Archives of Sexual Behavior (2018) 47:1301–1304
https://doi.org/10.1007/s10508-018-1204-9

LETTER TO THE EDITOR

Sex Ratio in Children and Adolescents Referred to the Gender Identity Development Service in the UK (2009–2016)

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Received: 12 February 2018 / Accepted: 21 March 2018 / Published online: 25 April 2018

Introduction

Over the last decade, several child and adolescent gender identity services have reported an increase in young people who seek help with incongruence between the experienced gender identity and the gender to which they were assigned at birth (Aitken et al., 2015; Wood et al., 2013). Many of those, but not all, would meet the diagnostic criteria for gender dysphoria (GD) (APA, 2013). It has been suggested that this increase is mostly due to an influx of birth-assigned females coming forward. Aitken et al. (2015) reported a significant temporal shift in the sex ratio of clinic-referred gender-diverse youth to Toronto and Amsterdam, from a ratio favoring males prior to 2006, to a ratio favoring assigned females from 2006 to 2013.

The national Gender Identity Development Service (GIDS) in the UK is the largest child and adolescent specialist gender service in the world, seeing young people up to the age of 18. Historically, more birth-assigned males were presenting to GIDS in childhood and adolescence (Di Ceglie, Freedman, McPherson, & Richardson, 2002). However, in a more recent study, adolescent referrals to GIDS favored birth-assigned females (de Graaf et al., 2017; Holt, Skagerberg, & Dunsford, 2016).

Gender-diverse young people often present with psychological difficulties. Compared to children, a greater percentage of gender-diverse adolescents have psychological difficulties in the clinical range (Steensma et al., 2014). The level of psychological well-being for birth-assigned males and females referred in childhood are often comparable (Steensma et al., 2014). In adolescents, however, gender differences in psychological functioning are noted more frequently. The literature suggests that birth-assigned males tend to show more internalizing difficulties in the clinical range than birth-assigned females (de Vries, Steensma, Cohen-Kettenis, VanderLaan, & Zucker, 2016). However, more recently, increased psychopathology was also reported for gender-diverse birth-assigned females (de Graaf et al., 2017; Kaltiala-Heino, Sumia, Työläjärvi, & Lindberg, 2015).

The current study aimed to examine the sex ratio in the number of children and adolescents referred to GIDS over the past 7 years and to investigate whether any gender differences can be found in terms of psychological functioning and age at referral.

Method

For this retrospective review of GIDS referrals, exemption for ethics was confirmed by external and local ethics committees affiliated with the Tavistock and Portman NHS Research and Development Department. Between January 1, 2009, and December 31, 2016, a total of 4506 young people, aged between 1 and 18 years, were referred to GIDS. Age at referral and birth-assigned gender were collected at time of referral. The sex ratio for children and adolescents was tested for significance using the binomial test. Age at referral was analyzed per year using independent *t* tests. The Child Behavior Checklist (CBCL), which was completed by the parent during the assessment phase, was used to measure internalizing and externalizing clinical range scores (*T* scores > 63) (Achenbach & Edelbrock, 1983). The CBCL data were analyzed by birth-assigned gender in children and adolescents using a chi-square test with a two-tailed *p* value. CBCL data were available for 39% of all child cases. In the adolescent sample, 60% had a completed CBCL. One explanation for the high number of missing CBCL data could have to do with service users not

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always returning questionnaires when receiving these after their first appointment. The higher percentage of missing data in the child group could relate to the fact that a greater proportion of younger children may not be seen as frequently as adolescents, and possibly dropout during the assessment phase.

Results

Characteristics of GIDS referrals, of which the vast majority (84%) were adolescents, are shown in Table 1. A significant difference by the binomial test, $p < .001$, showed that the sex ratio in children favored birth-assigned males (M/F, 1.31:1), whereas in adolescents referrals favored birth-assigned females (M/F, 1:2.12), binomial test, $p < .001$. Interestingly, in both children and adolescents, the average increase rate of referrals was higher for birth-assigned females, as displayed in Fig. 1.

For age at referral in children, birth-assigned males were, on average, referred at a younger age, $t(717) = 4.05$, $p < .001$, whereas in adolescents birth-assigned females were younger, $t(3785) = -2.91$, $p < .005$. No significant differences were found over time, which indicates that the age at referral for birth-assigned males and birth-assigned females in children and adolescents has remained stable over the last 7 years.

With regard to psychological functioning, a significantly greater percentage of adolescents had Internalizing problems in the clinical range compared to children, $\chi^2(1, N = 1696) = 12.02$, $p < .001$. For this comparison, however, there is a sex difference: the difference between children and adolescents is significant only for birth-assigned females, $\chi^2(1, N = 1127) = 11.17$, $p < .001$, and not for birth-assigned males, $\chi^2(1, N = 569) = .37$, $p = .54$. On the other hand, Externalizing problems were significantly more prevalent in children than in adolescents, $\chi^2(1, N = 1696) = 39.92$, $p < .001$. For adolescents, a greater percentage of birth-assigned females showed Internalizing problems in the clinical range compared to birth-assigned males, $\chi^2(1, N = 1468) = 16.47$, $p < .001$, whereas a significantly greater percentage of birth-assigned males scored in the Externalizing clinical range compared to birth-assigned females, $\chi^2(1, N = 1468) = 4.36$, $p < .05$. For children, no significant gender differences were found on both Internalizing, $\chi^2(1, N = 228) = .01$, $p = .91$, and Externalizing scales, $\chi^2(1, N = 228) = .00$, $p = 1.0$.

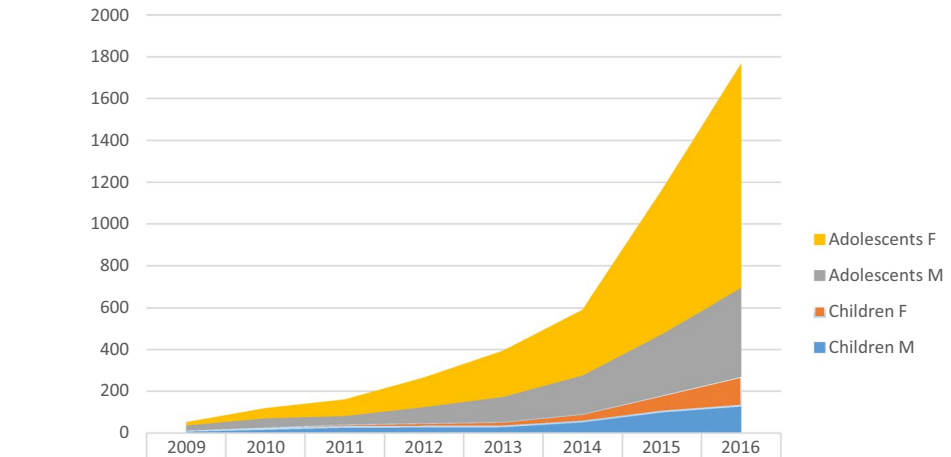
Discussion

The UK has witnessed an unprecedented increase in referrals of gender-diverse young people seeking professional help. Both in children and adolescents the rise in referrals was steeper for birth-assigned females compared to birth-assigned males. This has resulted in an inversion in sex ratio in adolescent referrals and an evening out of birth-assigned male and female referrals in childhood. While the overall number of birth-assigned female referrals has increased, the age at which referrals were made did not change over time.

Table 1 Characteristics of GIDS referrals and CBCL scores

	Children (< 12 years)		Adolescents (12–18 years)	
	(*N* = 719)		(*N* = 3787)	
	Assigned males	Assigned females	Assigned males	Assigned females
2009–2016				
Total *N*	408	311	1210	2577
Sex ratio	56.7%	43.3%	32.0%	68.0%
Increase in referrals year on year				
2009 *N*	10	2	24	15
2010% (*N*)	90% (19)	250% (7)	83% (44)	220% (48)
2011% (*N*)	53% (29)	71% (12)	0% (41)	63% (78)
2012% (*N*)	3% (30)	42% (17)	88% (77)	81% (141)
2013% (*N*)	3% (31)	29% (22)	56% (120)	57% (221)
2014% (*N*)	77% (55)	64% (36)	54% (185)	42% (314)
2015% (*N*)	87% (103)	114% (77)	58% (293)	102% (689)
2016% (*N*)	27% (131)	79% (138)	45% (426)	55% (1071)
Average % increase	48.6%	92.7%	54.9%	88.6%
Mean age at referral (*M*, SD)	8.27 (2.27)	8.97 (2.34)	15.59 (1.40)	15.45 (1.32)
CBCL clinical range (*N*)	119	109	450	1018
Internalizing problems % (*N*)	52.1% (62)	50.5% (55)	55.8% (251)	67.0% (682)
Externalizing problems % (*N*)	35.3% (42)	34.9% (38)	20.2% (91)	15.6% (159)

CBCL Child Behavior Checklist



	2009	2010	2011	2012	2013	2014	2015	2016
Adolescents F	15	48 *	78 *	141 *	221 *	314 *	689 *	1071 *
Adolescents M	24	44 *	41	77 *	120 *	185 *	293 *	426 *
Children F	2	7	12	17	22	36	77 *	138 *
Children M	10	19	29	30	31	55 *	103 *	131

AFAB = assigned female at birth; AMAB = assigned male at birth
* Indicates $p < .05$ which shows a significant increase of referrals compared to the previous year

Fig. 1 Number of GIDS referrals per year for child (<12 years) and adolescent (12–18 years) birth-assigned females and birth-assigned males. *AFAB* assigned female at birth, *AMAB* assigned male at birth. *Indicates $p < .05$ which shows a significant increase in referrals compared to the previous year

Compared to international data reported by other gender identity clinics, the sex ratio of the child referrals in the UK was more in line with the child sex ratio reported by the Amsterdam clinic (1.25:1, $N = 860$) than with the Toronto clinic, which reported a larger proportion of birth-assigned males referred in childhood (4.33:1, $N = 624$) (Steensma, Cohen-Kettenis, & Zucker, 2018). While across all three clinics birth-assigned boys were significantly younger than the referred girls in childhood, the mean age of the children referred in Toronto was significantly younger at referral compared to Amsterdam and the UK. As suggested by de Vries et al. (2016), these outcomes could reflect that there are cultural differences between North America and Europe, specifically with regard to tolerance or acceptance of gender-diverse behavior, particularly in birth-assigned boys.

For adolescents, our findings reflect the general trend of an inversion in sex ratios reported both in Amsterdam and Toronto (in Amsterdam: 1:1.72, $N = 234$; in Toronto: 1:1.76, $N = 202$; Aitken et al., 2015), in the U.S. (1:1.4, $N = 180$; Reisner et al., 2015), and more pronounced in Germany (1:2.9, $N = 39$; Becker, Ravens-Sieberer, Ottová-Jordan, & Schulte-Markwort, 2017) and Finland (1:6.8, $N = 49$; Kaltiala-Heino et al., 2015).

There are various explanations put forward in the literature contemplating the increase in birth-assigned females. Some have suggested that differences in normative sex development, in which birth-assigned females experience pubertal changes at an earlier age than birth-assigned males, might have an impact on the greater number of adolescent birth-assigned females coming forward (Aitken et al., 2015). However, as the increase in birth-assigned female referrals was found across the age range, arguments around timing of puberty cannot fully explain the rising number of birth-assigned females. Several clinical observations suggest that pre-pubertal young people, specifically girls, may experience adversity toward puberty (Harris, 2004; Lesko, 2012; Pinto, 2007). Therefore, rather than the experience of puberty, could we argue that birth-assigned females in childhood are increasingly more worried about the thought of puberty?

Other arguments regarding the influx in birth-assigned females suggest that, given the increased awareness and visibility of declaring trans identities, "coming out" in this context may be easier for birth-assigned females than it is for birth-assigned males (Aitken et al., 2015). This argument can be supported by the claim that gender-variant behavior in birth-assigned males may be more exposing and can lead to social stigma (Shiffman et al., 2016).

Additionally, the digitalization of the ways in which young people and society communicate should not be underestimated. Social media is increasingly used as a platform to seek peer group belonging and support, especially by adolescent girls (Barker, 2009). In the current context, with increasingly more birth-assigned females referred to gender services presenting with psychopathology, could we argue that influences of socially constructed views of "femininity" and "masculinity" and the way these are being displayed on social media may have an impact on the increase of birth-assigned female referrals, especially for those who do not feel they fit this stereotype?

Psychopathology in adolescent birth-assigned females is a topical issue which is currently reported by various international gender identity clinics (de Graaf et al., 2017; Kaltiala-Heino et al., 2015). Not only adolescent girls, also a greater percentage of referred birth-assigned males presented with externalizing problems in the clinical range in adolescence, which could reflect the current changing climate. Whereas adolescents tend to report more behavioral and emotional problems than children, in our sample, a greater percentage of children had externalizing problems in the clinical range compared to the adolescents. When comparing these findings to previously published outcomes from the Toronto clinic and the Amsterdam clinic (Steensma et al., 2014), a greater percentage of children in the UK had internalizing and externalizing problems in the clinical range. The increase in psychopathology mirrors a general trend of young people in the UK, especially in adolescent girls (Lessof et al., 2016). A new phenomenon, however, is the increase in referred birth-assigned females in late childhood, which is also reported by other gender identity clinics (Steensma et al., 2018). With the influx of birth-assigned females starting in childhood, we might expect to see an increase in behavioral problems in children, especially those aged 10–12 years.

The steep increase in birth-assigned females seeking help from gender services across the age range highlights an emerging phenomenon. It is important to follow birth-assigned females' trajectories, to better understand the changing clinical presentations in gender-diverse children and adolescents and to monitor the influence of social and cultural factors that impact on their psychological well-being.

Compliance with Ethical Standards

Conflict of interest The authors declare there is no conflict of interest. There was no sponsor involved in this Letter. The authors disclose that there are no prior publications or submissions with any overlapping information of this kind.

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