The effect of Renal Transplantation and Hemodialysis on Erectile Dysfunction

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in Dermatology and Andrology

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Abstract

Aim: Detection of the effect of hemodialysis and renal transplantation on erectile function.

Patients and methods: 48 patients on hemodialysis and 30 renal transplant recipients were assessed using IIEF-5 before and one year after hemodialysis and transplantation. Erectile dysfunction was compared in these two groups.

Results: ED was improved in hemodialysis patients and renal transplant recipients; however the renal transplant patients in comparison with hemodialysis group reported a better improvement in erectile function.

Correlation between age and IIEF-5 score before & after hemodialysis and renal transplantation showed statistically significant difference.

Coclusion: Erectile dysfunction improvement seems be higher when the kidney transplantation is performed at lower ages.

Key words: Erectile dysfunction, End stage renal disease, hemodialysis, Renal transplantation

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Introduction

Erectile dysfunction (ED) is defined by the National Institute of Health (NIH) Consensus Development Conference as the consistent inability to achieve or maintain an erection sufficient for satisfactory sexual performance ***(NH, 1993)***.

Erectile dysfunction (ED) is a major health issue in modern life and is often underdiagnosed and underestimated due to the patient's embarrassment and the physician's unawareness about its high prevalence and impact on the quality of life***.(Rosas et al., 2003*)**.

The prevalence of ED in 40- to70-year-old men was about 52% in Massachusetts Male Aging Study ***(Feldman HA et al., 1994).*** Although it is a benign disorder, ED is related to physical and psychosocial health, and it has a significant impact on the quality of life (QoL) of both sufferers and their partners ***(Wespes et al., 2006).***

The international index of erectile dysfunction (IIEF), developed by Rosen et al.(1997) has an excellent reliabity and sensevity for assessing male ED. It consists of five domains and 15 items questionnaire. Afive items- version of IIEF (IIEF-5) was developed to diagnose the presence and severity of ED. ***(Rosen et al., 1999***) and this version has been translated to Arabic as being as suitable as the original IIEF ***(Shamloul et al., 2004)***.

The presence of various conditions affects erectile function. ED is significantly correlated with age, and many diseases, including hypertention, diabetes mellitus, heart diseases, chronic renal disease and neurological disease could also be in the etiological background of ED ***(lue et al., 2000).***

End-stage renal disease (ESRD) is a chronic illness frequently associated with ED; the prevalence of ED is high in patients undergoing both chronic hemodialysis (HD) and renal transplantation (RT) ***(Malavaud et al., 2000 Lasaponara et al., 2004 ; ; Kleinclauss et al., 2005).***

The prevalence of ED in hemodialysis patients is reported to be up to 82%. ***(Kleinclauss et al., 2005)***. Higher age, longer time on HD prior to RT, higher comorbidity, diabetes mellitus, medications, and a prior RT are variables associated with ED in renal transplant recipients (RTRs). ***(Rebollo P et al., 2003)***. In addition, psychological and physical stresses are also commonly present in this setting ***(Procci et al., 1981; Toorians et al., 1997; Anantharaman et al., 2007)*** .RT appears to have very variable effects on ED. After RT, EF has been reported to improve in 75% of patients; conversely ED may persist in 20% to 50% of patients. ***(Malavaud B et al., 2000).*** The aetiology of ED in patients with ESRD and in RTRs is multifactorial; factors include uraemia, hypertension, endocrine factors, and nonorganic factors like depression. ***(Kleinclauss et al., 2005).).*** Some causes of ED in hemodialysed patients are partially corrected by RT, but other factors can subsequently be involved, such as immunosuppressive drugs or vascular conditions ***(Lasaponara F et al., 2004 ; Malavaud et al., 2005)***. The increased number of kidney transplants being performed in addition to the improved graft and patient survival rates has resulted in a greater number of patients with ED. Thus, there is an increasing number of men experiencing a major quality offline issue***. (Morgentaler et al., 1999).***

Aim of the work

The aim of this work is to evaluate erectile functions of hemodialysis patients and renal transplant recipients.

ANATOMY OF Penis

ANATOMY OF ERECTION

Gross Anatomy

The penis is a specialized vascular organ composed of three bodies of erectile tissue, the corpus spongiosum, encompassing the urethra and terminating in the glans penis, and the two corpora cavernosa that function as blood filled capacitors, providing structure to the erect organ (***Melman et al., 1994).***

Three spongy cylinders comprise the human penis; the paired corpora cavernosa runs dorsolaterally and the corpus spongiosum runs ventrally. Incomplete septa between the corpora cavernosa allow for neurovascular communication, allowing the two bodies to function physiologically and pharmacologically as a single unit. The three corporal bodies are enveloped by a dense fascial structure known as the tunica albuginea. The deep fascia (Buck's fascia) of the penis surrounds the outside of the tunica albuginea and gives off a thin fibrous septum that separates the corpora cavernosa from the corpus spongiosum. Buck's fascia is attached to the perineal membrane proximally; distally, it is tightly attached to the base of glans penis at the coronal sulcus, where it fuses with the end of the corpora. The fascia has a dense structure and is composed of fibers that run longitudinally. It is firmly attached to underlying tunica albuginea and surrounds the deep dorsal vein and the paired dorsal arteries and nerves (Fig. 1) .

Surrounding the deep penile fascia is the superficial (Colles') fascia, which is continuous with Scarpa's fascia of the lower abdominal wall and with dartos fascia of the scrotum This fascia is surrounded by skin. The fundiform ligament is the thickening of Colles' fascia, which continues to join the linea Alba and splits to surround the body of the penis and then fuses with the septa of the scrotum. Deep to Colles' fascia is the triangular suspensory ligament, which is in continuity with Buck's fascia; its attachment to the pubic bone maintains penile position during erection ***(Hsu et al., 1994).*** (Fig. 2).

The proximal penis is anchored to the inferior pubic rami and consists of the crura ofthe corpora cavernosa. The bulbospongiosus muscle surrounds the penile bulb supplied by the deep branch of the perineal nerve). The ischiocavernosus muscles (supplied by the perineal branch of the pudendal nerve) cover the penile crura and proximal part of the penile shaft. These skeletal muscles lie between Colles' and Buck's fascia. The glans penis appears to be sponge like because of a rich venous plexus. It has no fibrous sheath, and it is covered with very thin and firmly adherent skin. ***(Hsu 2006).***

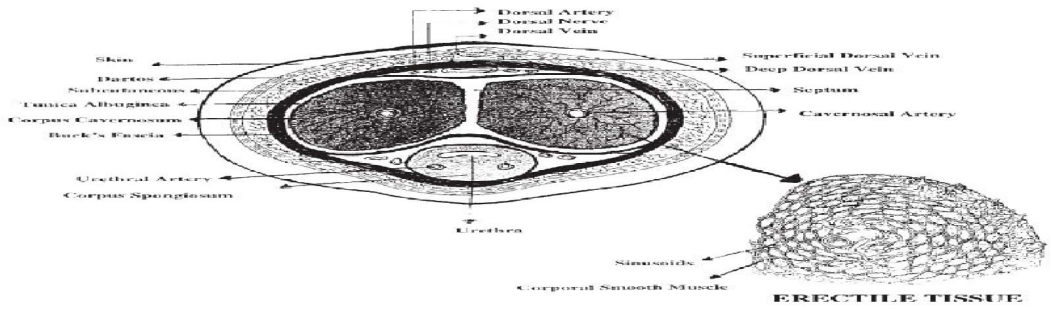

Fig.1. Schematic representation of a cross-section of the human penis. ***(Mulcahy et al., 1997***)
ton of the penis. ***(Lue et al., 1998)***

Tunica Albuginea and Fibrous Skeleton of the Penis

The tunica albuginea is composed of elastic fibers forming a tough irregular lattice that is predominantly collagenous (both types I and III), although the detailed histological composition depends on its anatomical location and function. In the flaccid state, its average thickness is 2 to 3 mm. The tunica albuginea becomes much thicker ventrally, where it forms the groove to accommodate the corpus spongiosum. Surrounding the corpora cavernosa, the tunica is a bilayered structure. The inner layer is composed of circularly oriented bundles that support and contain the cavernous tissue. Intracavernosal pillars radiate from the inner layer into the corpora and act as struts to support the erectile tissue. The outer layer is oriented longitudinally, extending from the glans penis to the proximal crura, ultimately inserting on the inferior pubic the circular fibers alone provide the support. The tunica albuginea of the corpus spongiosum is much thinner than that of the corpora cavernosa and contains more elastic fibers over the urethra, which explains the epidemiology of perforation during penile prosthesis implantation. Emissary veins run between the inner and outer bundles obliquely and, therefore, can be occluded easily by the shearing action of the tunical layers during erection. The outer layer appears to play an additional role in compression of the veins during erection. However, dorsal artery branches take a more direct perpendicular route and are protected by compression during erection by a peri-arterial fibrous sheath. The tunica albuginea provides tough uniform backing for engorged sinusoidal spaces. ***(Hsu et al., 1994).***