

## ORIGINAL RESEARCH—PEYRONIE'S DISEASE

# Peyronie's Disease among Men Who Have Sex with Men: Characteristics, Treatment, and Psychosocial Factors

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### ABSTRACT

**Introduction.** We describe the characteristics of Peyronie's disease (PD) and its associated psychosocial implications in men who have sex with men (MSM).

**Aim.** The aims of this article are to identify presenting characteristics and treatment for MSM with PD, compare these findings to non-MSM PD patients, and determine the psychosocial impact of PD among MSM.

**Main Outcome Measures.** Subjective and objective presenting characteristics, MSM psychosocial factors.

**Methods.** We identified 27 MSM with PD presenting from 2000 to 2012 through a retrospective chart review. A random selection of 200 non-MSM PD patients was identified, who presented during the same time period. A prospective nonvalidated questionnaire was given to MSM PD patients for evaluation of psychosocial constructs.

**Results.** A traumatic event leading to activation of PD was identified equally among MSM and non-MSM ( $P = 0.815$ ). Most common recognized activators of PD among MSM were: penetrative sexual intercourse (22.2%), self-stimulation (11.1%). More MSM presented with the primary complaint of penile deformity, including narrowing, indentation, hourglass, and hinge (11.1% MSM vs. 1.0% non-MSM,  $P = 0.01$ ). No differences in total curvature, erection grade were found ( $P > 0.05$ ). PD had a negative effect on emotional status (89.0% MSM, 80.5% non-MSM,  $P > 0.05$ ) and intimate relationships (45.0% MSM, 64.0% non-MSM,  $P > 0.05$ ). Nonsurgical treatment was given to 88.9% MSM and 76.5% non-MSM ( $P > 0.05$ ), and corrective surgery in 29.6% MSM and 25.0% non-MSM ( $P > 0.05$ ). Of the 75.0% of MSM engaging in anal sex, 41.7% reported penetrative anal intercourse as the activator of PD. Among MSM, 31.3% experienced decreased libido, 50.0% decreased frequency of sexual activity, 92.9% were self-conscious about the appearance of their penis, and 92.9% were dissatisfied with the size of their penis.

**Conclusions.** Few differences exist in the clinical presentation and treatments used between MSM and non-MSM PD patients. There was evidence of emotional distress in both groups. As a result, psychosexual assessment and treatment, when indicated, should be considered essential to the patient presenting with PD. **Farrell MR, Corder CJ, and Levine LA. Peyronie's disease among men who have sex with men: Characteristics, treatment, and psychosocial factors. J Sex Med 2013;10:2077–2083.**

**Key Words.** Peyronie's Disease; Men Who Have Sex with Men; Characteristics; Treatment; Psychosocial Factors; Tunica Albuginea of the Corpora Cavernosa

### Introduction

First observed by Fallopius and Vesalius in 1561, induracio penis plastica was later described and treated by Francois de la Peyronie in 1743, after whom the disease was ultimately named [1]. Peyronie's disease (PD) is currently regarded as a wound healing disorder associated

with the formation of a fibrous inelastic scar within the tunica albuginea of the corpora cavernosa [2]. Patients with PD may present with penile deformity, including curvature, shortening, narrowing, and hinge effects, and often have difficulty with erections and sexual function [3]. The overall prevalence of PD has recently been described at 8.9%, with a mean age of onset of 50 years or older

[4–6]. The definitive mechanism for the development of PD has not been fully elucidated, as research into the etiology of PD is ongoing. Coital trauma and erectile dysfunction have been established as independent risk factors for PD [7].

In addition to the penile deformity associated with PD, the negative psychosocial experience for patients with PD carries important weight. Erectile dysfunction has been reported in up to 80% of men with PD, while individuals with erectile dysfunction have been found to have a significantly poorer quality of life [8,9]. PD has been demonstrated as a cause of clinical depression with up to 48% of men with PD having evidence of clinically meaningful, moderate-to-severe depression [10]. However, in relation to the general population of PD patients, the differing sexual activity patterns of men who have sex with men (MSM) necessitate independent investigation of the comprehensive experience with PD. PD and the associated erectile dysfunction may have a substantial psychosocial impact on MSM as they engage in relationships and sexual activity.

Although PD has been extensively studied in the general population of men, there is no data in the literature to describe the characteristics of PD and its associated psychosocial implications in MSM. In the current study, we describe a 12-year experience with the evaluation and treatment of MSM with PD at a tertiary medical center and compare our findings in the MSM population to a non-MSM population during the same time frame at the same institution. Furthermore, we describe the psychosocial impact of PD in MSM to aid clinicians in the evaluation and treatment of MSM with PD.

### **Aims**

The aim of this study was to identify the presenting characteristics and treatment for MSM with PD and to compare these findings to non-MSM PD patients. In addition, we aimed to determine the psychosocial impact of PD among MSM.

### **Methods**

This study is designed as a review of a prospectively developed database of all patients presenting with PD to our tertiary PD referral clinic. We retrospectively analyzed this database for males who self-identified as MSM and presented for evaluation between 2000 and 2012. MSM patients were identified using an internally gen-

erated, published but nonvalidated questionnaire as those who answered “men” to the question, “What is your sexual partner preference?” with the options “women,” “men,” or “both.” [10] MSM patients were compared with a random selection of 200 non-MSM patients from our database who presented for evaluation during the same time period. Randomization of the non-MSM cohort was achieved using a random number generator. A larger sample size was utilized in the non-MSM cohort to increase statistical power. Complete data were available for all included subjects. Informed consent was obtained from all subjects in this study at the time of initial patient visit.

Demographic characteristics, complete medical history, and an internally generated, published but nonvalidated questionnaire with the purpose of evaluating the patient’s perception of penile curvature and length were reviewed [11]. Subjective data reflected patient-reported data, while objective data were collected by a single urologist. Medical data included risk factors for PD, patient-reported mechanism activating the PD, symptomatology, objective morphology, and treatment. Oral, injection, and topical therapy were each recorded as dichotomous variables noted as affirmative if one or more of the following treatments were given: oral therapy: vitamin E, colchicine, L-carnitine, L-arginine, potaba, pentoxifylline, and nonsteroidal anti-inflammatory drugs (NSAIDs); injection therapy: verapamil; topical therapy: verapamil gel and transdermal electromodal drug administration with verapamil with or without dexamethasone. Combination therapy was recorded as a dichotomous variable and was noted as affirmative if all of the following treatments were given: intralesional verapamil injection, external penile traction, oral L-arginine and/or pentoxifylline [12]. Intention-to-treat analysis was used for all therapies.

Evaluation included penile duplex ultrasound with injection of papaverine, or tri-mix injection, which was performed on all subjects to achieve a full erection equal to or better than the patient’s sexually induced erection. Measurements in the erect state included girth measured with a string, presence of hinge effect, and total curvature calculated as the sum of the measured curve in the dorsal/ventral or left/right lateral direction. Flaccid stretched penile length was measured from the pubis to the corona via the dorsal aspect with the penis on stretch at 90 degrees from the patient’s abdomen, as this technique has been established as the best approximation of erect penile length [13].

All patients were asked two “yes/no” questions to investigate the effects of PD on emotional status and relationships as generated by Smith et al. [14]:

1. Do you feel that the presence of PD has affected your emotional status?
2. Has the presence of PD affected your relationship with your sexual partner?

MSM patients were given a specific nonvalidated PD questionnaire with the purpose of addressing prior treatments, subjective self-evaluation of their PD penis, satisfaction with current treatment, improvement of sexual activity with treatment, and participation in penetrative anal intercourse.

### Statistics

Data analysis was conducted using PASW Statistics 18 software (SPSS, Inc., Chicago, IL, USA). A Shapiro–Wilk test was performed for normality. If continuous data followed a normal distribution, a two-sample *t*-test was performed to determine differences between MSM and non-MSM. Data that did not follow a normal distribution were analyzed using a Wilcoxon rank-sum test. Associations across categorical variables were evaluated using Pearson's chi-squared test or Fisher's exact test when there were fewer than five observations in table cells. Normally distributed continuous variables were reported as mean and standard deviation, while median and range were reported for variables not following a normal distribution. Categorical data were shown as counts and percentages. For all analyses, variables are considered significant predictors if the *P*-value associated with the appropriate test statistic is <0.05.

### Main Outcome Measures

Presenting characteristics of MSM and non-MSM populations can be separated into subjective and

objective categories. Subjective outcome measures include presumed mechanism of PD activation, penile shortening, pain, erect penile deformity, and pre- and post-PD erection quality. Objective outcome measures include pretreatment-stretched penile length, girth, curvature, erection grade (0–10) during vasoactive drug-induced erection, plaque location, and treatment modality. MSM and non-MSM cohorts were evaluated for the impact of PD on emotional status and intimate relationships. A nonvalidated questionnaire given to MSM with PD evaluated prior PD treatments, sexual practices, subjective self-evaluation of the PD penis, improvement of sexual practice with treatment, and satisfaction with treatment.

### Results

A total of 27 MSM with PD were self-identified in whom complete records were available for review over a period of 12 years. This represents 2.6% of all PD patients in our clinic database. The median age for the MSM cohort was 47 years (range 24–68). There were no statistical differences between the MSM and non-MSM populations regarding age and duration of disease at time of presentation (Table 1). A smaller proportion of MSM had hypertension (11.1% MSM vs. 30.0% non-MSM, *P* = 0.04), while more MSM were HIV-positive (11.1% MSM vs. 0% non-MSM, *P* < 0.01). Evaluation of other comorbidities and tobacco use revealed no differences between groups (Table 1).

A traumatic event leading to activation of PD could be identified equally among MSM and non-MSM (37.0% MSM vs. 41.5% non-MSM, *P* = 0.815). Among MSM, penetrative sexual intercourse (22.2%) and self-stimulation (11.1%) were the most common recognized activators of PD (Table 2).

**Table 1** Patient characteristics

	MSM (n = 27)	Non-MSM (n = 200)	<i>P</i> -value
Age (years), median (range)	47 (24–68)	53 (15–70)	0.124
Duration of disease (months), median (range)	6 (1–132)	12 (0–144)	0.730
Comorbidities, n (%)			
Hypercholesterolemia	7 (25.9)	73 (36.5)	0.280
Hypertension	3 (11.1)	60 (30.0)	<b>0.041</b>
HIV-positive	3 (11.1)	0 (0)	<b>0.002</b>
Coronary artery disease	2 (7.4)	18 (9.0)	1.000
Diabetes mellitus	1 (3.7)	28 (14.0)	0.216
Peripheral vascular disease	1 (3.7)	0 (0)	1.000
Radical prostatectomy	0 (0)	1 (0.5)	1.000
Social history, n (%)			
Tobacco	10 (37.0)	86 (42.0)	0.556

Bolded *P* values in the tables indicate variables of statistical significance.  
HIV = human immunodeficiency virus; MSM = men who have sex with men

**Table 2** Recognized activators of Peyronie's disease

	MSM (n = 27)	Non-MSM (n = 200)	P-value
Penetrative sex, n (%)	6 (22.2)	68 (34.0)	0.314
Self stimulation, n (%)	3 (11.1)	6 (3.0)	0.078
Oral sex, n (%)	1 (3.7)	0 (0)	0.119
Accident, n (%)	0 (0)	9 (4.5)	0.604
Unknown mechanism, n (%)	17 (63.0)	118 (59.0)	0.853
Any traumatic event, n (%)	10 (37.0)	83 (41.5)	0.815

MSM = men who have sex with men

Penile curvature (96.3% MSM vs. 89.0% non-MSM) and shortening (70.4% MSM vs. 70.0% non-MSM) were the most common subjective presenting symptoms ( $P > 0.05$ ). A greater proportion of MSM presented with penile deformity including narrowing, indentation, hourglass, and hinge as their primary complaint (11.1% MSM vs. 1.0% non-MSM,  $P = 0.01$ ). Analysis of specific subjective presenting symptoms including pain, lump, erectile dysfunction, loss of length, narrowing,

indentation, hourglass, hinge, and distal softening revealed no differences (Table 3).

Subjective patient grading of erection quality with 0 corresponding to no erection and 10 corresponding to fully rigid resulted in no differences between MSM and non-MSM cohorts prior to or after onset of PD. Additionally, the difference between median pre-PD and post-onset PD erection scores were the same for MSM and non-MSM cohorts (Table 3).

Objective morphology showed that MSM had greater median pretreatment stretch length (11.5 cm vs. 10.5 cm,  $P < 0.01$ ) and median pretreatment girth (12.0 cm vs. 11.0 cm,  $P = 0.01$ ); however, no differences existed in total curvature and erection grade (Table 4). The most common plaque location for both cohorts was dorsal (48.1% MSM vs. 66.5% non-MSM) with no differences in plaque location other than circumferential (7.4% MSM vs. 0% non-MSM,  $P = 0.01$ ) (Table 4).

**Table 3** Subjective presenting symptoms and patient complaints

	MSM (n = 27)	Non-MSM (n = 200)	P-value	
Curvature, n (%)	26 (96.3)	178 (89.0)	0.238	
Shortening, n (%)	19 (70.4)	140 (70.0)	0.969	
Pain, n (%)	9 (33.3)	58 (29.0)	0.643	
Narrowing, n (%)	9 (33.3)	53 (26.5)	0.454	
Hinge, n (%)	6 (22.2)	67 (33.5)	0.239	
Hourglass, n (%)	6 (22.2)	52 (26.0)	0.673	
Lump, n (%)	5 (18.5)	41 (20.5)	0.810	
Softening distal to plaque, n (%)	4 (14.8)	45 (22.5)	0.461	
Erectile dysfunction, n (%)	3 (11.1)	6 (3.0)	0.078	
Deformity, n (%)	3 (11.1)	2 (1.0)	<b>0.013</b>	
Erection quality, median (range)	Pre-PD	10 (4–10)	10 (0–10)	0.335
	Post-PD	8 (3–10)	8 (0–10)	0.638
	Delta	2 (0–5)	2 (0–9)	0.503
Loss of length (cm), median (range)	2.5 (1.3–7.6)	2.5 (0.5–12.7)	0.876	

Bolded  $P$  values in the tables indicate variables of statistical significance.  
MSM = men who have sex with men

**Table 4** Objective morphology

	MSM (n = 27)	Non-MSM (n = 200)	P-value	
Pretreatment stretch length (cm), median (range)	11.5 (7.0–14.5)	10.5 (7.0–15.0)	<b>0.007</b>	
Pretreatment girth (cm), median (range)	12.0 (9.5–15)	11.0 (8.0–15.5)	<b>0.011</b>	
Plaque location, n (%)	Dorsal	13 (48.1)	133 (66.5)	0.057
	Septal	2 (7.4)	3 (1.5)	0.110
	Circumferential	2 (7.4)	0 (0)	<b>0.014</b>
	Dorsal cord	2 (7.4)	3 (1.5)	0.110
	Ventral and dorsal	2 (7.4)	10 (5.0)	0.641
	Left	1 (3.7)	11 (5.5)	1.000
	Ventral	1 (3.7)	11 (5.5)	1.000
	Right	0 (0)	6 (3.0)	1.000
Total curvature (degrees), median (range)	30.0 (0.0–100.0)	45.0 (0.0–140.0)	0.226	
Erection grade, median (range)	8 (4–10)	8 (4–10)	0.288	

Bolded  $P$  values in the tables indicate variables of statistical significance.  
MSM = men who have sex with men

Eighty-nine percent of MSM and 80.5% of non-MSM patients identified that PD negatively affected their emotional status ( $P > 0.05$ ). Intimate relationships were negatively affected by the presence of PD as identified by 45% of MSM and 64% non-MSM ( $P > 0.05$ ).

Nonsurgical treatment was administered to 88.9% of MSM and 76.5% of non-MSM patients ( $P > 0.05$ ). A greater proportion of MSM received oral therapy (70.4% vs. 27.0%,  $P = 0.02$ ), which included vitamin E, colchicine, L-carnitine, L-arginine, potaba, pentoxifylline, and NSAIDs. No differences were identified in use of injection therapy including verapamil and interferon (44.4% MSM vs. 55.5% non-MSM,  $P > 0.05$ ) or topical therapy including iontophoresis and topical verapamil (3.7% MSM vs. 4.0% non-MSM,  $P > 0.05$ ). Traction therapy was utilized more often by MSM (59.3% MSM vs. 25.5% non-MSM,  $P < 0.01$ ), while vacuum therapy (3.7% MSM vs. 14.5% non-MSM,  $P = 0.22$ ) was non-differentially utilized. Corrective surgery was performed in 29.6% of MSM and 25.0% of non-MSM ( $P > 0.05$ ). There were no differences in the surgical approaches performed including plication (18.5% MSM vs. 12.5% non-MSM,  $P > 0.05$ ), inflatable penile prosthesis (3.7% MSM vs. 4.5% non-MSM,  $P > 0.05$ ), and grafting (14.8% MSM vs. 12.5% non-MSM,  $P > 0.05$ ). Combination therapy was given to MSM patients more often than non-MSM (33.3% MSM vs. 11.0% non-MSM,  $P < 0.01$ ).

Our nonvalidated questionnaire was completed by 59.3% of MSM patients. Sixty-nine percent had previously been evaluated for their PD by a health-care professional of which 36.4% were treated with vitamin E, 18.2% were referred to our department, and 9.1% were told that there was no treatment that could be offered. On average, two health-care professionals were seen prior to visiting our office. Of the 75.0% of MSM engaging in penetrative anal intercourse, 41.7% reported penetrative anal intercourse as the recognized activator of PD. Following onset of PD, 31.3% of MSM experienced a decrease in libido, 50.0% reported decreased frequency of sexual activity, 92.9% were self-conscious about the appearance of their penis, and 92.9% were dissatisfied with the size of their penis.

Overall, 87.5% of MSM were satisfied with the treatment modality. Seventy-five percent of those undergoing surgery were satisfied with the treatment. When asked if they would undergo treatment again, 84.6% of the overall MSM population

agreed or strongly agreed, while 66.7% of MSM who underwent surgery and 81.8% of MSM who underwent nonsurgical treatment agreed or strongly agreed. Following treatment, 53.3% of the overall MSM population agreed or strongly agreed that their sex life improved, while 75.0% of MSM who underwent surgery and 45.5% of MSM who underwent nonsurgical treatment agreed or strongly agreed.

## Discussion

Although PD is well defined in the literature with respect to the general male population, PD has not been investigated specifically among MSM. Our goal for this study was to compare the presenting characteristics and treatments of MSM to the non-MSM population. We further aimed to describe the psychosocial factors associated with PD with the intention of better understanding the experience of PD for MSM patients.

The most widely accepted theory of PD activation is microtrauma to the penis [15–17]. In the present study, there was no significant difference between MSM and non-MSM with regard to the proportion of patients who attributed activation of PD to a traumatic event. Previously, Bjekic et al. reported that approximately one quarter of the 82 PD patients in their study population identified accidental genitoperineal injury prior to onset of PD [18]. Other studies have indicated trauma to the flaccid or erect phallus in 21.5–40% of PD patients [15,17]. Our results place the MSM population within this range (37.0%), while the non-MSM population was found to be slightly above this range (41.5%). These findings may suggest that overall, there is a nondifferential risk of traumatic penile injury leading to PD between the two cohorts.

Among the MSM in our study who engaged in penetrative anal intercourse, a considerable proportion reported this activity as the mechanism of PD activation. The 2002 National Survey of Family Growth found that 38% of American men reported ever having penetrative anal intercourse with a female [19]. Seventy-five percent of our MSM study population engaged in this sexual activity, with 41.7% of these men associating penetrative anal intercourse with the activation of PD. Penetrative anal intercourse may include the potential for an increase in resistance relative to coitus. We feel that participation in penetrative anal intercourse is an important risk factor consideration for the development of PD in MSM.

It should be noted that a substantial proportion of both MSM and non-MSM cohorts reported no recognized activating event, which may be accounted for by other risk factors and suggested mechanisms for PD including silent, unrecognized trauma [20].

The MSM population received oral therapy, traction, and combination therapy more often than non-MSM. It should be noted that all prior nonsurgical treatment was included in our data and that our clinic does not offer vitamin E, topical verapamil gel treatment, or vacuum therapy. While this analysis offers an ecological snapshot of the MSM and non-MSM populations with respect to their treatment received, it does not necessarily reflect the treatment modalities of our PD clinic. Most of the reported oral therapy in both populations was from other physicians prior to presentation to our clinic. Additionally, the MSM cohort sought treatment from a mean of two physicians prior to presentation at our clinic, which may reflect the awareness and proactiveness of this population with respect to their sexual health and PD, as 93% reported that they were self-conscious about the appearance of the penis and 93% were not satisfied with the size of their penis.

The psychosocial impact of PD is an important consideration in the approach to the PD patient. Through longitudinal focus group interviews, Rosen et al. established that PD has a negative impact on physical and sexual attractiveness. PD decreased perceptions of virility along with sexual confidence while raising fear of inability to initiate sex and causing withdrawal from all forms of sexual interaction [21]. Reports of depressive symptoms have been shown in 48% of PD patients, with 26% reporting moderate and 21% reporting severe depression through utilization of the validated Center for Epidemiologic Studies Depression (CES-D) Depression Questionnaire. Additionally, a significant predictor of depression in men with PD is patient reporting of penile shortening associated with having PD [10,22]. Therefore, it is notable that 93% of MSM patients in the current study reported dissatisfaction with the size of their penis. Smith et al. found that PD negatively affected the patient's emotional status in 81% of study subjects and that PD affected the patient's relationship with their sexual partner in 54% of study subjects [14]. The current study found similarly high proportions of both MSM and non-MSM populations reporting a negative impact on their emotional status and relationship with a

sexual partner when asked the same questions as established by Smith et al.

Patient satisfaction with treatment was evaluated among MSM and stratified according to nonsurgical and surgical modalities. A greater proportion of patients undergoing nonsurgical relative to surgical treatment agreed that they were satisfied with the treatment received. When asked if they would undergo treatment again, a greater proportion of patients receiving nonsurgical treatment agreed relative to the surgery cohort. Importantly, a greater proportion of the surgery cohort agreed that their sex life improved with treatment. This finding is perhaps the result of surgery being a more definitive treatment for PD in restoring sexual function. Patient satisfaction following any treatment for PD may be compromised by unrealistic expectations for the full return of their pre-PD penis.

Our study offers initial insight into the experience of PD among MSM; however, our findings may be limited by our sample size of 27 representing the MSM population. Nonetheless, this sample is inclusive of all self-identifying MSM patients presenting to our highly specialized PD clinic in the setting of a tertiary academic medical center over a 12-year period. MSM patients represented 2.6% of all PD patients in our database—a proportion similar to the 3.2% of the U.S. population engaging in male-to-male sex within the past year as reported in the General Social Survey [23]. Further, we utilized a nonvalidated questionnaire to gain insight into the MSM population, as there is currently no validated questionnaire available for this subject. Other potential limitations include the response rate to our MSM questionnaire of 59.3%, allowing for potential response bias, and the representative experience of a single tertiary referral clinic that may reflect more severe disease and a more proactive patient population.

## Conclusions

Our study is the first to describe the characteristics, treatment course, and psychosocial impact of PD in the MSM population. Although few differences were found in the characteristics and treatment between the MSM and non-MSM study populations, there were notable findings of psychosocial distress in both cohorts. The authors suggest that these findings underscore attention to psychosocial consequences as a critical aspect of PD treatment.

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**Conflict of Interest:** Dr. L.A. Levine: Auxilium—consultant, speaker, investigator; Coloplast—consultant, speaker; American Medical Systems—consultant; Actient—consultant; Absorption Pharmaceuticals—consultant. Dr. C.J. Corder and M.R. Farrell: None

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