Arch Sex Behav (2017) 46:1307–1312
DOI 10.1007/s10508-017-0955-z

ORIGINAL PAPER

Prevalence, Incidence, and Sex Ratio of Transsexualism in the Autonomous Region of Madrid (Spain) According to Healthcare Demand

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Received: 6 May 2016 / Revised: 31 January 2017 / Accepted: 1 February 2017 / Published online: 21 February 2017

Abstract In recent years, different studies have provided estimates of the prevalence of transsexualism with very diverse results. The purpose of this study was to ascertain the prevalence, incidence, and sex ratio of transsexualism in the autonomous region of Madrid (Spain). A total of 1234 patients who attended from 2007 to the end of 2015 in the only Gender Identity Unit (GIU) in Madrid were analyzed. Sixty-three patients were excluded for various reasons; thus, 1171 could be included: 803 male-to-female (MtF) and 368 female-to-male (FtM) transsexual patients. Transsexualism was diagnosed based on the ICD-10, World Health Organization, 1992, and/or gender identity disorder based on the DSM-IV-TR, American Psychiatric Association, 2000. The demographic statistics were calculated on the basis of the population over 15 years old of Madrid. Based on healthcare demand, the prevalence of transsexualism was 22.1 in 100,000 inhabitants: 31.2 for MtF and 12.9 for FtM, making the MtF/FtM ratio approximately 2.2:1. The incidence rate was 2.5 in 100,000 inhabitants, representing an annual average of 130 demands. Although transsexualism occurs in all countries with different rates of prevalence, in our area, this prevalence was higher than reported from other European countries. We believe that two main circumstances might influence this high prevalence: the easy accessibility and the absence of a waiting list to the GIU, and the permissive social and legal climate and openness of Spain, especially in Madrid.

Keywords Transsexualism · Gender dysphoria · Sex ratio

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Introduction

Transsexualism is defined as a discrepancy between normal somatic sexual differentiation as male or female and gender identity. Transsexuals have the firm belief that they belong to the opposite sex. This conviction is generally associated with the irresistible need to live as the sex to which a person feels like he/she belongs (Bullough, 1975); for this, they require hormonal, legal, surgical, and psychosocial adjustments. To ascertain the prevalence of transsexualism is essential for proper planning of health services and policymaking, though this can be complex due to several factors.

The first difficulties in estimating the actual prevalence are related to the terminology used. The diagnosis of "gender identity disorder" comes from DSM-IV (American Psychiatric Association, 1994). After this publication, several studies were conducted following these criteria (see Table 1). However, the diagnosis of transsexualism, included in the ICD-10 (World Health Organization, 1992), would also have been applicable to most of these patients.

Table 1 Studies reviewed on prevalence, incidence, and sex ratio of transsexualism

Author	Year	Country	Total	Incidence of 100,000/ year	Prevalence of 100,000	MtF of 100,000	FtM of 100,000	Sex ratio MtF/ FtM
Wålinder	1967	Sweden	110		1.42	2.70	0.97	2.8:1
Pauly	1968	USA			0.40	1.00	0.25	4:1
Wålinder	1971	Sweden	27	0.15	0.45	0.44	0.44	1:1
Hoenig and Kenna	1974	England and Wales	66	0.17–0.26	1.92	2.94	0.92	3.2:1
Sörensen and Hertoft	1980	Denmark		0.21				2.8:1
Ross et al.	1981	Australia	272	0.58	2.40	4.16	0.66	6.1:1
O'Gorman	1982	Northern Ireland	28		1.92	2.85	1.00	2.8:1
Eklund et al.	1988	The Netherlands	538		2.77	5.55	1.85	3:1
Godlewski	1988	Poland	26					1:5.5
Tsoi	1988	Singapore	458	1.58	23.60	35.20	12.00	3:1
Bakker et al.	1993	The Netherlands	713		4.42	8.40	3.28	2.5:1
van Kesteren et al.	1996	The Netherlands	998		8.05	12.11	4.30	3:1
Weitze and Osburg	1996	West Germany	733	0.21–0.24	2.10	2.38	0.96	2.3:1
Landén et al.	1996	Sweden	233	0.17	3.42	4.03	2.83	1.4:1
Wilson et al.	1999	Scotland	160		4.79	7.82	1.92	4:1
Garrels et al.	2000	Germany	1773		n/a	n/a	n/a	1.2:1
Olsson and Möller	2003	Sweden	402	0.19–0.26	5.91	7.34	4.54	1.6:1
Gómez-Gil et al.	2006	Spain (Catalonia)	182	0.73	3.88	4.75	2.07	2.6:1
Esteva et al.	2006	Spain (Andalusia)	437			10.32	6.47	1.6:1
De Cuypere et al.	2007	Belgium	412		4.28	7.75	2.95	2.4:1
Okabe et al.	2008	Japan	579					0.7:1
Vujovic et al.	2009	Serbia	147		2.25	2.23	2.27	1:1
Baba et al.	2011	Japan	342			3.97	8.2	1:2
Ahmadzad-Asl et al.	2011	Iran	281			0.70	0.73	1:1
Dhejne et al.	2014	Sweden	681		16.67	11.57	6.64	1.6:1
Judge et al.	2014	Ireland	218		6.77	9.84	3.61	2.7:1

In May 2013, DSM-5 (American Psychiatric Association, 2013) was published; therefore, those criteria are used (at least partially, because they also included patients diagnosed before 2013) in the last two studies of Table 1, both published in 2014, and patients diagnosed with "gender dysphoria."

Additional difficulties are related to the classification systems, which have changed over the years. From 2007 onward, in our Gender Identity Unit (GIU), we began using the criteria of the International Classification of Diseases (ICD-10) (World Health Organization, 1992) and those of the DSM-IV-TR (American Psychiatric Association, 2000).

Another additional difficulty is the definition of "case." Many studies include the initial number of cases attended in their gender units, regardless of the therapeutic phase in which they are included (Sociedad Española de Endocrinología y Nutrición, 2003).

The country or city where the study was carried out supposedly should influence the prevalence, as trans-people tend to live in larger cities and particularly in areas or countries defined as ''trans-friendly'' (The European Union Agency for Fundamental Rights, 2014). Nonetheless, we have not been able to find out any evidence that supports this assertion.

The great majority of published studies (Table 1) about prevalence have been carried out in European countries. High-income countries, such as the Netherlands and Sweden, report a high prevalence of transsexualism. Singapore, another high-income country, also reports a very high prevalence (Tsoi, 1988).

There are only some prevalence studies from the Eastern world, which is surprising given that many countries, such as Thailand or India, are known to have an apparently tolerant culture toward trans-identities, although there are many ethnographic-related studies (Nanda, 1985; Reddy, 2005). The large

number of studies investigating the prevalence of transsexual individuals provides the best available insight into the rates of transsexualism, varying from 0.40 (Wålinder, 1971) to 23.6 (Tsoi, 1988) per 100,000 people, and the majority is based on the demand for care of patients in specialized units, though some use different systems.

Therefore, the aim of our study was to assess the demand for care of patients with complaints of gender dysphoria in the only public hospital in the autonomous region of Madrid that provides assistance to these patients. From these data, we will estimate the prevalence, incidence, and sex ratio of the patients diagnosed with transsexualism in our autonomous region of Madrid.

Method

Subjects

The patients included in our study were all referred to the GIU at the Hospital Universitario Ramón y Cajal (Madrid) with complaints of gender dysphoria from the beginning of 2007 up to the end 2015. Referral sources were mainly medical specialists of the hospital and primary care physicians.

Measures

Patients meeting the diagnostic criteria of transsexualism based on the ICD-10 and/or gender identity disorder based on the DSM-IV-TR were selected for epidemiological calculations. The prevalence of demand in the autonomous region of Madrid was calculated as the total number of patients diagnosed with transsexualism in our GIU, divided by the official population over 15 years old registered in 2015 in the autonomous region of Madrid. The annual incidence in demand was calculated as the number of new cases in the past 9 years divided by the population over those 9 years. Population data were obtained from the Spanish Institute of Statistics (Instituto Nacional de Estadística, 2015). We used Student's *t* test to compare ages between two groups, and data on accumulated incidence were estimated with their corresponding 95% confidence intervals.

The sexual orientation was also a routine question in the clinical history of our patients. This approach was performed as a colloquial and open question: "please, tell me about your sexual orientation." Only if the patient did not answer precisely and clearly, a second more direct question was asked: "please, let me know: do you feel more attracted by men, women, both or none?" Their answers were codified accordingly. Comparison between sexual orientation and both groups (MtF and FtM) was contrasted by means of Pearson's Chi-square test. Significance level was established at .05 level.

Results

The official population in the autonomous region of Madrid over 15 years old in 2015 was 5,310,409 (2,516,147 men and 2,794,262 women). During the period 2007–2015, 1171 people were diagnosed with transsexualism (803 MtF and 368 FtM), and all of them were residents of the autonomous region of Madrid. The average age of the MtF group was 28.6 years (SD 9.3; range 16–57 years), which was significantly higher than that of the FtM group (25.3; SD 7.6; range 16–48 years); $t = 5.95$, $df = 1169$, $p = .003$). The greatest demand arose in the 20- to 40-year age range in both groups. Based on these data, the prevalence of transsexualism in this population was 22.1 in 100,000 individuals: 1/3205 (31.2/100,000) MtF and 1/7752 (12.9/100,000) FtM. The sex ratio of prevalence was 2.2:1 for the group of MtF to FtM. The incidence of demand in the GIU of patients diagnosed with transsexualism from 2007 to 2015 (Table 2), based on average population data for the autonomous region of Madrid over 15 years old during those years, was 2.5/100,000 inhabitants/year, which corresponds to an average of 130 transsexuals/year.

Before 2007, transsexual people were attended in the Endocrinology Department of our hospital. When our GIU was created in 2007, the total number of transsexuals included that year was 222 (about 67% over the average of 130/year). The reason for this increased number was that the 2-year accumulated patients were included. The sex ratio of the incidence was 2.2:1 for the group of MtF to FtM, the same as that of prevalence.

Table 3 shows the sexual orientation of our patients. We can see that both groups (MtF and FtM) are predominantly homosexuals (in relation to birth-assigned sex), 84.3 and 90.4%, respectively. The chi-square test for categorical variables showed statistical significance ($\chi^2 = 15.3$; $p = .002$). We can see that 7.4% MtF is heterosexual versus 2.5% in the FtM group.

Discussion

At the end of 2015, the estimated data collected in our GIU provided a prevalence rate of transsexualism in the autonomous region of Madrid of 1/3205 (31.2/100,000) MtF and 1/7752 (12.9/100,000) FtM. These data are roughly up to two to four times higher than the prevalence reported by countries such as the Netherlands (1/11,900 MtF and 1/30,400 FtM) (van Kesteren, Gooren, & Megens, 1996), Germany (1/14,400 MtF and 1/33,200 FtM) (Weitze & Osburg, 1996), or other Spanish autonomous regions, such as Andalusia (1/9685 MtF and 1/15,456 FtM) (Esteva et al., 2006), and up to seven times higher than that of Catalonia, with 1/21,641 MtF and 1/48,096 FtM (Gómez-Gil et al., 2006). However, our data are similar to those published in Singapore (1/2900 MtF and 1/8300 FtM) (Tsoi, 1988) (see Table 1), studies that have all been based on healthcare demand.

Table 2 Incidence and prevalence of transsexualism in the autonomous region of Madrid

Year	New trans-diagnoses	Cumulative trans-diagnoses	Population[a]	Incidence[b]	Prevalence[c]
2007	222	222	5,117,980	4.3 (3.8–5.0)	4.3 (3.8–5.0)
2008	126	348	5,239,144	2.4 (2.0–2.9)	6.6 (6.0–7.4)
2009	176	524	5,312,948	3.3 (2.9–3.8)	9.9 (9.1–10.7)
2010	131	655	5,340,212	2.5 (2.1–2.9)	12.3 (11.4–13.2)
2011	102	757	5,348,532	1.9 (1.6–2.3)	14.2 (13.2–15.2)
2012	102	859	5,365,553	1.9 (1.6–2.4)	16.0 (15.0–17.1)
2013	91	950	5,347,548	1.7 (1.4–2.1)	17.8 (16.7–18.9)
2014	115	1065	5,310,917	2.2 (1.8–2.6)	20.1 (18.9–21.3)
2015	106	1171	5,310,409	2.0 (1.7–2.4)	22.1 (20.8–23.4)

[a] Population of the autonomous region of Madrid >15 years old

[b] Per 100,000 inhabitants/year (95% CI)

[c] Per 100,000 inhabitants (95% CI)

Table 3 Sexual orientation of the patients

	Homosexual	Heterosexual	Bisexual	Asexual	Not recorded[a]	Total
MtF	669 (84.3%)	59 (7.4%)	57 (7.2%)	9 (1.1%)	9[a]	803
FtM	328 (90.4%)	9 (2.5%)	18 (4.9%)	8 (2.2)	5[a]	368

Pearson $\chi^2 = 15.3$, $p = .002$

[a] Excluded for statistical analyses

A recent meta-analysis (Arcelus et al., 2015) collected data from 21 studies of similar methodology and analyzed the prevalence based on a demand for assistance. The final results gave a prevalence of 6.8/100,000 MtF and 2.6/100,000 FtM, i.e., a prevalence considerably lower than in our data.

We believe that studies based on healthcare demand underestimate the "true prevalence" of transsexualism, either because they utilize old data, they involve countries with an unfavorable social climate, or they are based on healthcare systems that offer limited services or involve long delays for treatment.

In Spain, the phenomenon of transsexualism had been marginalized for years, until 1999, when comprehensive treatment in public health in Andalusia was approved; thereafter, these patients began to seek medical care in the public domain of health (Esteva et al., 2006).

We have no single explanation for this high prevalence of transsexualism in our autonomous region of Madrid, even when comparing with other Spanish autonomous regions like Andalusia or Catalonia. We think there might be many causes, and only the association of several of them can explain these figures.

Many transsexual patients do not know about the existence of our GIU. Many of our patients are brought in by previously attended ones. Recently, Aitken et al. (2015) have suggested that there is a general increase in the number of people seeking out mental health services for gender dysphoria (cohort effects). This could help to explain the high incidence in our series, but probably will not explain the differences among other autonomous regions of Spain.

Our data were calculated related to the entire population living at that time in the autonomous region of Madrid. The only requirement was to hold a valid National Insurance Card. Regardless of nationality, race, religion, or how long they had been living in the autonomous region of Madrid, all were included in the study. Furthermore, our GIU is located in the city of Madrid, which is the capital of Spain and where migratory movements have been historically very common. We had noticed that about a quarter of our patients come from South and Central America. Among other reasons, all countries in South America and Central America (except Brazil) speak Spanish, all their capitals have direct flights with Madrid, and their embassies are located in Madrid. The autonomous region of Madrid has also more flats to hire, there are already plenty of trans-people living here, and Madrid's Ministry of Social Affairs has a special team that takes care specifically of trans-people. Madrid also holds the biggest annual LGTB trans-meeting in the first week of July. Therefore, all these factors could explain (at least partially) the greater incidence of transsexualism in our autonomous region of Madrid.

On the other hand, the demand increases depending on the service portfolio offered. It makes sense to suppose that the more services included, the greater the demand, while if the number of services in the portfolio is lower, some of the patients will seek other alternatives, for example, private clinics, thus lowering the

demand and, consequently, the prevalence estimated from the demand. From its creation in 2007, the service portfolio of the GIU of Madrid has included, among other services, surgery for sexual reassignment (both vaginoplasty and phalloplasty), breast surgery (both mammoplasty and mastectomy), and also otorhinolaryngology surgery (type IV thyroplasty to adapt the voice, and thyroid cartilage reduction or chondrolaryngoplasty). The service portfolio of the different gender units in the EU is extremely varied. A great majority of them do not offer the services we provide.

Another possible explanation of the higher prevalence in our GIU may be that the autonomous region of Madrid has no other subprovinces, making it easier to access. The shorter the distance to a service, the easier its access, thus increasing the demand and, therefore, the prevalence.

Last but not least, we suspect that another factor, not usually detailed in most of the published studies, is the waiting list. In our GIU, the time elapsed since the family physician gets the patient into the Madrid's Health Service system until we see this patient in our GIU, is about seven working days (median). We suppose that if the waiting list was 12–18 months, probably a proportion of these patients will not attend their appointment after such a long time, making the prevalence factitiously lower.

The incidence data in our study (2.5/100,000 inhabitants/year, corresponding to an average of 130 people per year) are much higher than those in most countries of the EU (ranging between 0.15 and 0.26/100,000 inhabitants/year) (Esteva et al., 2006; Godlewski, 1988; Hoenig & Kenna, 1974; Landén, Wålinder, Hambert, & Lundström, 1998; O'Gorman, 1981; Olsson & Moller, 2003; Wålinder, 1971). Not even the results reported in Australia (Ross, Wålinder, Lundstrom, & Thuwe, 1981) were higher than ours, and only those of the Singapore study (Tsoi, 1988) came near, with an incidence of 1.58/100,000 inhabitants/year (Table 1). In comparison with another Spanish study, we point out the study conducted in Catalonia (Gómez-Gil et al., 2006), which reached the incidence of 0.73/100,000, much lower than in our data.

The sex ratio of our prevalence was 2.2:1 for MtF/FtM, similar to that of several countries in the EU (Bakker, van Kesteren, Gooren, & Bezemer, 1993; de Cuypere et al., 2007; Eklund, Gooren, & Bezemer, 1988; Gómez-Gil et al., 2006; Judge, O'Donovan, Callaghan, Gaoatswe, & O'Shea, 2014; O'Gorman, 1981; Sørensen & Hertoft, 1980; Wålinder, 1967). Other studies from Sweden (Dhejne, Oberg, Arver, & Landén, 2014; Landén et al., 1998; Olsson & Moller, 2003), Germany (Garrels et al., 2000), and Andalusia, Spain (Esteva et al., 2006), show only a slight predominance between 1.2:1 and 1.6:1 in the group of MtF transsexuals. Nonetheless, no differences were seen between the two groups in Sweden (Wålinder, 1971), Serbia (Vujovic, Popovic, Sbutega-Milosevic, Djordjevic, & Gooren, 2009), Japan (Okabe et al., 2008), and Iran (Ahmadzad-Asl et al., 2011). Some studies in the U.S. (Pauly, 1968), Australia (Ross et al., 1981), and Scotland (Wilson, Sharp, & Carr, 1999) show an important predominance of MtF (four to six times). Finally an inverse ratio, with six times higher and double, respectively, favorable to FtM was found in one European study, from Poland (Godlewski, 1988) and another from Japan (Baba et al., 2011). We cannot find any plausible explanation for the greater variations in the sex ratios in different parts of the world.

After a thorough search of the literature for the available evidence, we believe that the results of the present study are novel. This study was conducted in a low-income country, but with great social acceptance of this population and more concretely in Madrid, which is quite friendly toward transsexual patients. Furthermore, our GIU is easily accessible, has a broad portfolio, and has no waiting list. In this way, our data reflect a very high demand, including one of the more important numbers of transsexual patients attended, with our data reporting among the highest published prevalence and incidence.

Acknowledgements The authors are indebted to Ana Royuela (Clinical Biostatistics Unit, Puerta de Hierro University Hospital, Instituto de Investigación Puerta de Hierro (IDIPHIM), Madrid, Spain), for her help in the statistical analysis.

Compliance with Ethical Standards

Conflict of interest None.

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