

SEXUAL MEDICINE

Is Type 1 Diabetes Mellitus More Prevalent Than Expected in Transgender Persons? A Local Observation

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ABSTRACT

The International Diabetes Federation estimates that approximately 0.4% of the Belgian population is diagnosed with type 1 diabetes mellitus, which is similar to other industrialized countries. The prevalence of transgenderism is estimated at 0.6% to 0.7% of all adults in Western populations. In this study, we evaluated whether there was an increased prevalence of type 1 diabetes mellitus in transgender people in the local cohort. Medical records of transgender patients were analyzed retrospectively. From January 1, 2007 until October 10, 2016, 1,081 transgender patients presented at a tertiary reference center to start hormonal treatment. Nine of these 1,081 patients were previously diagnosed with type 1 diabetes mellitus and 1 was diagnosed with latent autoimmune diabetes in adults. A 2.3-fold higher prevalence of type 1 diabetes mellitus was observed in transgender patients. We concluded that type 1 diabetes mellitus was more prevalent in transgender patients than one would expect from population prevalences. This could be a spurious result in a local cohort, because a causal relation seems unlikely, but our finding might encourage other centers to investigate this putative association. **Defreyne J, De Bacquer D, Shadid S, et al. Is Type 1 Diabetes Mellitus More Prevalent Than Expected in Transgender Persons? A Local Observation. Sex Med 2017;X:XXX–XXX.**

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Key Words: Transgender; Type 1 Diabetes Mellitus; Epidemiology

INTRODUCTION

At the Ghent University Hospital outpatient endocrine clinic (Ghent, Belgium), recognized as a tertiary referral center for transgender care, we perceived a relatively high prevalence of type 1 diabetes mellitus in transgender individuals seeking gender-affirming hormonal treatment. However, there is no known association between type 1 diabetes mellitus and transgenderism.

In Belgium, the prevalence of type 1 diabetes mellitus in the Belgian population is estimated at 0.4% by the International Diabetes Federation (IDF), which is similar to the prevalence rate of type 1 diabetes mellitus in the Netherlands (0.48%).¹ Exact incidence rates are unknown, because newly diagnosed cases are not systematically documented in Belgium.

Previous studies on the prevalence of transgenderism reported mainly on the prevalence of transgender persons looking for

gender-affirming care, which led to an underestimation of the prevalence of transgenderism.² In a recent study by Van Caenegem et al,² the overall prevalence of transgenderism in Flanders, Belgium was estimated at 0.6% to 0.7% of all adults.

Theoretically, the options for gender affirmation include social, psychological, hormonal, and surgical transitioning, although decisions regarding gender-affirmative therapy should be made for the individual. Options for gender-affirming hormonal treatment include testosterone administration (intramuscular injections or gel applications) in transmen and estrogens (orally or transdermally administrated) and antiandrogens in transwomen.

Given the relatively low prevalence of transgenderism and type 1 diabetes mellitus, combined prevalence in one person is expected to be rare. Therefore, we evaluated whether the number of transgender persons with the comorbidity of type 1 diabetes mellitus was higher than expected in our center.

METHODS

To evaluate a possible association between type 1 diabetes mellitus and transgenderism in our local cohort, medical records of transgender persons were analyzed retrospectively. To investigate whether the difference between expected and

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observed numbers of transgender persons presenting with type 1 diabetes mellitus was significant, a χ^2 statistical test ($[\text{observed} - \text{expected}]^2/\text{expected}$) was performed using IDF estimates.

RESULTS

From January 1, 2007 until October 10, 2016, 1,081 transgender persons and 372 patients with type 1 diabetes mellitus presented at the endocrinology department of our hospital. We found that 9 of 1,081 transgender persons were previously diagnosed with type 1 diabetes mellitus and 1 person was previously diagnosed with latent autoimmune diabetes of adulthood, a form of type 1 diabetes mellitus that develops later in adulthood (Table 1). Of these transgender individuals, eight (80%) were transwomen (male-to-female transgender persons) and two (20%) were transmen (female-to-male transgender persons). Their mean age was 36.7 years (range = 19–53 years) and mean age at diagnosis of type 1 diabetes mellitus was 15.7 years (range = 3–29 years). Five transgender persons recalled their first feelings of gender incongruence at a mean age of 6.8 years (range = 4–13 years). For two persons, this information was not found in the medical records, one did not recall, and two persons responded that they felt this way since “early childhood.” The reported trans-persons started gender-affirming hormonal therapy at mean age of 29.4 years (range = 19–50 years). The expected number of persons previously diagnosed with type 1 diabetes mellitus presenting for transgender care was 4.32 ($1,081 \times 0.4\%$). The calculated χ^2 statistic of 7.47 ($P = .006$) indicated that the higher prevalence of type 1 diabetes mellitus in transgender individuals (0.92%) was highly significant (2.3 times higher; Figure 1).

DISCUSSION

We found an increased number of transgender persons with type 1 diabetes mellitus at our center compared with the expectation based on the combined prevalence of transgenderism and type 1 diabetes mellitus in Western populations. Because not all transgender persons wish or search for gender-affirming hormonal treatment, this number could be an underestimation.²

The predominant effector mechanism of type 1 diabetes mellitus is autoimmunity, although the primary cause is unknown.³ There are case reports describing other autoimmune diseases in transgender persons, although those researchers correlated their observations with the administered hormonal therapy, whereas in our patients type 1 diabetes mellitus was already prevalent before initiation of hormonal therapy.^{4,5}

A possible pathophysiologic mechanism behind the observed correlation between type 1 diabetes mellitus and transgenderism is difficult to fathom, if only because the etiology of transgenderism remains unclear. Etiologic theories include atypical gender development during childhood and parental and familial, genetic, and biological factors.⁶ Because the incidence of type 1

Table 1. Characteristics of transgender persons with a history of type 1 diabetes mellitus presenting at the Ghent University Hospital Department of Endocrinology

Patient ID	Desired gender	Birth year	Age at onset of gender dysphoria (y)	Age at onset of T1DM (y)	Age at start of CSHT (y)	Insulin therapy	HbA _{1c} (%)	C-peptide (nmol/L)	Height (cm)	Weight (kg)	BMI (kg/m ²)
1	Female	1991	13	14	23	Basal bolus	9.4		181	60	18.31
2	Female	1983	Unknown	9	20	Basal bolus	9		182	78	23.5
3	Female	1963	6	3	37	Basal bolus	7		178		
4*	Male	1972	4	29	22	Basal bolus	6		170	61	21.1
5	Female	1990	7	14	20	Basal bolus	10	0.10	186.5	90.5	26
6	Female	1979	Unknown	11	31	Basal bolus	8.7		188	118.5	33.5
7	Female	1981	“Early childhood”	25	27	Basal bolus		<0.03	169.8	91.8	31.8
8	Female	1997	4	12	19	Basal bolus			171	49	16.8
9	Female	1966	“Early childhood”	14	50	Basal bolus	6.7		172	67.6	22.9
10	Male	1982	Unknown	29	34	Insulin pump	7.1	0.01	168	71	25.2

BMI = body mass index; CSHT = cross-sex hormone therapy; HbA_{1c} = hemoglobin A_{1c}; T1DM = type 1 diabetes mellitus.

*Patient was diagnosed with latent autoimmune diabetes in adults.

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