

**PD28-03****CAN WEARABLE DEVICES BE USED TO EVALUATE AND MONITOR SEXUAL ENCOUNTER PHYSIOLOGY IN MEN WITH PSYCHOGENIC ERECTILE DYSFUNCTION?**

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**INTRODUCTION AND OBJECTIVE:** The physiological changes that occur during sexual arousal and function in males with psychogenic erectile dysfunction remains poorly understood, even though erection physiology is well-established. To address this knowledge gap, we undertook a prospective study that utilized a combination of qualitative and quantitative approaches to examine the effectiveness of wearable devices in tracking and discerning these physiological changes in individuals diagnosed with psychogenic sexual dysfunction. This study aimed to leverage wearable device technology to precisely measure and analyze physiological parameters, including heart rate, during sexual encounters both alone and with a partner in individuals diagnosed with psychogenic erectile dysfunction.

**METHODS:** Individuals diagnosed with psychogenic erectile dysfunction (normal erections during masturbation whereas suffered from erectile dysfunction with a partner) were asked to wear a FitBit Versa 3 for a period of twelve weeks. Encrypted, de-identified data from the Fitbit was sent via the Fitbit app on subject's smartphones to a single member of the research team. Subjects were asked to log the number, type of sexual activity, and timing of sexual encounters for analysis.

**RESULTS:** A total of thirty-five sexual encounters were recorded over a period of twelve weeks, which demonstrated the feasibility of using wearable devices to assess heart rate variability during sexual activity. No discernable difference was noted in heart rate variability between masturbation and sexual activity with partners, which both mimic the classical four-phase model of human sexual response, with an excitement phase (initial rise in heart rate), plateau phase, orgasm (peak heart rate), and resolution phase (decrease back to baseline heart rate).

**CONCLUSIONS:** Our study underscores the practicality of utilizing wearable device technology to conveniently and accurately measure physiological parameters during sexual activity. Additionally, our findings represent the first instance of heart rate variability showing consistency between masturbation and sexual activity with a partner in patients diagnosed with psychogenic erectile dysfunction, aligning with the original four-phase model of human sexual response. These discoveries contribute to the limited body of literature focusing on objective physiological measurements during sexual activity and emphasize the potential of wearable technology in monitoring physiological changes during intimate encounters.

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**PD28-04****SEVERITY OF PENILE CURVATURE IN PATIENTS WITH PEYRONIE'S DISEASE AND ERECTILE DYSFUNCTION DOES NOT CORRELATE WITH DYNAMIC COLOUR DOPPLER DUPLEX ULTRASOUND PARAMETERS: FINDINGS FROM A REAL-LIFE CROSS-SECTIONAL STUDY**

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**INTRODUCTION AND OBJECTIVE:** Men presenting with Peyronie's disease (PD) frequently have concomitant or develop

erectile dysfunction (ED) over time. Data are lacking concerning how the severity of penile curvature may impact toward haemodynamic parameters at penile dynamic colour Doppler duplex ultrasound (CDDU).

**METHODS:** Complete data from 111 consecutive patients seeking first medical help for PD and concomitant ED were analysed. Comorbidities were scored with Charlson Comorbidity Index (CCI). All patients completed the International Index of Erectile Function (IIEF) at baseline, and ED severity was categorized according to Cappelleri's criteria. CDDU was homogeneously performed after intracavernosal injection of alprostadil 20 ug and sexual stimulation in all patients. Vasculogenic ED was defined as a peak systolic velocity (PSV) <35 cm/s and a resistance index (RI) <0.8. Patients with pathologic RI were excluded. Curvature was homogeneously measured with a goniometer at maximum rigidity at the time of CDDU in all cases. Descriptive statistics was used to compare patients with normal vs. pathological CDDU parameters. Linear regression models explored factors associated with pathological PSV at CDDU.

**RESULTS:** Overall, median (IQR) age was 56 (47-62) years. Median PSV and penile curvature were 49.1 (38.4-59.8) cm/s and 40 (30-65) degrees, respectively. Of all, 47 (42.3%), 36 (32.4%) and 28 (25.3%) men depicted penile curvatures in a range of 10-30, 30-70 and 70-90 degrees at CDDU, respectively. Of all, 90 (81.1%) men exhibited a PSV >35 cm/s. Severe ED (i.e., IIEF-EF <11) was found in 4 (3.6%) patients. Notably, patient with normal CDDU parameters did not differ in terms of median (IQR) severity of the penile curvature 40° (30°- 68.5°) vs. 32.5° (27.5°-51°) ( $p=0.38$ ) in respect to those with normal CDDU parameters. The two groups did not differ in terms of differences were detected between in terms of age, BMI, CCI, smoking, alcohol consumption, circulating testosterone levels, and IIEF-EF scores. At linear regression analysis, the degree of penile curvature was not associated with PSV at CDDU (Coeff: 0.08,  $p=0.2$ ). No other variables were found associated with PSV at CDDU.

**CONCLUSIONS:** Our study indicates the lack of a significant correlation between the severity of penile curvature and CDDU parameters in men seeking first medical help for PD and concomitant self-reported ED, with most patients showing normal haemodynamic values despite reporting concomitant ED. These findings emerge to be relevant in terms of management work-up of PD patients in the real-life setting.

**Source of Funding:** None

**PD28-05****AGE SPECIFIC CALCULATED FREE TESTOSTERONE RANGES IN ADULT MEN**

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**INTRODUCTION AND OBJECTIVE:** Measurement of free testosterone (FT) levels can be an important step in the evaluation of men with suspected testosterone deficiency. While it is well known that FT levels decline with age, its clinical utility is limited due to the lack of data on age specific reference ranges. This study aimed to provide age specific reference ranges for FT to assist in the evaluation of men with suspected testosterone deficiency.

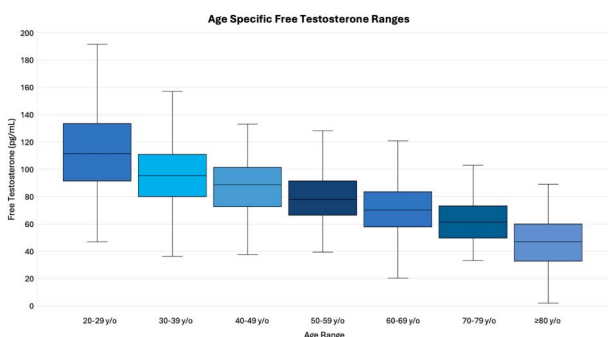
**METHODS:** The 2013-2016 National Health and Nutrition Examination Survey was used to collect data on a nationally representative sample of men in the United States. Men were included in the analysis if they were  $\geq 20$  years old and had total testosterone labs available that were drawn in the morning (between 6 and 10 a.m.). Men were excluded from the study if they had a BMI >30, serum creatinine >1.5, AST or ALT >1.5 times the upper limit of normal, history of diabetes mellitus, testicular cancer, thyroid disease, or were on hormonal medications. FT levels were calculated using total testosterone, sex hormone binding globulin levels and albumin. Age specific ranges were separated into 10-year intervals, with exception of the final interval being all men  $\geq 80$  years old.

**RESULTS:** 1,147 men were included in our final cohort. For each age category, we observed large differences in individual FT levels (Table 1). The highest levels of FT were observed in the youngest category (mean 114.3 pg/mL) and declined on average 12.7% each

decade to a mean of 45.8 pg/mL in men  $\geq 80$  years old. The largest decline in average FT was observed from 20s to 30s with an average decline of 16.9% (Figure 1).

**CONCLUSIONS:** To our knowledge, this is the first study to evaluate age specific calculated FT ranges in adult men. There is a consistent decline in FT in adult men with peak FT concentrations in their 20s. The large range of FT levels within each category indicates the need for a prospective study to identify factors that contribute to declining FT levels and to aid in the clinical diagnosis of testosterone deficiency.

Age Range (Years)	N	Distribution Percentiles of Free Testosterone (pg/mL)						
		2.5 <sup>th</sup>	5 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	97.5 <sup>th</sup>
20-29	223	64.3	68.0	91.7	111.5	133.1	155.1	170.8
30-39	201	40.5	56.0	80.1	95.4	110.8	132.3	149.1
40-49	179	48.6	52.7	73.1	88.7	101.2	112.8	119.0
50-59	195	43.1	47.0	66.4	78.0	91.5	105.3	113.9
60-69	184	28.9	37.8	58.0	70.1	83.4	96.4	104.6
70-79	97	37.0	39.3	50.0	61.4	73.1	79.9	84.4
$\geq 80$	68	4.9	8.7	33.0	47.0	59.7	70.4	77.4



**Source of Funding:** None

## PD28-06

### THE EFFECT OF COMBINATION TREATMENT WITH LOW-INTENSITY SHOCKWAVE THERAPY AND DAILY LOW-DOSE TADALAFIL ON SEVERE ERECTILE DYSFUNCTION: A DOUBLE-BLIND, RANDOMIZED, SHAM-CONTROLLED CLINICAL TRIAL

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**INTRODUCTION AND OBJECTIVE:** To assess the role of combination therapy with low-intensity shockwave therapy (LiST) and tadalafil on severe vasculogenic erectile dysfunction (ED) through a double-blind, randomized trial.

**METHODS:** Forty-eight sexually active males were randomly assigned to twelve sessions of LiST three times weekly and tadalafil 5 mg once daily (n=33) or sham-therapy and tadalafil (n=15) for four weeks. Patients were assessed at one and three months after completion of treatment. Improvement of erectile function was evaluated through the International Index of Erectile Function – Erectile Domain (IIEF-EF) and the Sexual Encounter Profile (SEP) diaries. The number of patients attaining a minimal clinically important difference (MCID) in the IIEF-EF, as well as the safety of treatment were also assessed.

**RESULTS:** Adjusting for the baseline values, IIEF-EF improved by 3.1 points (95%CI: 2-4.3,  $p < 0.001$ ) at one month and 3.2 points (95%CI: 2.1-4.3,  $p < 0.001$ ) at three months in patients receiving LiST and tadalafil versus sham-therapy and tadalafil. Between the two

groups, the proportion of “yes” responses to question 3 of SEP diaries was not statistically significant, whereas the number of patients attaining a MCID in the IIEF-EF was statistically significant only at the 3-month evaluation. No adverse events occurred.

**CONCLUSIONS:** Combination of LiST three times weekly and daily, low dose tadalafil for four weeks may further ameliorate severe vasculogenic ED compared to tadalafil monotherapy, without compromising safety. Nevertheless, additional high-quality trials are mandatory to corroborate our findings.

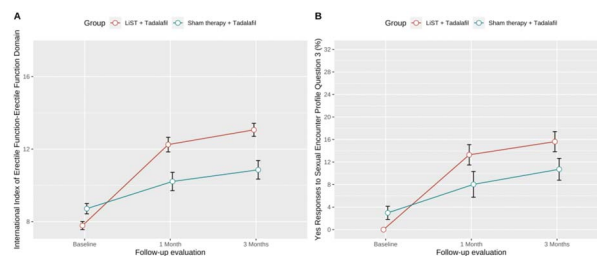


Figure 1a: The effect of LiST + tadalafil versus sham therapy + tadalafil on the International Index of Erectile Function-Erectile Domain. LiST: Low-intensity Shockwave Therapy.

Figure 1b: The effect of LiST + tadalafil versus sham therapy + tadalafil on “Yes” responses to Sexual Encounter Profile Question 3. LiST: Low-intensity Shockwave Therapy.

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## PD28-07

### IDENTIFYING PREDICTORS OF BONE DENSITY LOSS IN MEN WITH LOW TESTOSTERONE

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**INTRODUCTION AND OBJECTIVE:** Bone density loss (BDL), is associated with low testosterone (T). We aimed to identify predictors of BDL in this cohort of patients.

**METHODS:** The sample included (i) men  $\geq 50$  years old (ii) with low total T levels ( $< 300$  ng/dL using LCMS on 2 early morning blood draws) (iii) who had dual-energy X-ray absorptiometry (DEXA) within 6 months of T measurement. Men with prior T therapy were excluded. On DEXA, osteopenia was defined as a T score -1.1 to -2.5, osteoporosis T score lower than -2.5. Additionally, demographics and comorbidity data, diabetes, sleep apnea, coronary artery disease (CAD), hypertension, dyslipidemia and smoking status were collected. We report rates and attempt to define predictors of any BDL using multivariable analysis (MVA), including age, comorbidities  $\geq 3$  (yes), and total T levels  $\leq 100$  ng/dL (yes).

**RESULTS:** 512 men were analyzed, mean age of  $65 \pm 5$  years. Median total T was 223 (175, 262) ng/dL, free T 4.5 (2.8, 7.9) ng/dL, and estradiol 17 (13, 23) pg/mL. 6% had a total T  $\leq 100$  ng/dL. Median number of comorbidities was 2 (1, 3). 57% hypertension, 57% dyslipidemia, 40% reported OSA, 24% had diabetes, and 8% reported CAD. 34% of the men had  $\geq 3$  comorbidities. 44% were former or current smokers. BDL was present in 36% of the patients. 91% had osteopenia, and 9% had osteoporosis. On MVA, significant predictors of BDL were older age, presence of  $\geq 3$  comorbidities and the presence of total T  $\leq 100$  ng/dL (Table 1).

**CONCLUSIONS:** In our cohort of men with low T, one third had BDL, and we have identified key predictors of this occurrence, older age, higher number of comorbidities and profoundly low T.