A review of hypogonadism in a HIV positive cohort

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Background

The link between HIV infection and hypogonadism was well recognised in advanced disease before the introduction of combination antiretroviral therapy (cART). However, hypogonadism remains an issue in HIV positive patients despite effective treatment .The aetiology of hypogonadism within the context of HIV remains undetermined.

Aims

We aim to study the HIV positive population within Brighton who have been diagnosed with hypogonadism within the last 5 years in an attempt to gain an understanding of the types of symptoms these men are facing, as well as some of the factors that may be contributing to their diagnosis of hypogonadism.

Methods

- A data search was carried out within a single centre HIV clinic, The Lawson Unit, to identify patients with abnormal free testosterone levels (<160pmol/L) within the last 5 years.
- Data was collected on parameters associated with diagnosis of hypogonadism such as LH/FSH and SHBG, CD4 count, CD4 baseline, duration of HIV infection, antiretrovirals at the time of hypogonadism diagnosis, nadir CD4 and viral load.

Demographic characteristics of patients

- The majority of patients were white, from the UK and identified as homosexual
- The average age of these patients was 58 (31-88) with 80% of patients were over the age of 50

Table I. Demographics (N=69)

	Number	Percentage%
Age (years)		
<35	1	2
35-50	13	19
51-65	40	58
66-75	12	17
>75	3	4
Sexuality		
Homosexual	64	93
Heterosexual	5	7
Born in UK		
Yes	61	88
No	8	12
Ethnicity		
White	66	95
Black	2	3
Mixed	1	2

Results

Biochemical measurements

- On average patients had been living with HIV for 14 years (1-32) with 94% having had HIV for over 5 years
- The average CD4 nadir of these patients was 366.91 with 36% of patients having a CD4 nadir count of under 300.
- There was a large range in SHBG, however, the average level of 81.7(13-200) was above that of the normal range
- 71% had normal total testosterone levels.

Table 2. Biochemical measurements and Diagnosis

	Mean (range)	Normal range
Years living with HIV	14.5 (1-32)	-
CD4 nadir (cells/mm^3)	366.91/ 356 (15-1037)	-
CD4 count (cells/mm^3)	375.91 (15-1113)	>400
Viral load baseline	161,807 (<40-1,000,000)	-
Free testosterone (pmol/L)	116.2 (3-199)	163 - 473 pmol/L
Total testosterone (nmol/L)	11 (0.2-27.3)	6.68-25.7 nmol/L
Sex hormone binding globulin (nmol/L)	81.7 (13-200)	19.3-76.4 nmol/L
LH (IU/L)	10.14 (0.4-37)	1.7 - 8.6 IU/L
FSH (IU/L)	13.6 (0.7-55.1)	1.5 - 12.4 IU/L

Symptoms

- 54 patients (78%) presented with symptoms. Of these symptoms the most commonly reported were fatigue, low libido and erectile dysfunction with only one patient suffering with bilateral gynecomastia
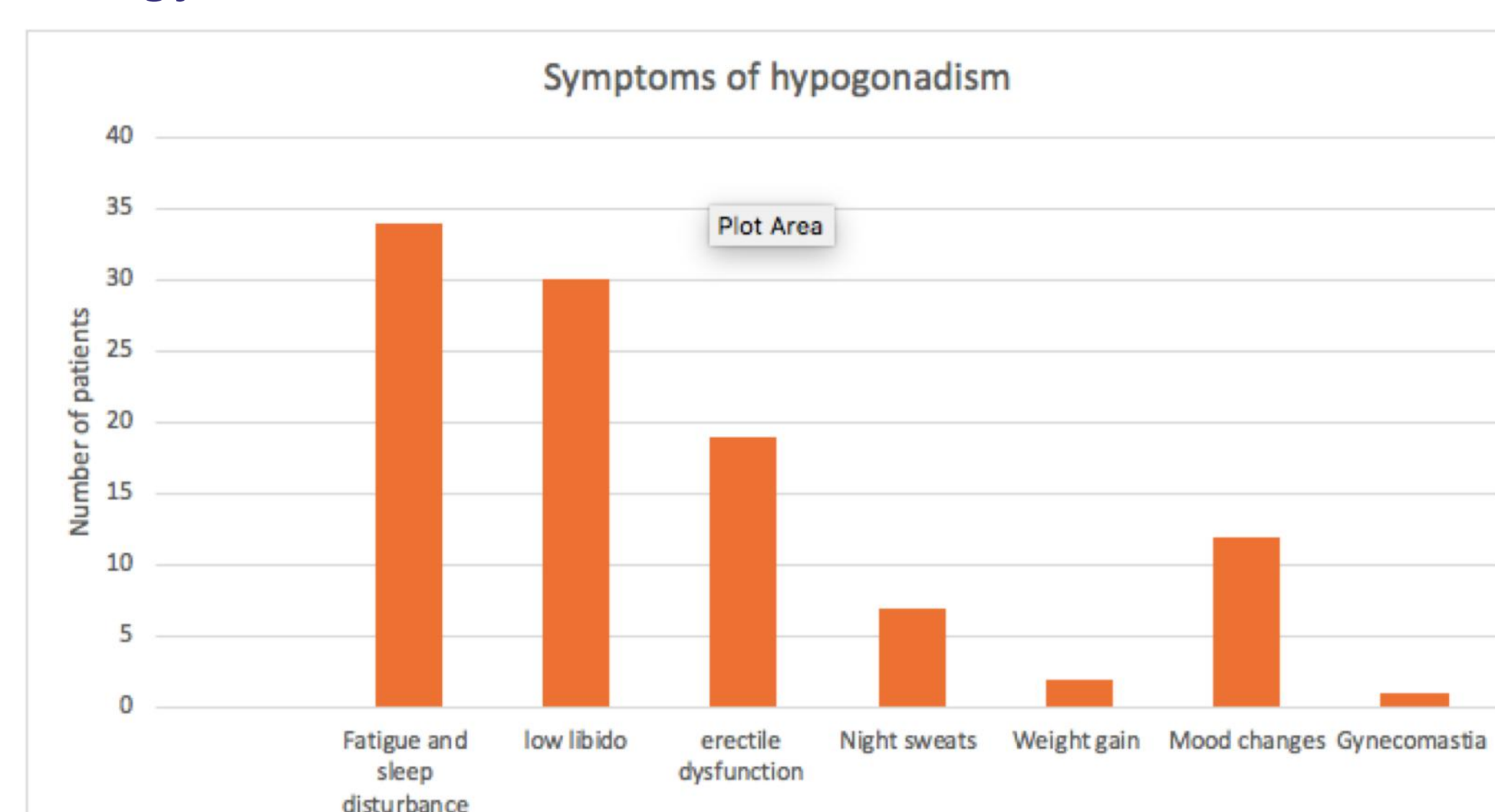

Figure 2. bar chart showing number of patients experiencing common symptoms of hypogonadism

Risk factors

- On average patients were overweight with a BMI of 26.5 (17.15-39). 35% had a healthy BMI, 56% of patients were classified as either overweight or obese and 4% were underweight. The majority of patients had a co-morbidity with 36% having three or more. The commonest co-morbidities within this cohort included osteoporosis, peripheral neuropathy and cardiovascular disease.

Table 3. Frequency of co-morbidities

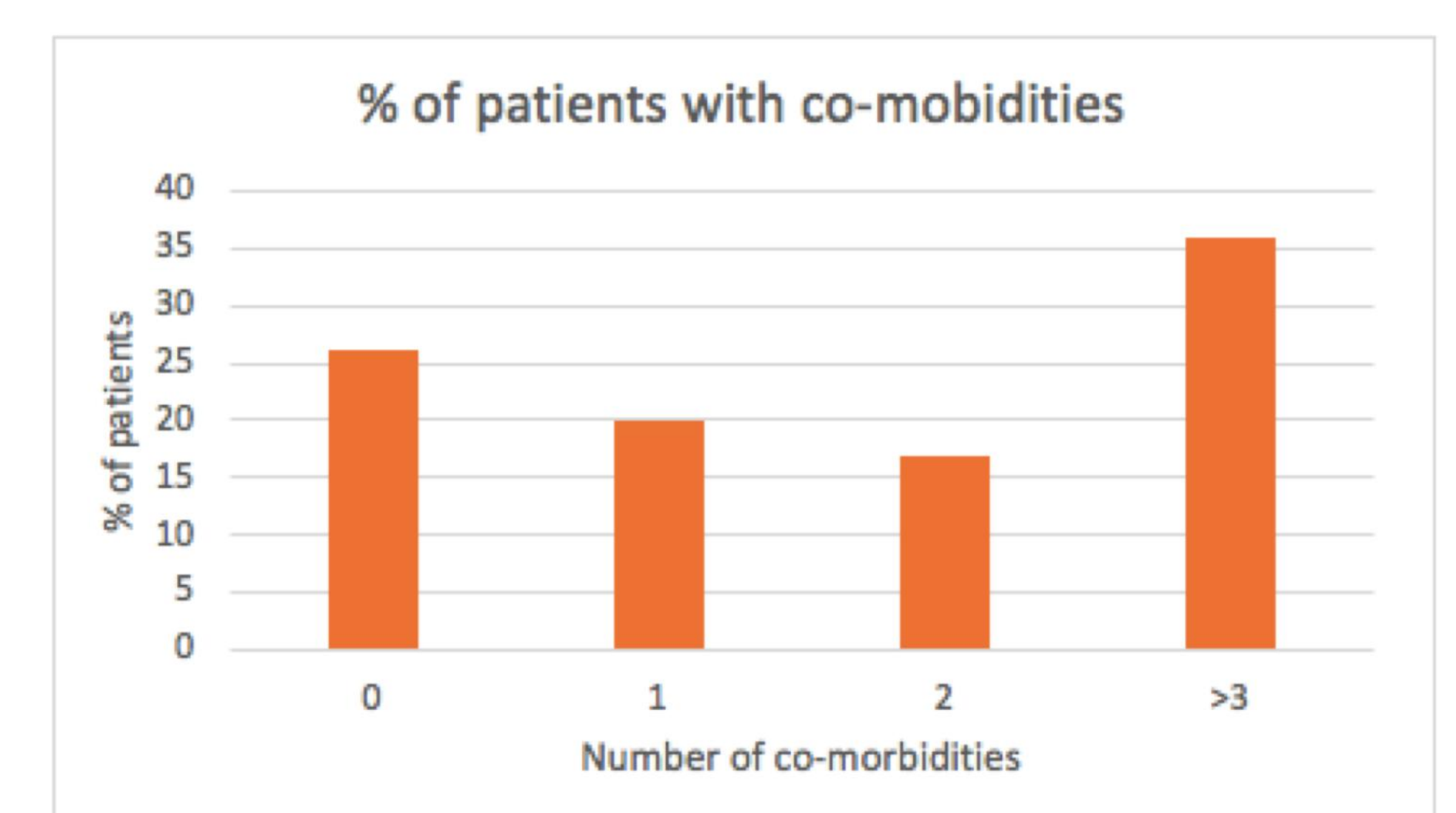| Co-morbidities	N
Peripheral neuropathy	12
Osteoporosis	22
Cardiovascular disease	23
Dyslipidaemia	15
Cirrhosis	6
Inflammatory bowel disease	4
Previous or current Hepatitis C	9

Figure 3 showing the percentage of patients with 0,1,2 or over 3 comorbidities

Management

52% of identified patients went on to have testosterone replacement therapy. The majority of the remaining patients did not start therapy either due to ongoing investigations or personal choice. Therapy was contraindicated in one patient due to benign prostatic hyperplasia. Of those on testosterone, 47% experienced an improvement in their symptoms. 11% experienced adverse side effects or reported that symptoms worsened. Out of those on testosterone therapy 67% had a regular PSA measurement done.

Conclusions

- To conclude, this study found that the majority of the patients diagnosed with hypogonadism were older and most were over the age of 50. In addition, most patients had been living with a diagnosis of HIV for over 10 years. This study found that 43% of patients had a high SHBG level. This is significant because had they only had their total testosterone levels measured, a diagnosis of hypogonadism may have been missed as 71% had a TT level within the normal range The cause effect relationships between HIV-infection, age and co-morbidities with hypogonadism are difficult to determine.