Diabetes in this population were seen either at the Royal Hampshire County Hospital in the newly formed Diabetic Clinic, or by visits to General Practice, and subsequently at least 95% attended the hospital Clinics. Furthermore, from 1983 to 2010 (when the 3 central Diabetes Clinics were closed by the then Hampshire Primary Care Trust) a similar percentage of newly diagnosed adults (over 16 years of age) were referred. Other patients diagnosed at a younger age came through to the adult clinics over these decades.

From 1995 onwards clinical data from attendance at the Diabetes Clinics (visits once or twice a year including an Annual Review) was captured in the Diamond Database (HiCom technology) to use for audit purposes, as the basis for GP and Specialist letters, and to store laboratory and other test results.

METHODS

Clinical data from the summary record, last annual review letter nearest to April 2010, summaries of clinic attendance, drug history, and laboratory results, has been extracted onto a series of spread sheets for analysis, supplemented by the extensive personal knowledge of the patients and their families gathered during long term follow up. In this analysis observations are reported on: age at diagnosis; presence of a family history of Diabetes in a first degree relative; hypothyroidism diagnosed on clinical grounds and serum TSH (miu/L) at annual review; and Coeliac Disease (diagnosed on clinical grounds confirmed by biopsy). Patients have been assigned to their decade of diagnosis, and data is presented for the five decades 1961-70, 1971-80, 1981-90, 1991-2000, and 2001-2010. Ascertainment is likely to be best for the three decades between 1971 and 2000. There is no statistical analysis, but simple arithmetical display of results and conclusions.

RESULTS

These are presented in three tables viz: Table1 Age of onset by decade of diagnosis;

Table 2 Presence of family history of Diabetes in a first degree relative by decade of diagnosis; and Table 3 Prevalence of co-morbid hypothyroidism or Coeliac Disease by decade of diagnosis. There are 675 records available of which 613, 313 males and 300 females, live in the relevant postcodes and were diagnosed in the five decades.

Table 1. Age of Onset by decade of diagnosis

Parameter	Decade 1961-70	Decade 1971-80	Decade 1981-90	Decade 1991-2000	Decade 2001-10	Totals
Numbers	66 (29M/37F)	118 (63M/55F)	158 (78M/80F)	157 (72M/85F)	114 (71M/43F)	613 (313/300)
Mean age of onset	18.5 yrs.	18.3 yrs.	23.4 yrs.	28.2 yrs.	30.9 yrs.	
Range (years)	0.7 to 53.5	1.3 to 52.5	0.2 to 62.1	4.5 to 73.1	10.8to68.3	
No./% age 0.0-19.9	43/65.2%	72/61.0%	73/46.2%	52/33.1%	26/22.8%	
No./% age 20.0-39.9	18/27.3%	36/30.5%	60/38.0%	72/45.9%	62/54.4	
No./% age 40.0-59.9	5/7.5%	10/8.5%	24/15.2%	29/18.5%	23/20.2%	
No./% age 60.0-79.9	0/0%	0/0%	1/0.6%	4/2.5%	3/2.6%	

Table 2. Family history of Diabetes in first degree relative by decade of diagnosis

Parameter	Decade 1961-70	Decade 1971-80	Decade 1981-1990	Decade 1991-2000	Decade 2001-10
Numbers of probands of total cases.	7 of 66	9 of 118	27 of 158	19 of 157	11 of 114
% and risk	10.6% and 1 in 10 circa	7.6% and 1 in 13 circa	17.1% and 1 in 6 circa	12.15 and 1 in 8 circa	9.65 and 1 in 11 circa
Males (M)/ Females (F)	2M/5F	4M/5F	18M/9F	9M/10F	6M/5F

Table 3. Prevalence of hypothyroidism and Coeliac Disease by decade of diagnosis

Parameter	Decade 1961-70	Decade 1971-80	Decade 1981-90	Decade 1991-2000	Decade 2001-10
Hypothyroid numbers and percentages.	16 of 66 24.2%	31 of 118 26.3%	20 of 158 12.7%	14 of 146 9.6%	7 of 90 7.8%
Nos. males / Nos. females	4M / 12F	11M / 20F	3M / 17F	5M / 9F	1M / 6F
Nos. of Coeliac Disease.	0M/ 3F	0M / 0F	0M / 0F	0M / 1F	1M / 0F

CONCLUSIONS

1. When Type1 Diabetes was described as "Juvenile Diabetes" the peak age of Onset was given as 7-17 years. In the Winchester cohort of White Caucasian Anglo-Saxons the age at onset appears to be increasing, with a change in age distribution, so that the most common 20 year quartile for age at onset is 20.0-39.9 years. Type1 Diabetes frequently begins over 40 years of age (14.5% or 1 in 7 overall), but over 60 remains rare. This is important to consider when seeing patients with new onset Diabetes and in screening programmes.

2. A family history of Diabetes in a first degree relative occurred in between 1 in 6 and 1 in 13 index cases, of whom 40 were males and 33 females.

3. Only 5 cases (1 in 313 males and 4 in 300 females) of Coeliac Disease were diagnosed, making screening (e.g. with antibody levels) of asymptomatic individuals unlikely to be cost effective in such a population.

4. Hypothyroidism (with levothyroxine replacement dose =/>100 mcg/day) is frequent in females (64 cases in 300 = 21.3%; males 24 in 313 = 7.7%) and should be screened for with annual serum TSH levels and on symptoms.