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Peyronie's Disease in People of African Origin: A Mini Review

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Abstract

Peyronie's disease is a connective tissue disorder of the penile tunica albuginea that results in the formation of a palpable scar or hard plaque. Studies on Peyronie's disease have found varying prevalence rate that is influenced by the method of survey, the sub population under study and the presence of co-morbidities among the study subjects. These studies seem to suggest that Peyronie's disease is uncommon in people of black African origin. This formed the basis of Medline and a Google Scholar data base search of existing literature to find variations in the demography, clinical presentation, aetiology, plaque characteristics, treatments and outcomes of people of black ancestry with Peyronie's disease. Very few publications on Peyronie's disease with racial stratification and comment on parameters of interest were found. Existing cross-sectional studies does not seem to reveal any difference in the percentage prevalence of Peyronie's disease in people of black African origin compared to Caucasians (p = 0.923; p = 0.504). A report indicates a variation in response to intralesional collagenase clostridium histolyticum injection in African Americans compared to Caucasians.

Keywords: Peyronie's disease; Epidemiology; Racial; African; Blacks; Management

Introduction

Peyronie's disease (PD) is a progressive fibrotic tissue disorder with unknown etiology [1,2]. It is a connective tissue disorder of the penile tunica albuginea that results in the formation of a palpable scar or hard plaque [1]. Transforming growth factor beta (TGF-β) has been suggested as the cytokine that influences the deposition of extracellular matrix and induces fibrosis in the tunica albuginea [3]. Peyronie's disease is classified into 2 phases: an acute inflammatory phase that persists for approximately 6 to 18 months, in which patients present with pain, slight penile curvature, and nodule formation; and a chronic phase in which patients present with stable plaque size, penile curvature, and in some instances, complete erectile dysfunction [4].

The acute phase has been noted to resolve though the percentage of resolution has been noted to be lower than previous thought [5]. The study reported that 13% of the patients with PD will gradually resolve, 47% will remain stable, and 40% will worsen [5].

Variations in Peyronie's disease prevalence rate have been observed. This is influenced by the method of survey, the sub population under study and the presence of co-morbidities. The prevalence has ranged from 0.39–20.3% [6,7]. These studies seem to suggest that Peyronie's disease is uncommon in people of black African origin compared to Caucasians. Variations in the demography, clinical presentation, possible aetiology, plaque characteristics, treatments and outcomes are hardly known for people of black ancestry. We set out to find out these parameters as related to blacks in existing literature.

We performed a Medline and a Google Scholar data base search using the key words: Peyronie's disease, epidemiology, racial, blacks, Africa, conservative treatment, and surgery. Papers published in English from January 1990 to June 2017 were considered. Each study identified was reviewed to see if racial stratification was performed and if performed, the parameters of interest which included the population numbers, percentage prevalence rates (calculated if not stated), presentation and treatment outcomes as related to blacks was documented.

Studies

Very few studies have reported on the demography, clinical presentation, possible aetiology, plaque characteristics, treatments and outcomes of people of African origin with Peyronie's disease. Seven studies were identified that reported on aspect of Peyronie's disease that related to people of African origin. Three of the studies reported on population based prevalence of the disease and four of the studies were case series.

Prevalence of the Disease in People of African Origin

Rhoden EL, et al. [8] in a Brazil study involved the population of 954 men found thirty Caucasians and four Blacks had Peyronie's disease. A study by DiBenedetti DB, et al. [9] with participants from the KN online panel using a web based questionnaire recruited 11,420 respondents. Those previously diagnosed or treated for Peyronies disease, the racial distribution was 96.2% Caucasians and 3.8% Blacks while those with symptoms suggestive of Peyronies disease, 84.6% were Caucasians and 15.4% were blacks [9]. In a prospective study, Saa- Ghandi, et al. [10] surveyed 1030 men attending two screening clinics for prostate cancer and found 83.3% of Peyronie's disease cases to be of African origin based on their diagnostic criteria.

Aisuodionoe SOI, et al. recorded two cases of Peyronie's disease out of 2167 urology clinic attendants over a 4-year period in a specialist hospital in Nigeria (Adult male clinic attendants were 1903) [11]. Calculated percentage prevalence rate of Peyronie's disease based on the above studies is as shown in table 1.

Two other reports of Peyronie's disease from Africa were identified. A case series involving three patients [12] and a case report [13]. In the cross-sectional population based studies by Rhoden EL, et al. [8] and DiBennetti DB, et al. [9] that included stratification of people of African origin, calculated percentage prevalence rate of Peyronies diseases in Caucasians compared to people of African origin was not statistically significant; Fishers Exact Test = 0.591, p = 0.923 and Fishers Exact Test = 0.361, p = 0.504 respectively (Table1). Though there was a slight increase in relative risk in Caucasians, it was not statistically significant.

It has been observed that the actual occurrence of this disease within the general population may be higher due to patients' reluctance to come to their physician for treatment and be diagnosed of this embarrassing condition [14]. This is relevance in people of African descent as DiBenedetti DB, et al. [9] found that they were more likely to have symptoms suggestive of Peyronie's disease that had not been evaluated for a definitive diagnosis to

Study	Total population	Total Caucasian	Caucasian with Peyronies Disease	Prevalence Caucasian (%)	Total Blacks	Blacks with Peyronies Disease	Prevalence Blacks (%)	*p* - value
Rhoden EL, et al. [8]	954	840	31	3.6	114	4	3.5	Fishers exact test = 0.591 $p = 0.923$
DiBenedetti DB, et al. [9]	11420	9803	76	0.7	571	3	0.5	Fishers exact test = 0.361 $p = 0.504$
Saa-Gandi F, et al. [10]	1030	N/A	N/A	-	701	10	1.4	-
Aisuodionoe-Shadrack OI. [11]	1903	N/A	N/A	-	1903	2	0.1	-

Table 1: The percentage prevalence of Peyronies disease in people of African origin in literature.

Study	Total population	Total Caucasian	Caucasian with PD	Prevalence Caucasian (%)	Total Blacks	Blacks with PD	Prevalence blacks (%)	*p* - value
DiBenedetti DB, et al. [with symptoms no diagnosis] [9]	11420	9803	137	1.4	571	25	4.4	Pearson Chi-Square $(X^2) = 31.187$ $p < 0.001$

Table 2: The percentage prevalence of symptoms suggestive of Peyronies disease in people of African origin.

have been made. A calculated prevalence rate from their web based study was 4.4% compared to 1.4% in Caucasians ($p < 0.001$) [9] (Table 2).

Limited understanding of PD in the medical community has been noted also to contribute under diagnosis [9]. The role of urologist in establishing diagnosis has been highlighted. Muhall JP, et al. [15] found in their study that approximately in one third of the patient's condition was unrecognized, which they considered as underscored the role of urologists in the screening process [15]. This may have contributed to the low reports from the African continent as access to urologist is limited. It has been observed that people of African origin in environments that may have the requisite facilities for diagnosis of Peyronie's disease, were significantly not likely to report [9].

Age at Diagnosis

Peyronie's disease is common in middle age. The mean age for the presentation in Caucasians and people of African origin were in the 6th decade. In the cross-sectional studies, the mean ages taking all races into consideration were 59.6 years with a median of 60 years in the study by DiBenetetti DB, et al. [9] and 62 years in the Brazilian study by Rhoden EL, et al. [8]. The mean age of the four cases of Peyronie's disease reported from Nigeria was 58.3 years [12,13]. Peyronie's disease has been diagnosed in teenagers [16]. Its prevalence in the younger age groups of African origin is yet to be determined.

Aetiology and Presentation

The pathophysiology, diagnosis and treatment of Peyronie's disease remains to be established completely [17]. Currently it is postulated that it might result from trauma at sexual intercourse or masturbation. Inflammatory conditions might also lead to the replacement of the elastic tissues of the tunica albuginea with fibrous tissue. With TGF-β considered to play a key role [3]. Genetic predisposition has also been suggested. An association with Dupuytren's contracture as well as hypertrophic scars and keloids has led to suggestion of abnormal wound healing involving TGF β-1 and other profibrotic factors [18,19]. These factors may also be at play among Africans as the presence of hypertrophic scars was seen in two of the cases reported by Takure, et al. [12].

Both acute phase and stabilized cases have been noted in those of African origin. With regards to time of presentation Delay K, et al. [20] found a significant difference between racial groups with the duration of PD, being shorter for Africa American patients at an average of 5.4 ± 4.45 months duration compared to an average of 30.5 ± 63.1 months duration in Caucasian patients ($p = 0.0025$) [20]. The duration at time of presentation for the four reported cases from Nigeria were 2 months, 5 months, 2 years and 5 years [12,13]. The presentation by two of the cases was a finding of a plaque during evaluation for lower urinary tract symptoms with the other two cases reporting with erectile dysfunction. In these reports, the only associated co-morbid factors were hypertension and diabetes mellitus (Figure 1).

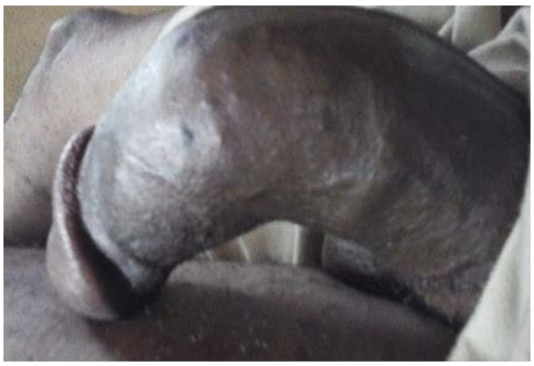

Figure 1: Legend- 59 year old Ghanaian with Peyronie's disease causing a ventral chordee.

Diagnosis and Treatment

Diagnosis of Peyronie's disease is made by history, physical examination to identify the plaques, measurement of angle of curvature either photographor with injection of vasoactive agent such as papaverine. The injection of vasoactive agents permits an accurate assessment of disease severity (including complex curvatures, hour-glass deformities, indentations), to measure penile length, and to select appropriate management options. The use of doppler ultrasonography evaluates the penile vascular parameters if there is an associated erectile dysfunction [21]. It has been found to be inaccurate in determining plaque size and therefore not recommended for routine clinical practice [22–24]. These diagnostic studies were used in the reported studies to decide the treatment plan[10,12,13,20].

The acute phase is managed conservatively. Oral potassium para-aminobenzoate may lead to significant reduction in plaque size, penile pain and stabilization of penile curvature. Penile curvature and plaque size may be improved with Topical verapamil gel 15%. Intralesional injection using verapamil, clostridium collagenase, and interferon may improve penile curvature, plaque size/volume, plaque density and pain [24]. Extra corporeal shock wave therapy may be indicated for reducing penile pain [25] while external traction or vacuum therapy may reduce penile deformity and increase penile length [23,24].

In the reported studies involving people of African origin, oral vitamin E, oral tamoxifen , intra muscular triamcinolone and intralesional injection of collagenase clostridium histolyticum had been described [12,13,20]. Oral vitamin E and tamoxifen are not recommended as means of significantly reducing penile curvatures or plaque size [24].

Delay K, et al. [20] found variation in response to intralesional collagenase clostridium histolyticum injection in African Americans compared to Caucasians with African American men experiencing an average curvature improvement of 9.0 ± 6.52 compared to 16.3 ± 13.2 (p = 0.066) in Caucasians. There was no significant difference in the outcomes as related to international index of erectile function (IIEF) values both before and after treatment, penile length, or penile circumference [20].

Surgery for Peylonie's disease is reserved for cases with stable curvatures or plaques of 12 months' duration or longer [23]. Surgery modalities include plication/corporoplasty, incision and grafting using autografts such as dermis [26], fascia lata [27], rectus sheath tissue [28], temporalis fascia [29] buccal mucosa [30], tunica albuginea [31], or vein graft [32]. Allografts such as cardaveric pericardium, cardeveric fascia lata, cadaveric dura matter [33], cardeveric dermis -Tutoplast™ or xenografts (bovine pericardium, SIS™ (porcine small intestinal submucosa, porcine dermis) [34] can be used for grafting. Synthetic grafts (Gore-Tex™, Dacron™ and Tachosil™ [35–37] can also be used. In the setting of erectile dysfunction placement of a penile implant with additional procedures as may be required is performed [23,24].

The reported surgical correction in people of African origin involved plaque incision and the use of dermal grafts with good success [12] (Figure 2).

Conclusion

There is paucity of studies on Peyronie's disease that reference people of African origin. Existing cross-sectional studies does not seem to reveal any difference in the percentage prevalence of Peyronie's disease in people of Black African origin compared to Caucasians. The aetiology, clinical presentation and treatment outcomes appear similar to people of other races. One study however reported less response to intralesional injection of collagenase clostridium histolyticum in people of African ancestry.

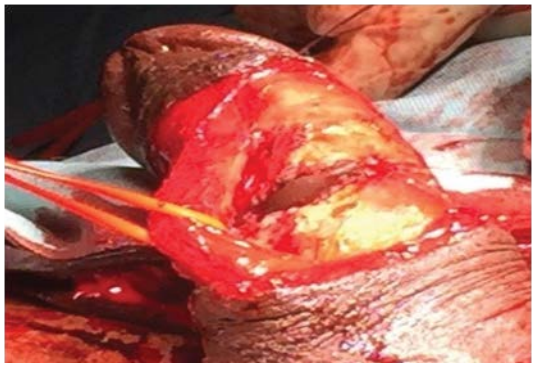

Figure 2: Surgical management of ventral penile curvature that involved mobilization of the urethral and the nerve bundles, superficial excision of plaque, incision and use of dermal graft.

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Conflict of Interest

No conflict of interest to be declared.

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