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ORIGINAL ARTICLE
The association between Peyronie's and Dupuytren's disease

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Peyronie's disease (PD) is known to be associated with Dupuytren's disease (DD) since 1828. The aim of this study was to investigate the coexistence of DD in a consecutive series of patients with PD and their clinical characteristics. From January 1988 to December 2009 all patients, presenting at our outpatient urological clinic, with PD were also examined for DD. The sample consisted of 415 male subjects with PD, 89 (22.1%) also had DD. A total of 28 men (6.7%) reported to have one or more first or second degree relatives with DD.
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Introduction

Peyronie's disease (PD) is a localized, connective tissue disorder characterized by the formation of fibrous tissue plaques within the tunica albuginea of the penis, causing a penile deformity, and a subsequent degree of erectile dysfunction and penile pain. Although its etiology has not been elucidated, PD probably results from the presence of a predisposing genetic susceptibility combined with a trauma to the erect penis.[1,2] PD appears to be more common in northern European Caucasians; its uncommon in African-American men and very rare in Asians.[3] Diabetes mellitus also seem to be a potential risk factor for PD.[4]

The very first cross-sectional study giving the proposed incidence and prevalence rates of PD was published in 1991 by investigators from Minnesota, USA.[5] The reported prevalence rate of 0.38% was consistent with earlier reports. It was estimated that there were more than 423 000 men with PD in the USA at that time and that 32 000 new cases occurred annually. Mean patient age at diagnosis was 53 years (range 19–83). The first PD prevalence rates to be reported in a European cross-sectional study came from Germany. In a survey of 4432 men (aged 30–80 years) in Cologne, 3.2% reported a palpable plaque in the penis.[4] It is now believed that the actual prevalence rate may be closer to 8% or higher.[6] The true prevalence rate of PD may be even higher than that of Dupuytren's disease (DD) because men are likely to underreport a condition that causes embarrassment.

The association between PD and DD was first recognized in 1828 and reported by Abernathy.[7] According to the literature there is a 3–15% chance that a man with DD will have PD.[8–10] DD is a fibroproliferative condition of the palmar fascias in the hand, typically resulting in progressive contracture of one or more fingers.[11] DD is thought to be the most common hereditary connective tissue disorder in Caucasians.[12] The prevalence of DD in different geographical locations is extremely variable (0.2–56%), and its not clear whether this is genetic, environmental or a combination of both. Population structure, the prevalence of associated diseases and the diagnostic criteria of DD, makes the understanding of epidemiology quite difficult.[13] The literature concerning coexisting DD in patients presenting with PD shows wide ranges varying from 0.01 to 58.8%.[5,9,14–24]

The aim of this study is to investigate the coexistence of DD in a consecutive series of patients with PD and their clinical characteristics, presenting at the outpatient urological clinic of the University Medical Centre Groningen, The Netherlands.

Patients and methods

From January 1988 to December 2009 all patients presenting with PD were examined on DD by one of

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the investigators (MFvD). The investigator checked both hands for nodules and finger contractures. The diagnosis PD was made by history and examination, that is, the presence of a palpable plaque in the penis. The investigator measured the size of the plaque using a ruler and noted the size, together with the location of the plaque, in the patients' chart. The direction and severity of the curvature were based on homemade photographs. All patients were asked for the presence of pain, a decreased rigidity and problems with intercourse. The patients were also asked for a positive family history for PD and DD.

Results

The sample consisted of 415 Caucasian male subjects with PD. The mean age of the patients was 60 ± 12 years and the mean duration of the disease was 18 ± 29 months. A total of 252 patients (60.7%) were referred by their general practitioner, 99 (24.0%) by another urologist and 30 (7.2%) by other medical specialties. A total of 89 of the patients (22.1%) also had DD. In 13 patients (3.1%) there was no information about the presence of DD (Table 1).

A total of 28 patients (6.7%) reported to have one or more close relatives (mother, father, brother, sister or grandmother) with DD. Five patients reported to have a father and two patients reported to have a brother with PD.

At the first visit 171 patients (44.9%) experienced a decreased rigidity at erection and 124 patients (34.1%) had pain during erection. A dorsal curvature was present in 238 patients (57.3%) and a ventral curvature in 31 patients (7.5%). There was a problem with intromission of the penis in the vagina in 214 patients (59.6%), problems with coital-movements occurred in 118 patients (33.3%) and 53 (16.8%) of the partners experienced pain during intercourse.

In all 93 patients (22.4%) underwent surgery; a penoplication according to Nesbitt ($n=88$) or plaque excision or incision with grafting ($n=5$). Twelve patients (12.9%) reported a complication or an uneventful outcome; erectile dysfunction ($n=3$), curvature recurrence ($n=3$), wound infection ($n=2$), paraphimosis ($n=1$), urethral stricture due to circumcision ($n=1$), skin surplus after circumcision ($n=1$) and anorgasmia ($n=1$).

Table 1 Clinical characteristics of the study population (415 men)

	N *(%), mean ± s.d.*
Age	60 ± 12
Duration of PD (months)	18 ± 29
Coexistence of DD	89 (22.1%)
Referral	
General practitioner	252 (60.7%)
Urologist	99 (24.0%)
Other	30 (7.2%)
Unknown	34 (8.2%)
Curvature	
Dorsal	149 (35.9%)
Dorsal left	67 (16.1%)
Dorsal right	22 (5.3%)
Ventral	18 (4.3%)
Ventral left	11 (2.7%)
Ventral right	2 (0.5%)
Left	60 (14.5%)
Right	13 (3.1%)
Left and right	1 (0.2%)
None	9 (2.2%)
Unknown	63 (15.2%)
Stable relationship	319 (89.4%)
Partner experienced pain during intercourse	53 (16.8%)
Pain in erection	124 (34.1%)
Decreased rigidity	171 (44.9%)
Intromission problems	214 (59.6%)
Problems coital movements	118 (33.3%)
Shortening of penis	73 (21.7%)
Operation	93 (22.4%)
Penoplication according to Nesbitt	88 (21.2%)
Plaque excision or incision with grafting	5 (1.2%)
Complications	12 (12.9%)
Curvature recurrence	3 (25%)
Decreased rigidity	3 (25%)
Wound infection	2 (16.7%)
Paraphimosis	1 (8.3%)
Urethral stricture due to circumcision	1 (8.3%)
Skin surplus after circumcision	1 (8.3%)
Anorgasmia	1 (8.3%)
Family with DD	28 (6.7%)
Father	12 (2.9%)
Mother	13 (3.1%)
Brother	5 (1.2%)
Sister	3 (0.7%)
Grandmother	4 (1.0%)
Grandfather	0 (0%)
Family with PD	7 (1.4%)
Brother	2 (0.5%)
Father	5 (1.2%)

Abbreviations: DD, Dupuytren's disease; PD, Peyronie's disease.

Discussion

In order to evaluate the coexistence of DD in patients with PD, 415 consecutive patients were examined. This study is the largest series, which examined the coexistence of DD in patients with PD. In 22% both diseases were present. Previous reports concerning coexisting DD in patients presenting with PD show ranges varying from 0.01 to 58.8%, a positive family history for PD in 1–4% and a positive family history for DD in 9.8% (Table 2).[5,9,14–24] The series from the UK, Italy, Australia and Serbia show the highest percentage of PD patients with coexisting DD.[9,15,17,19,24] The two reports focusing on PD patients <40 years show a lower percentage of coexisting DD.[21,23] Only Williams and Thomas[15]

Table 2 Studies on Dupuytren's disease in patients with Peyronie's disease

Authors	*Country*	*Year*	*Number of patients*	*Plus DD*	*Positive family history for PD*	*Positive family history for DD*
Smith[14]	USA	1966	26 (dead)	2 (7.7%)	—	—
Williams and Thomas[15]	UK	1968	17	10 (58.8%)	—	—
Chilton *et al.*[16]	UK	1982	408	63 (15.4%)	8 (1.9%)	—
Lindsay *et al.*[5]	USA	1991	101	4 (4%)	—	—
Ralph *et al.*[9]	UK	1997	51	15 (34%)	—	—
Carrieri *et al.*[17]	Italy	1998	134	28 (21%)	6 (4%)	—
Perimenis *et al.*[18]	Greece	2001	134	3 (2.2%)	—	—
Johnson *et al.*[19]	Australia	2002	294	73 (25%)	—	—
Kadioglu *et al.*[20]	Turkey	2002	307	3 (0.01%)	3 (1%)	—
Levine *et al.*[21]	USA	2003	30, <40 years	1 (3%)	—	—
Bjecic *et al.*[22]	Serbia	2006	82	32 (39%)	—	8 (9.8%)
Deveci *et al.*[23]	USA	2007	296 over all	11 (3.7%)	—	—
			32, <40 years	0		
			264, >40 years	11 (4.2%)		
Rhoden *et al.*[24]	Brazil	2010	83	5 (6%)	—	—
This series	Netherlands	2010	415	89 (22.1%)	7 (1.4%)	28 (6.7%)

Abbreviations: DD, Dupuytren's disease; PD, Peyronie's disease.

specified their method of finding DD in PD patients. Twenty-five had a follow-up period of 2 months up to 13 years. Seventeen of them were examined particularly for 'Dupuytren's contracture' in view of the known incidence with PD. Eventually, DD was diagnosed in 10 patients.

The wide variation of patients with PD having coexisting DD may have several reasons. First, the gene expression profiles of DD and PD may differ throughout the world. Second, in some articles the authors clearly discuss about 'Dupuytren's contracture' and not about DD. Patients with discrete nodules in their hands may not be diagnosed as DD and one may presume that not in all series patients have been examined by an experienced clinician. The third explanation for the wide spread may be the examination of different age groups, because the risk of acquiring PD as well as DD increases with advancing age. A Turkish study showed that out of 231 men with PD, only 8.2% presented under the age of 40.[25] A comparable percentage (9.9%) was also observed in the Minnesota study.[5]

Hindocha *et al.* report a mean age of onset in familial DD of 49 years and 55 in non-familial DD.[13] This may explain the very low percentage of coexisting DD in the study by Levine *et al.*[21] Finally, the varying or unknown follow-up periods in the different studies may explain the wide ranges of coexisting DD in PD.

In 1982, Nyberg *et al.*[10] documented the familial transmission of PD as an autosomal dominant trait in three pedigrees. The occurrence of DD in seven of their nine (78%) affected individuals, which was a significant increase over the average 0% reported in sporadic cases, suggested that both of these fibrosing disorders should be pleiotropic effects of the same genes in these families. Similarly, the histocompatibility B7 cross-reacting antigens were present in 90% of their PD patients.

Ziegelbaum *et al.*[26] reported on identical twins with PD and the HLA-B40 antigen. Family studies were also undertaken by Bias *et al.*[27] when three patients reported similarly affected first-degree relatives. One kindred showed father-to-son transmission of PD with DD in three generations. Pedigree analysis of the three families suggested that PD also is a male-limited, autosomal dominant trait. Antigens of the HLA-B7 cross-reacting group occurred in all three kindreds; however, the data ruled out close linkage of the disease and HLA.

Conclusions

DD is thought to be the most common hereditary connective tissue disorder in Caucasians. However, the true prevalence rate of PD may be even higher than that of DD due to the fact that men are likely to underreport a condition that causes embarrassment. This single-center study in Dutch PD patients showed coexisting DD in 20%. Given the increased recognition of PD, as well as the emerging treatment, which is currently being used for DD and may become approved worldwide for PD (collagenase), the association between these two disorders will gain greater importance.

Conflict of interest

The authors declare no conflict of interest.

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