

Background

Attention deficit hyperactivity disorder (ADHD) is frequently present in young people with Tourette syndrome (TS)¹, and because of this it has been suggested that a personal or family history of ADHD may help differentiate TS from functional tic-like behaviours (FTLB)². However, studies of young people with FTLB have wide estimates of ADHD comorbidity, ranging 23%-50%^{3,4}, and little is known about the demographics and clinical details of this specific cohort. This study aimed to explore this cohort in detail, comparing ADHD in those with TS and/or FTLB.

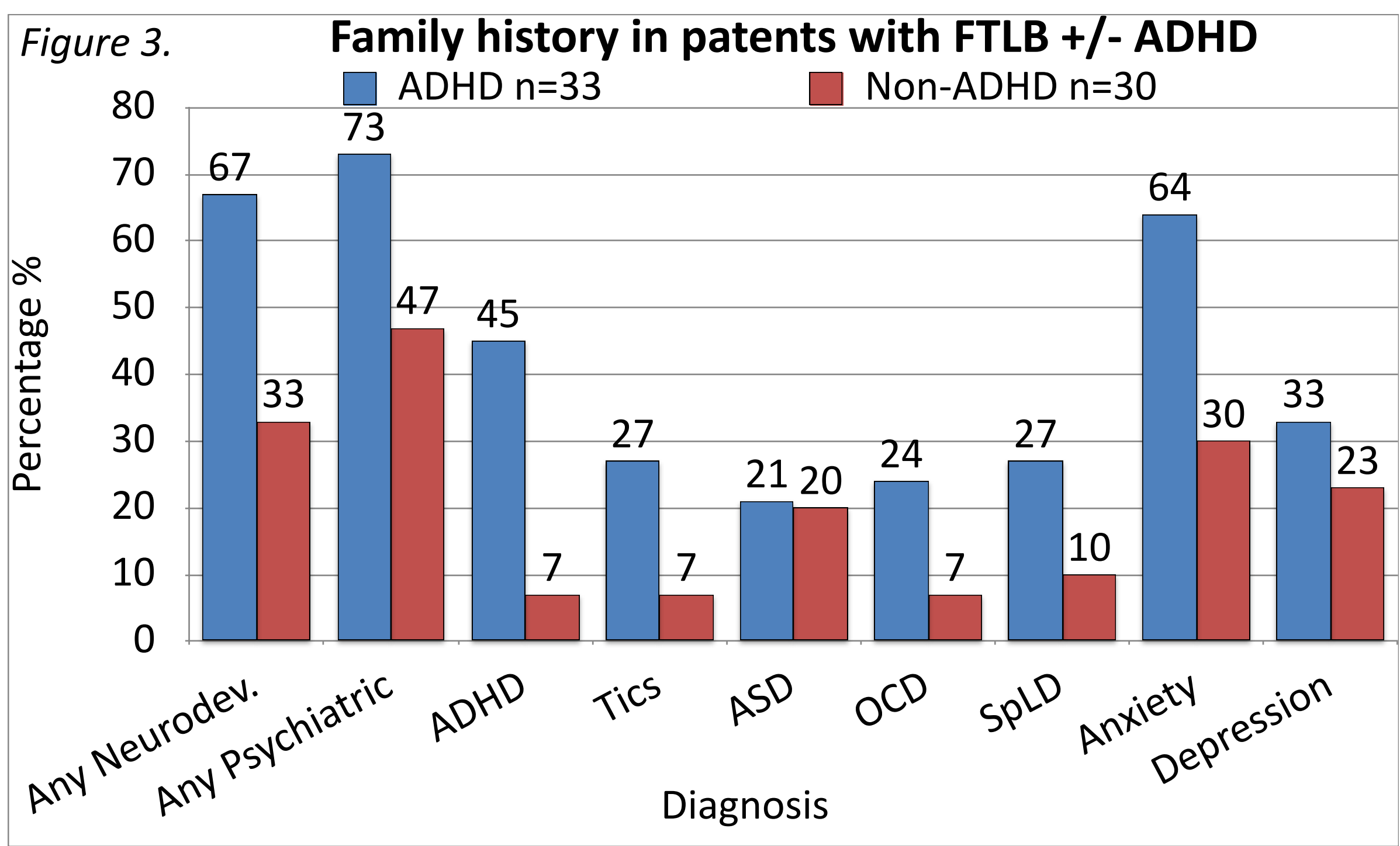
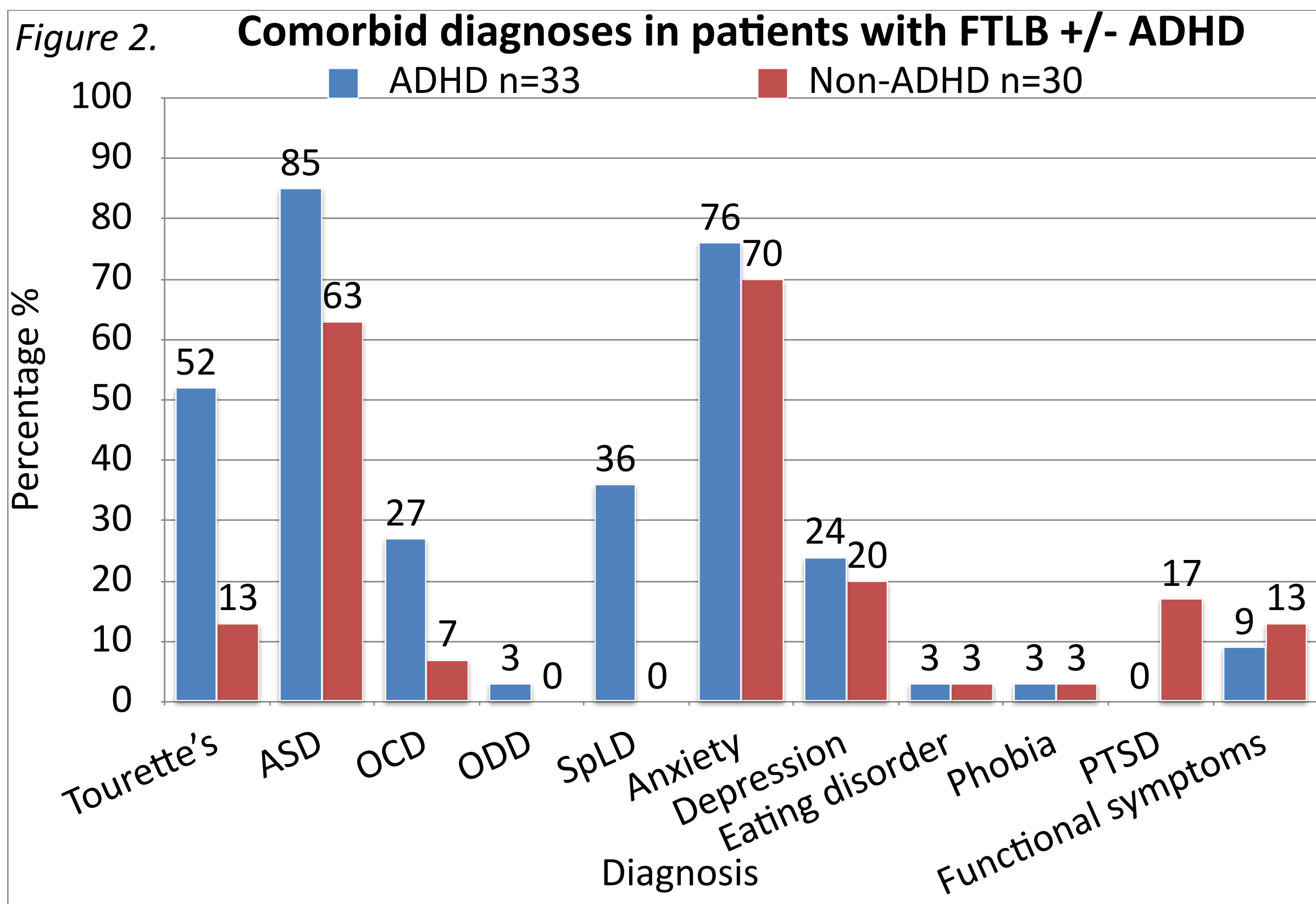
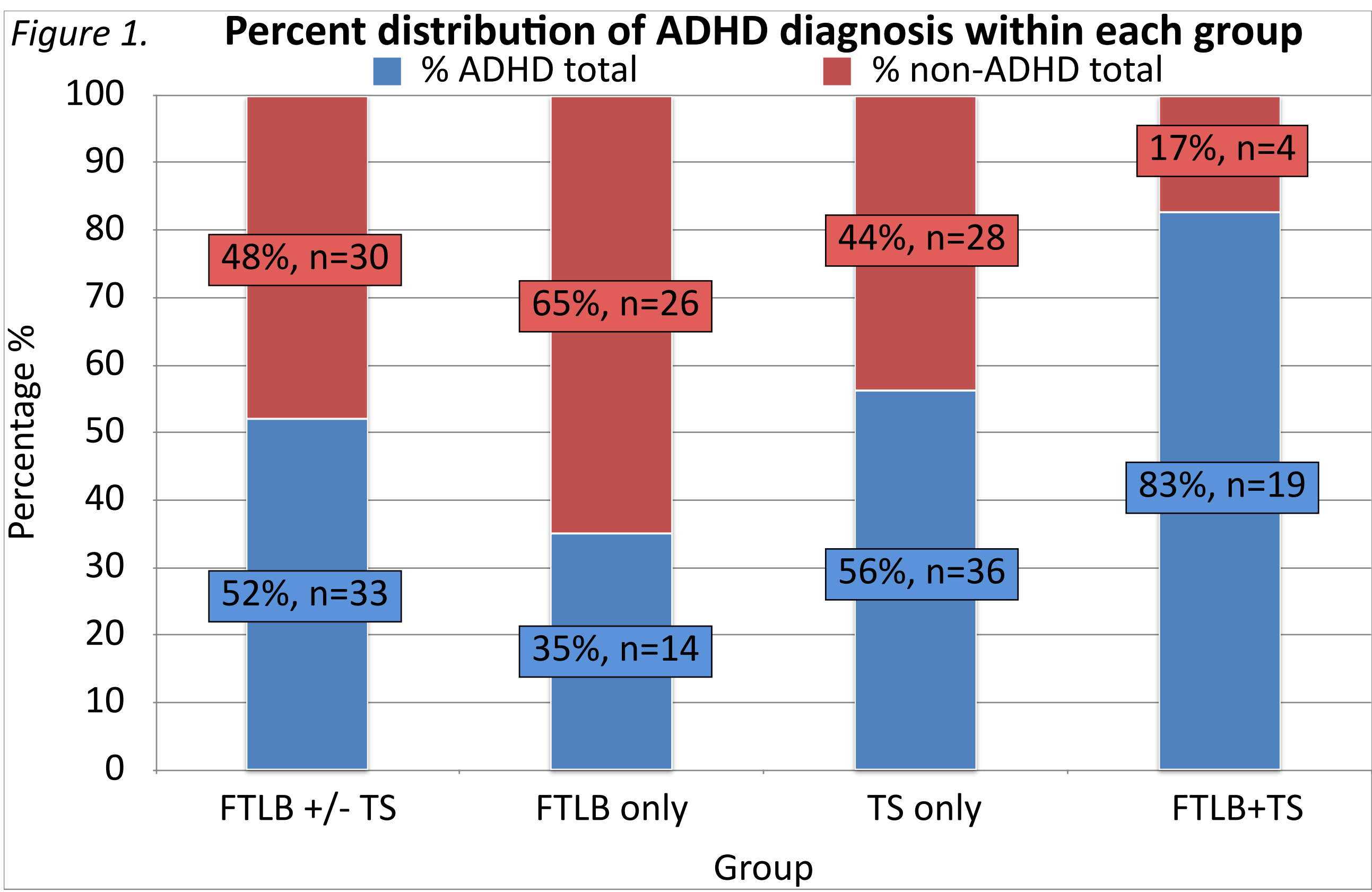
Methods

Young people (N=127) aged 4-17 years referred to the Tic Disorder Service between July 2019 and May 2022 who were diagnosed with FTLB and/or TS were identified retrospectively from clinical care notes. All cases underwent clinical assessment and undertook DAWBA and SDQ questionnaires as part of routine clinical practice. Information was also collected from electronic health records, including: demographics, co-morbid psychiatric and neurodevelopmental conditions, and family history of neurodevelopmental and psychiatric conditions. Within the FTLB cohort those with ADHD were compared to those without and within the ADHD cohort the FTLB and TS groups were compared.

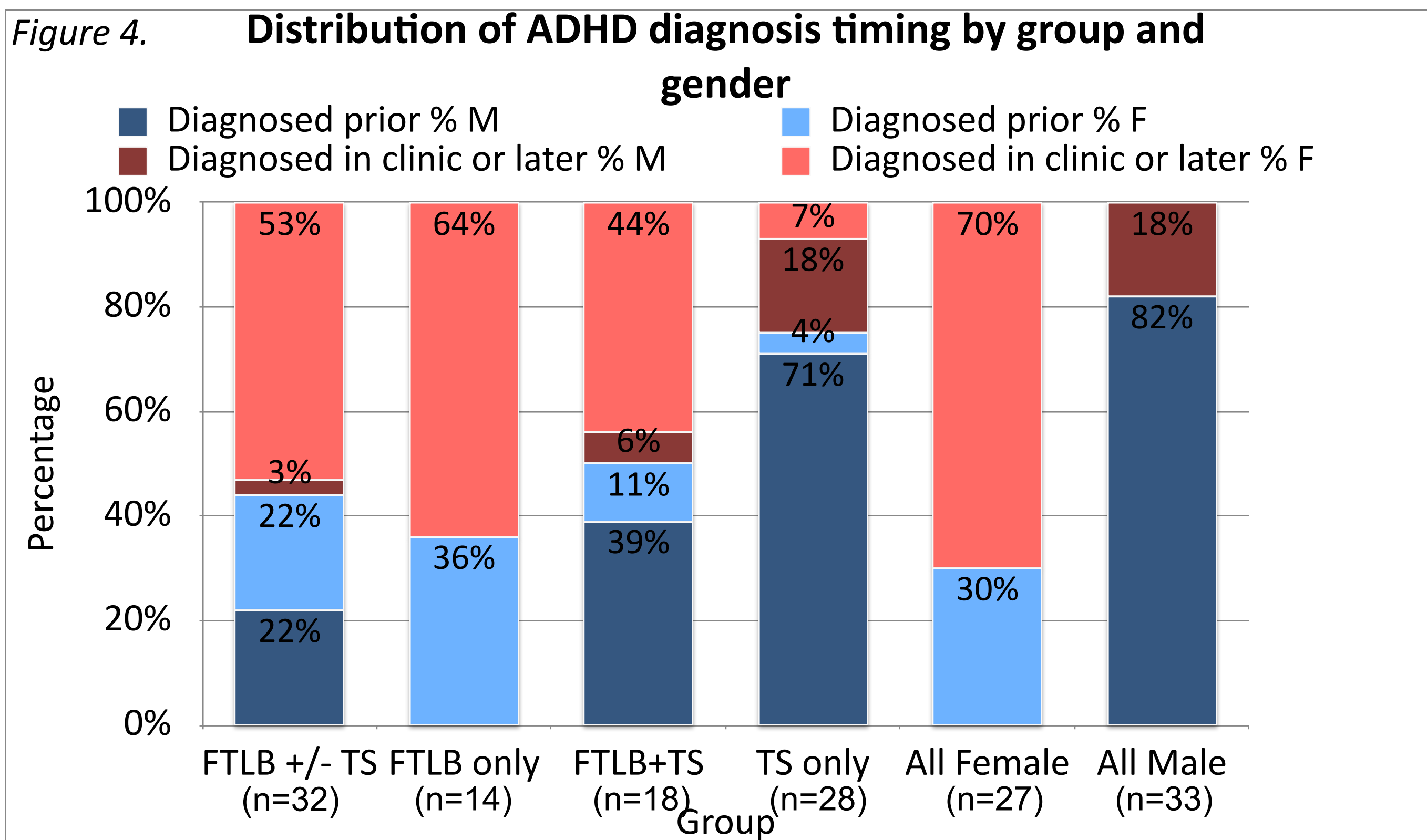
Results

54% of all cases with FTLB and/or TS had ADHD. 52% of patients with FTLB had ADHD, compared to 63% of patients with TS. When the cohort is split into three groups: FTLB only, TS only and FTLB+TS the proportions by ADHD are shown in *Figure 1*.

Young people with ADHD and ‘tics’ were more likely to have both TS and FTLB (28% vs 7%). Young people with ADHD and ‘tics’ were also more likely to have additional neurodevelopmental conditions (91% vs 70%). *Figure 2*. Demographics were similar between the ADHD and non-ADHD FTLB groups, apart from a bimodal age of tic onset in the former (peaks at ages 6 and 13 vs 13), and fewer female (76% vs 93%). This is consistent with the increased likelihood of combined TS-FTLB in young people with ADHD, as the bimodal tic onset reflects early tic onset of TS and later FTLB exacerbation. This group has higher DAWBA and SDQ scores and higher rates of family history for both neurodevelopmental and psychiatric conditions indexing multiple co-morbidity and genetic vulnerability. *Figure 3*.



Only 42% of patients with ADHD and FTLB were diagnosed prior to clinical assessment for tics, and only 36% of those diagnosed were receiving active treatment for ADHD, compared to 52% treated in children with TS and ADHD. Nearly all FTLB patients diagnosed with ADHD in clinic or on follow-up were female compared to an equal percentage diagnosed prior (94% vs 50%). *Figure 4*.



Conclusions

This study is the only study to examine young people with FTLB and ADHD. ADHD is found to be highly prevalent in both TS and FTLB, and young people with both TS and FTLB. This latter group are likely to reflect young people with mixed neurodevelopmental disorder who are likely to be particularly vulnerable to FTLB. Young females, with ADHD in FTLB were less likely to have been diagnosed and/ or treated for ADHD. As anxiety is a known consequence of ADHD in females⁵, it is possible that anxiety generated from undiagnosed/untreated ADHD is a contributory factor to FTLB. Better identification, diagnosis, and treatment of ADHD in females may prevent FTLB.