

## Erectile Dysfunction in Young Men—A Review of the Prevalence and Risk Factors



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### ABSTRACT

**Introduction:** Erectile dysfunction (ED) is an important health concern that can significantly affect a man's psychosocial well-being. ED has traditionally been considered a disease of old age; however, contemporary evidence suggests a growing incidence of ED in men younger than 40 years. The process of achieving an erection is multifaceted; there are many potential mechanisms that can be disrupted. It is critical to identify the specific causes of ED before proceeding with potentially costly and invasive therapeutic options. Advances in diagnostic and treatment modalities offer opportunities to identify and manage young men with ED.

**Aim:** To provide an update on the prevalence and risk factors of ED in young men and to provide a framework to guide clinicians in identifying and managing the affected young man.

**Methods:** Comprehensive review of the literature pertaining to ED in young men.

**Main Outcome Measures:** ED in young men was assessed by outlining the prevalence according to recent epidemiologic studies. The pathophysiology, diagnostic considerations, risk factors, and etiologies were reviewed.

**Results:** Large multinational studies have estimated the prevalence of ED in young men to be as high as 30%. Several studies have stratified the etiologies of ED into psychogenic and organic causes. Psychogenic etiologies of ED include depression, anxiety, and partner-related difficulties. These patients tend to experience sudden onset of symptoms, with decreased libido and good quality of spontaneous or self-stimulated erections. Organic etiologies include vasculogenic, endocrinologic, neurogenic, iatrogenic, and structural components. These patients usually experience gradual onset of symptoms and a low to normal libido. Conservative treatments such as phosphodiesterase type 5 inhibitors continue to be the mainstay treatment.

**Conclusions:** ED in young men is an increasingly common condition. A careful diagnostic evaluation should focus on the identification of any underlying etiology to ensure appropriate management of patients. **Nguyen HMT, Gabrielson AT, Hellstrom WJG. Erectile Dysfunction in Young Men—A Review of the Prevalence and Risk Factors. Sex Med Rev 2017;5:508–520.**

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**Key Words:** Erectile Dysfunction; Young Men; Risk Factors; Prevalence; Treatment

### INTRODUCTION

Erectile dysfunction (ED), as defined by the International Consultation on Sexual Medicine, is the consistent and recurrent inability to acquire or sustain an erection of sufficient rigidity and duration to engage in satisfactory sexual intercourse.<sup>1</sup> Despite the relatively high prevalence of ED, our knowledge of this condition had remained limited until the 1970s. Since that time, advances in molecular biology techniques have drastically improved our understanding of penile physiology and the pathophysiology

underlying ED.<sup>2–4</sup> The process of achieving an erection involves coordination among psychological, neurological, and vascular pathways, which combine to facilitate a physiologic response in the penile vasculature. In response to parasympathetic signaling received from the pudendal and pelvic splanchnic nerve plexuses, the penile cavernosal tissue releases nitric oxide (NO). NO induces relaxation of cavernosal smooth muscle through a cyclic guanosine monophosphate–mediated decrease in intracellular calcium. Filling of the cavernosal sinusoids obstructs venous outflow from the penis by compression of the veins against the tunica albuginea, allowing for maintenance of an erection. The transient increase in cyclic guanosine monophosphate is terminated by phosphodiesterase type 5 (PDE5). Detumescence is achieved by adrenergic receptor activation, which leads to rhythmic contraction of the cavernosal smooth muscle, promoting a decrease in arterial diameter and thereby inducing

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venous outflow.<sup>2–4</sup> Given the complexity with which the psychological and physiologic pathways intersect, there are myriad ways in which they can become disrupted and cause ED in young men.

Historically, ED has been considered an age-dependent disease, with most men developing signs and symptoms of ED after 65 years of age. However, recent studies have demonstrated an increasing incidence of ED in men younger than 40 years, and this trend is likely underestimated because of under-reporting by younger patients.<sup>5</sup> Until the 1970s, ED in men younger than 40 years was believed to be primarily of psychogenic origin. As such, diagnostic evaluation of young men with ED before the 1970s consisted almost exclusively of obtaining a psychosexual history and offering treatments limited to behavioral therapy and herbal supplementation.<sup>6</sup> Recent studies, which will be outlined further in the following sections of this review, have reported that as many as 87% of young men with ED also have an organic (vascular, neurologic, hormonal, fibroproliferative, or medication-induced) component to their condition.<sup>7</sup>

ED is an important health concern that significantly affects quality of life and can have a detrimental effect on a man's psychosocial well-being. ED is one of the few disorders that will motivate young men to see an urologist; as such, there is a need for increased awareness among practitioners. Although advances in screening (ie, penile duplex ultrasound, endocrine evaluation, etc) and treatment (ie, oral pharmacotherapy, intracavernosal injection [ICI] therapy, and penile prosthesis) have improved ED detection and management, it is not uncommon for young men with sexual dysfunction to be dismissed without a proper workup for non-psychogenic etiologies.

The goal of this review is to provide an update on available data regarding psychogenic and organic disorders associated with ED in young men. The authors also aim to provide a framework to guide clinicians in identifying young men with ED and improving the management of this growing patient population.

## EPIDEMIOLOGY

The reported prevalence of ED in the general population has been highly variable because of differences in ED criteria, population selection, and modalities used to measure erectile function. It has been well described in the literature that the prevalence of ED is positively correlated with age, with 52% of men 40 to 70 years old with some degree of ED.<sup>8</sup> One American cross-sectional study found a fourfold increase in the prevalence of ED in men in their 70s compared with men in their 20s.<sup>8</sup> These findings are consistent with another multinational study involving 27,839 men in eight countries that demonstrated the prevalence of ED in men in their 70s to be 37% compared with 11% in men in their 30s and 8% in men in their 20s.<sup>9</sup> One age-stratified study conducted on 948 Turkish men with an five-item International Index of Erectile Function score lower than 21 used psychiatric evaluation, nocturnal penile tumescence with

the RigiScan, and penile Doppler ultrasound to determine the etiology of ED. The investigators stratified patients based on whether they were older or younger than 40 years. It found that 85.2% of the 526 men younger than 40 years had psychogenic ED as the primary etiology compared with 14.8% exhibiting an organic cause of their ED (arteriogenic, venogenic, neurogenic, endocrinologic, drug-induced, or mixed). This is in stark contrast to the group of patients older than 40 years, which presented a 40.7% prevalence of psychogenic ED and a 59.3% prevalence of organic ED.<sup>10</sup>

Interestingly, another retrospective study conducted at the University of California—San Francisco found that only 13% of men younger than 40 years (N = 100) had exclusively psychogenic ED.<sup>7</sup> The seemingly contradictory findings from these studies might be reconciled by differences in the classification of pure vs mixed etiologies of ED. Researchers in Florence reported that the percentage of men younger than 40 years consulting for ED in their clinic had increased from 5% in 2010 to more than 15% in 2015.<sup>11</sup> Another population-based study was conducted in Switzerland with more than 2,500 young men 18 to 25 years old. Participants completed a sexual function survey while undergoing medical screening for the military. This study found that as many as 30% of participants had varying degrees of ED.<sup>12</sup> When taken together, studies support the notion that ED is increasingly becoming a common concern in young men, and as such, it is important to improve awareness and appropriate screening by clinicians.

## PATHOPHYSIOLOGY AND DIAGNOSIS

The pathogenesis of ED is often multifactorial, involving interplay between physiologic and psychological stimuli. The International Society for Sexual Medicine (ISSM) stratifies the mechanisms underlying ED into two major components: organic and psychogenic. Patients with psychogenic ED tend to experience sudden onset of symptoms, with decreased libido and good quality spontaneous or self-stimulated erections. In contrast, organic ED is often associated with a gradual onset of symptoms and a normal libido.<sup>13</sup> However, it is important to note that organic and psychogenic subdivisions merely represent a spectrum of disease. The etiology of ED in young men is often multifactorial, involving psychogenic and organic components (Table 1).

The organic component can be further subdivided into vasculogenic, endocrinologic, neurogenic, and structural etiologies. Patients most often develop vasculogenic ED as a consequence of generalized atherosclerosis.<sup>14</sup> Advanced atherosclerotic disease can occlude the arterial vasculature supplying the corpora cavernosa, thereby decreasing perfusion pressure and ultimately decreasing erectile rigidity. Likewise, inadequate venous occlusion from trauma, aging, anxiety, or fibroelastic changes in the penis can contribute to poor erectile function.<sup>15,16</sup> A patient with suspected vasculogenic ED can be evaluated for arterial inflow, blood retention, and venous outflow using ICI and stimulation, penile duplex Doppler ultrasonography, or penile angiography.

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