

ERECTILE DYSFUNCTION

Do Urologists Really Recognize the Association Between Erectile Dysfunction and Cardiovascular Disease?



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ABSTRACT

Introduction: Erectile dysfunction (ED) and cardiovascular diseases (CVDs) share many common risk factors. ED could be a strong independent predictive factor of CVDs. Furthermore, the treatment of ED had been shown to be beneficial for cardiovascular diseases. However, the association between ED and CVDs has been reported scarcely in the literature.

Aim: To investigate urologists' perception, diagnosis, and treatment of CVDs in patients with ED.

Methods: The study was conducted as a prospective study from November 2018 through February 2019, including urologists aged 18–64 years. All participants completed a survey of the knowledge of ED via an online questionnaire platform in 7 WeChat groups of urologists. WeChat is the most popular multipurpose messaging and social media in China.

Main Outcome Measure: The main outcomes were the answers that urologists chose or filled.

Results: 449 urologists were included. Most of participants (375, 83.5%) agreed that CVDs are associated with ED. Only 231 participants (51.4%) thought ED was an independent disorder. The awareness of the association between ED and CVDs is significantly higher among male urologists than their female counterparts. Although 378 (83.6%) participants believed that the progression of these 2 diseases was consistent, only 181 (44.9%) would do conjoined assessment of both CVDs and ED. In addition, most urologists only considered conventional treatment, such as psychological intervention (341, 75.4%) and phosphodiesterase type 5 inhibitor (PDE5i) therapy (318, 70.4%) for their patients, whereas 339 urologists (88.3%) claimed that they would treat CVDs in patients with both ED and CVDs. 344 (76.6%) urologists showed some concerns over PDE5is.

Conclusion: Urologists' assessment of CVDs in patients with ED was disappointing especially among young and female urologists or those working in underserved areas. Besides, the urologists' treatments of ED were not updated, and their attitudes toward the safety and effectiveness of PDE5is for CVDs were not optimistic. **Li D, Li X, Peng A, et al. Do Urologists Really Recognize the Association Between Erectile Dysfunction and Cardiovascular Disease? Sex Med 2020;8:195–204.**

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Key Words: Erectile Dysfunction (ED); Cardiovascular Diseases (CVDs); Association; Urologists' Perception; Questionnaire

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INTRODUCTION

Erectile dysfunction (ED) is defined as the inability to attain or maintain a penile erection sufficient for successful vaginal intercourse. It affected 52% of men between the ages of 40 and 70 years.^{1,2} As the present Princeton I in June 1999 proposed the sexual activity of high-risk patients might cause cardiovascular risks, many studies found that cardiovascular diseases (CVDs) have been linked to the development of ED in recent years.^{1,3,4} Diabetes, hypertension, hyperlipidemia, and smoking are major risk factors for cardiac diseases, and these risk factors directly impact vascular function.³ Several studies proved that these same risk factors also apply to ED.^{5–7} The pathophysiologic basis of both ED and CVDs is vascular insufficiency such as atherosclerosis and endothelial dysfunction.^{8,9} In fact, ED had been demonstrated to occur on an average of 3 to 5 years before the cardiovascular events⁴ and could be a strong independent predictive factor of CVDs indubitably.¹⁰ The European Guidelines on cardiovascular diseases also emphasize the significance of ED as a predictor of cardiovascular diseases.¹¹ In addition, phosphodiesterase type 5 inhibitors (PDE5is) are widely known as the first-line treatment for ED. In recent years, PDE5 inhibitors are recognized to be beneficial for myocardial contractility and geometry, reducing tissue fibrosis, hypertrophy, and apoptosis.¹² Corinaldesi et al¹³ showed PDE5is could provide benefits for coronary artery disease (CAD) treatment and improve the prognosis of it.

One recent study found the urologist played an important role in the management of ED in patients with a history of cardiovascular events.¹⁴ However, no investigation focusing on urologists' cognitive levels of the association between ED and CVDs was reported before. Herein, we conduct this questionnaire survey to assess the cognitive levels of the association between ED and CVDs among urologists in China so as to improve their awareness of the underlying correlation.

MATERIALS AND METHODS

Our questionnaire-based prospective study from November 2018 to February 2019 was performed through an online survey. This study was authorized by the Institutional Review Board of Xiangya Hospital (2019-S252).

We sent an anonymous electronic survey through the Questionnaire Star (<https://www.wjx.cn/>) to several urologist groups on the WeChat platform. WeChat, which was developed by Tencent Inc, is a multipurpose messaging and social media in China. The Questionnaire Star, the most popular application for spreading questionnaires in China, provided considerable convenience in procuring data.

Our questionnaire had been viewed 661 times and received 449 effective replies (61.27%) which were from different levels of hospitals in 23 provinces of China and 2 of which were from overseas. The participants took action voluntarily anonymously. The survey consisted of 22 questions to assess the perception of the association

between ED and cardiovascular diseases by urologists and was divided into 4 sections: (i) demographic information, (ii) theoretical cognition of ED and cardiovascular diseases, (iii) diagnosis of ED and cardiovascular diseases, and (iv) treatment of ED and cardiovascular diseases. Participants requiring to fill in an answer for question 1 and 3 could choose one or more answers to question 12, 14, 16, and 21 and were required to choose one appropriate answer for the other questions. On question 8, only participants who choose "yes" were required to answer questions 9 and 10, otherwise moving to question 12 if choosing no.

Continuous data were presented as mean and analyzed by analysis of variance. Quantitative data were analyzed using SPSS Statistics (IBM, version 22.0; SPSS, Armonk, NY, USA) by χ^2 tests to compare responses between different participant groups.

RESULTS

Overview of Survey

Participants' baseline characteristics of the study population are shown in Table 1. 449 participants from China ranging from 18 to 64 years of age completed our survey, including 341 men (75.9%) and 108 women (24.1%). In a total of 449 participants, 370 of them were urologists, while 79 of them were andrologists. 378 of 449 (84.2%) participants were younger than 40 years. Most participants (411 of 449, 91.5%) were in practice for less than 20 years. The numbers of participants with associate degree, bachelor's degree, postgraduate degree, and doctoral degree were 39 (8.7%), 249 (55.5%), 110 (24.5%), and 51 (11.3%), respectively. The numbers of participants with differing professional titles and from different

Table 1. Characteristics of urologists in survey

Characteristics	Number	Percentage
Age (years old)		
≤40	378	84.2%
>40	71	15.8%
Gender		
Male	341	75.9%
Female	108	24.1%
Professional years (years)		
≤20	411	91.5%
>20	38	8.5%
Educational backgrounds		
Under bachelor's degree	39	8.7%
Bachelor's degree	249	55.5%
Postgraduate degree	110	24.5%
Doctoral degree	51	11.3%
Level of hospital		
Community hospital	72	16.0%
Secondary hospital	119	26.5%
Tertiary hospital	258	57.5%
Weather an andrologist		
Andrologists	79	17.6%
Nonandrologists	370	82.4%

Table 2. Urologists' theoretical cognition of ED in different groups

Characteristics	Whether ED is a natural aging process		Whether to classify ED		Whether CVD was associated with ED	
	Yes (n = 196)	No (n = 207)	Yes (n = 374)	No (n = 29)	Yes (n = 339)	No (n = 64)
Age (years old)						
≤40	<i>P</i> = .261		<i>P</i> = .500		<i>P</i> = .543	
>40						
Gender						
Male	<i>P</i> = .033		<i>P</i> = .002		<i>P</i> = .038	
Female						
Professional years (years)						
≤20	<i>P</i> = 1.000		<i>P</i> = .494		<i>P</i> = .816	
>20						
Educational background						
Under bachelor's degree	<i>P</i> < .001		<i>P</i> = .137		<i>P</i> = .228	
Bachelor's degree						
Postgraduate degree						
Doctoral degree						
Level of hospital						
Community hospital	<i>P</i> < .001		<i>P</i> = .357		<i>P</i> = .204	
Secondary hospital						
Tertiary hospital						

CVD = cardiovascular disease; ED = erectile dysfunction.

levels of hospitals were 72 (16.0%) in community hospitals, 119 (26.5%) in secondary hospitals, and 258 (57.5%) in tertiary hospitals (Table 1).

Urologists' Theoretical Cognition of ED in Different Groups

Of the total of 449 participants, 218 (48.6%) believed that ED was a natural phenomenon during the aging process, and 231 (51.4%) thought ED was a disorder. More participants with higher education and in higher levels of hospitals perceive that ED was a disease ($P = .001$, $P < .001$) (see Table 2). Regarding the classification of ED, a small number of the urologists (30, 6.7%) chose not to classify it. For the remaining 419 urologists, the numbers of participants who chose psychogenic, organic, and mixed were 173 (38.5%), 70 (15.6%), and 176 (39.2%), respectively. Most participants (375, 83.5%) agreed that CVDs were associated with ED. Among these 375 participants, the considerations of the most important association between ED and CVDs range from common risk factors (149/375, 39.7%), relative or similar mechanisms (153/375, 40.8%), common manifestations (27/375, 7.2%), common therapeutic method or drugs (36/375, 9.6%), and other factors (10/375 2.7%) (Figure 1A). As for the clinical significance about the relationship between ED and CVDs, Figure 1B shows that most participants believed the most important aspect was in diagnosis (176/375, 47.0%) and treatment (146/375, 39.0%), a few thought it was valuable for prognosis (42/375, 11.2%) and otherwise helpful (11/375, 3.0%). The urologists who deemed that CVDs were

associated with ED were more likely to inquire patients with ED about CVDs ($P < .001$), treat CVDs in patients with both ED and CVDs ($P < .001$), and focus on CVD development in the follow-up of patients with ED ($P < .001$) (Table 2). Moreover, the number of participants who hold the opinion that ED was not a natural phenomenon because of aging ($P = .033$), there is a need to classify ED accordingly ($P = .002$), and CVDs associated with ED ($P = .038$) were all significantly higher in male urologists than in female urologists (see Table 2).

Urologists' Diagnosis of ED and CVDs in Patients with ED

As to whether it is necessary to strictly follow the protocol when diagnosing ED, most participants (383, 85.3%) chose "yes" (Table 3). A few participants agreed that there is no need to do any examination for patients with ED (62, 13.8%). Among the remaining 387 participants, participants choosing physical examination, sex hormone level examination, examination of blood lipid and blood sugar, evaluation using International Index of Erectile Function-5 (IIEF-5), some special examination, and other examination were 287 (74.2%), 321 (83.0%), 271 (70.0%), 226 (58.4%), 255 (65.9%), and 70 (18.4%), respectively. A total of 396 (88.2%) participants would inquire patients about cardiovascular disease in patients with ED, and most urologists (324, 72.2%) believed that the progress of these 2 diseases was consistent. With regard to how to assess the risk of cardiovascular diseases in patients with ED, 113 (25.2%) participants chose not to assess, and most of them would use the

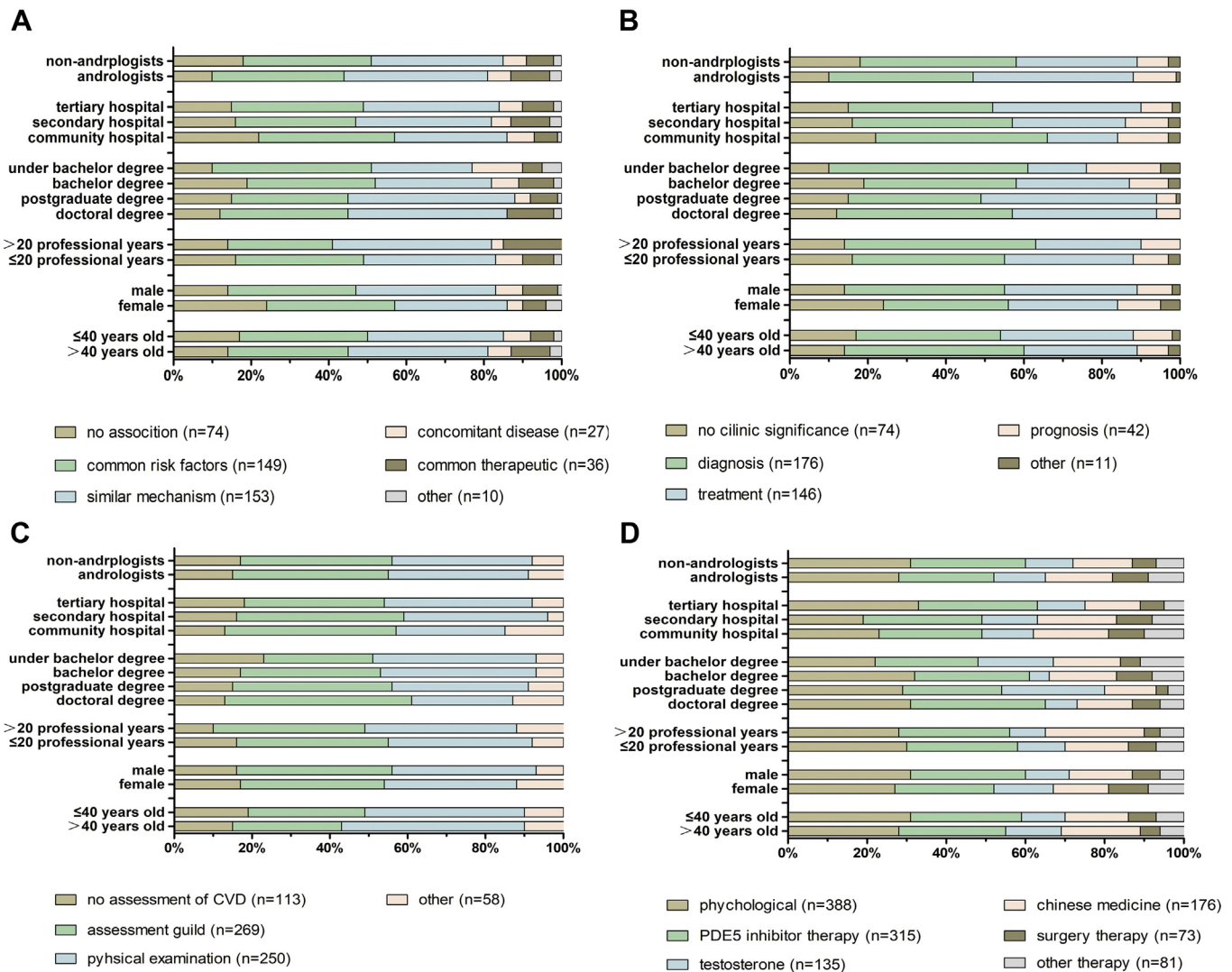


Figure 1. (A) Urologists' attitude to what is the most important association between ED and CVD. (B) Urologists' attitude to what is the most important clinical significance of the relationship between ED and CVD. (C) Urologists' attitude that how to assess the risk of cardiovascular diseases of patients with ED. (D) Urologists' attitude to how to treat ED. CVD = cardiovascular disease; ED = erectile dysfunction.

assessment guide of CVDs (269,59.9%) and do physical examinations for CVDs (250,55.7%) (Figure 1C).

Urologists' Treatment of ED and CVDs in Patients with ED

In terms of how to treat ED, most urologists in our survey considered psychological intervention (338, 75.3%) and PDE5i therapy (315, 70.2%). Only a small number of urologists treated patients with other therapies, such as testosterone therapy (135, 30.1%), traditional Chinese medicine (176, 39.2%), surgery (73, 16.3%), and other therapies (81, 18.0%) (Figure 1D). More than half of the participants (284, 63.3%) agreed that PDE5is should be taken regularly while others (165, 36.7%) thought otherwise. A total of 113 (25.2%) participants believed the PDE5i was not associated with CVDs; of those who thought there was an association with PDE5is and CVDs, 213 (47.4%)

consented that PDE5is could increase the risk for CVDs, and 123 (27.4%) hold the view that PDE5is could treat CVDs. In regard to concerns about the use of PDE5is in patients with CVDs, 120 participants did not have any concerns, while among the remaining 329 participants, most participants are worried about the safety (225, 68.3%) of PDE5is, and a few of them are concerned about the effectiveness (76, 23.1%) and other aspects (45, 13.7%). A majority of urologists (396, 88.2%) claimed that they would manage CVDs in patients with both ED and CVDs. And almost all urologists (91.1%) would include CVD changes in the follow-up of ED disease. Univariate analysis revealed that the urologists who have been in practice for more than 20 years ($P = .001$), male urologists ($P = .001$), and urologists affiliated with higher levels of the hospitals ($P = .011$) would pay more attention to manage CVDs in patients with both ED and CVDs (Table 4).

Table 3. Urologists' diagnosis of ED and CVD in patients with ED in different group

Characteristics	Whether to strictly follow process when diagnosing ED		Whether to do examination to ED patients		Whether to inquire about CVD in ED patients		Whether the progress of ED and CVD is consistent	
	Yes (n = 344)	No (n = 59)	Yes (n = 348)	No (n = 55)	Yes (n = 361)	No (n = 42)	Yes (n = 289)	No (n = 114)
Age (years old)								
≤40	<i>P</i> = .751		<i>P</i> = .871		<i>P</i> = .026		<i>P</i> = .454	
>40								
Gender								
Male	<i>P</i> = .478		<i>P</i> = .464		<i>P</i> = .837		<i>P</i> = .781	
Female								
Professional years (years)								
≤20	<i>P</i> = 1.000		<i>P</i> = .617		<i>P</i> = .155		<i>P</i> = .250	
>20								
Educational background								
Under bachelor's degree	<i>P</i> = .018		<i>P</i> = .494		<i>P</i> = .849		<i>P</i> = .160	
Bachelor's degree								
Postgraduate degree								
Doctoral degree								
Level of hospital								
Community hospital	<i>P</i> = .306		<i>P</i> = .125		<i>P</i> = .351		<i>P</i> = .114	
Secondary hospital								
Tertiary hospital								

CVD = cardiovascular disease; ED = erectile dysfunction.

The Different Attitudes to ED Between Andrology and Nonandrology in Urologists

Different attitudes to ED between andrologists and nonandrologists are shown in [table 5](#). No significant difference was observed in theoretical cognition between andrologists and nonandrologists in urologists. Both andrologists (89.9%) and nonandrologists (82.2%) were aware of the close association between ED and CVDs. In addition, above half of andrologists (53.2%) and nonandrologists (51.1%) thought ED was a disease.

[Figure 1A](#) showcased that when it comes to the most important associations between ED and CVDs, most andrologists and nonandrologists referred to shared risk factors (33.0%, 34.2%) and shared mechanisms (33.5%, 36.7%), and no significant difference was found. When considering the significance of the clinical association, most andrologists pointed to the treatment when compared with nonandrologists (40.5% vs 30.8%, *P* = .045).

Most andrologists (83.5%) and nonandrologists (85.7%) would do a detailed physical examination when receiving a patient diagnosed with both ED and CVDs. However, more andrologists chose to use the IIEF-5 scale (64.6% vs 47.3%, *P* = .005) and other special tests, such as night penile erection (67.1% vs 54.6%, *P* = .042) to evaluate patients with ED than nonandrologists. No significant difference exists in whether to inquire about cardiovascular disease in patients with ED between

andrologists and nonandrologists (89.9% vs 87.8%, *P* = .612) ([Table 5](#)).

There are no significant difference in treatments in patients with ED and CVDs between andrologists and nonandrologists, including whether to manage ED and CVDs altogether (88.4% vs 83.5%, *P* = .796), whether it was necessary to use PDE5is on patients with CVDs, and whether follow changes of both ED and CVDs (94.9% vs 90.3%, *P* = .187) (See [Table 5](#)).

DISCUSSION

The association between ED and CVDs has recently gained more and more attention. It seems that urologists who pay attention to the connection between ED and CVDs can exert a marked influence on cardiovascular health management. Our questionnaire was conducted among several urologists' groups. The Questionnaire Star, the most popular online questionnaire platform in China, not only arranges the received data but also enables a simple analysis of data. WeChat is a widely used social medium, which is described by Forbes as one of the most powerful apps.^{15,16} WeChat groups of urologists in our survey are the authority that involves a rigorous identity review, and data from them are rigorous. By analyzing the received answer sheets, we found that urologists did not pay enough attention to

Table 4. Urologists' treatment of ED in patients with both ED and CVD in different group

Characteristics	Whether to use a good life style to treat ED		Which was the treatment method of PDE5i		Whether to do penile implantation in intractable patients with ED		Whether to treat CVD in patients with both ED and CVD		Whether concerning about the use of PDE5i in patients with CVD		Whether to focus on CVD changes in the follow-up of patients with ED	
	Yes (n = 279)	No (n = 124)	On regular (n = 253)	On demand (n = 150)	Yes (n = 226)	No (n = 117)	Yes (n = 355)	No (n = 58)	Yes (n = 304)	No (n = 99)	Yes (n = 367)	No (n = 46)
Age (years old)												
≤40	<i>P</i> = 1.000		<i>P</i> = 1.000		<i>P</i> = 1.000		<i>P</i> = .055		<i>P</i> = .897		<i>P</i> = .009	
>40												
Gender												
Male	<i>P</i> = .222		<i>P</i> = .155		<i>P</i> = .706		<i>P</i> = .334		<i>P</i> = .663		<i>P</i> = .012	
Female												
Professional years (years)												
≤10	<i>P</i> = .710		<i>P</i> = 1.000		<i>P</i> = 1.000		<i>P</i> = .287		<i>P</i> = .692		<i>P</i> = .231	
>10												
Educational background												
Under bachelor's degree	<i>P</i> = .075		<i>P</i> = .507		<i>P</i> = .445		<i>P</i> = .621		<i>P</i> = .573		<i>P</i> = .101	
Bachelor's degree												
Postgraduate degree												
Doctoral degree												
Level of hospital												
Community hospital	<i>P</i> = .036		<i>P</i> = .253		<i>P</i> = .734		<i>P</i> = .032		<i>P</i> = .337		<i>P</i> = .002	
Secondary hospital												
Tertiary hospital												

CVD = cardiovascular disease; ED = erectile dysfunction; PDE5i = phosphodiesterase type 5 inhibitor.

Table 5. The different attitudes to ED between andrology and nonandrology in urologists

Characteristics	Andrologist (%) (n = 79)	Non-andrologist (%) (n = 370)	P	Total (%) (n = 449)
Regarding ED as a natural aging process rather than a disease	42 (53.2%)	189 (51.1%)	.737	231 (51.4%)
ED closely associated with CVD	71 (89.9%)	304 (82.2%)	.094	375 (83.5%)
Doing a detailed physical examination for ED patients	66 (83.5%)	317 (85.7%)	.628	383 (85.3%)
Using IIEF-5 scale for ED patients	51 (64.6%)	175 (47.3%)	.005**	226 (50.3%)
Using special tests, such as night penile erection and hardness test	53 (67.1%)	202 (54.6%)	.042	255 (56.8%)
Influence of PDE5i administration on patients with CVD				
Benefit	25 (31.6%)	98 (26.5%)	.310	123 (27.4%)
Harm	36 (45.6%)	177 (47.8%)	.409	213 (46.4%)
No influence	18 (22.8%)	95 (25.7%)	.350	113 (25.2%)
Main concern about PDE5i administration in patients with CVD				
No concern	16 (18.6%)	91 (20.6%)	.412	107 (20.4%)
Safety	22 (25.6%)	135 (30.7%)	.144	157 (30.0%)
Validity	36 (41.8%)	141 (32.0%)	.219	177 (33.8%)
Other	12 (14.0%)	71 (16.1%)	.407	83 (15.8%)
Paying attention to changes of both ED and CVD during the following visit	75 (94.9%)	334 (90.3%)	.187	409 (91.1%)

CVD = cardiovascular disease; ED = erectile dysfunction; IIEF-5 = International Index of Erectile Function-5; PDE5i = phosphodiesterase type 5 inhibitor.

the risk of CVDs in patients with ED and their attitudes to the use of PDE5is in patients with CVDs were not positive.

In their theoretical cognition of ED, a fairly large number of urologists in our investigation admitted the association between ED and CVDs. However, when considering the most important associative factors between ED and CVDs, only a few urologists primarily attribute the most important correlation to a common mechanism (as atherosclerosis). The fundamental reasoning underlying the close association mainly resulted from a common pathophysiologic background in accordance with a recent research.¹⁷ It concluded that the vast majority of urologists were not attentive to the connection between ED and CVDs. In our survey, a majority of urologists classify patients in accordance with the pathogenesis of ED in patients with ED and simultaneous CVDs. ED pathogenesis is classified as psychogenic, organic, or mixed psychogenic and organic. Arterial ED, which could be detected more accurately by real-time pharmacopeias Doppler ultrasonography, has been proved to be an influential factor in cardiovascular events.^{18,19} Nonetheless, the universal understanding of ED still remains a problem: almost half of the urologists believed that ED was a feature of the aging rather than a disorder. This might be due to a higher risk of ED in older people.²⁰

Generally speaking, there was a significant difference in perception of ED between female urologists and male urologists. More male than female urologists deemed ED as a disorder rather than a natural phenomenon of aging, chose to classify ED, and thought CVDs were associated with ED. Burd et al²¹

provided some supportive evidence for this finding that physicians reportedly perceived greatest discomfort when interviewing patients of opposite genders. ED was a male disease, and female urologists might feel reluctant to contact with patients with ED and investigate the theory of ED.

In the urologists' diagnosis of ED, most urologists inquired about cardiovascular disease in patients with ED. However, it seems they did not understand the connection between the examination of ED and CVDs. First, not a few numbers of urologists in our investigation were not concerned about the sex hormone level of patients. In fact, androgen not only plays an important role in erection and sexual behavior but also exerts important effects on the cardiovascular system. 2 recent studies suggested that subjects with hypogonadism treated with testosterone replacement therapy have a higher incidence of new cardiovascular events and low levels of testosterone are associated with atherosclerosis, CAD, and cardiovascular events.^{22,23} Second, many urologists were not concerned about the blood lipid and blood sugar of patients with ED. Many studies showed that diabetes and hyperlipidemia are common risk factors of ED and CVDs.^{7,24} Finally, almost half of the participants in our survey would not administer the IIEF-5 to assess the severity of ED. IIEF-5 could initially be applied to the assessment of ED.²⁵ Andrade et al²⁶ reported that the IIEF-5 score of the patients without CAD was significantly higher than the score of the patients with CAD. Moreover, urologists' evaluation of CVDs in patients with ED was also not updated. Although most urologists in our survey hold that the progress of these 2 diseases was

consistent, only half of them would consider doing a complete assessment of CVDs (using evaluation guide and did a physical examination and related examination) and even 97 urologists would not do any assessment of CVDs in patients with ED. The 2016 European Guidelines on cardiovascular disease specified that a complete evaluation of ED was important for the prognosis of CVDs.¹¹

In accordance with our analysis, old urologists (>40 years) focused more on cardiovascular risk in patients with ED: as the practicing years prolonged, urologists came to realize the correlation between ED and CVDs. In fact, urologists who view that CVDs were associated with ED also focus more on cardiovascular risks in patients with ED ($P < .001$). Therefore, it is advisable to popularize ED education and cardiovascular risks in patients with ED among young physicians so as to keep them informed of the significant indicators for determining the cardiovascular severity of patients with ED in the clinic. In addition, interestingly, Figure 1C and Table 5 showed whether to treat CVDs in patients with both ED and CVDs was associated with the levels of the hospitals ($P = .299$), whereas whether to assess CVDs in patients with ED was not associated with the levels of the hospitals ($P = .020$). The reasons might be that low-level hospitals can assess CVDs in patients with ED based on medical history and physical examination results even without equipment or devices of cardiovascular disease. Lin et al²⁷ found the admission rate for atrial fibrillation in the metropolitan hospital was significantly higher than that in the nonmetropolitan, so if urologists of low-level hospital found CVDs in patients with ED, they might suggest patients to visit higher level hospital to treat CVDs.

As urologists, participants' approach to the treatment of ED in patients was insufficient in their diagnoses of ED in our survey. Most of them only considered conventional treatments, such as psychological intervention and PDE5i therapy for their patients. In fact, more other treatments are also effective for ED. Testosterone therapy was beneficial for treating male sexual dysfunction, especially in men unresponsive to PDE5is and with mild ED.^{28,29} Moreover, the low level of serum testosterone represented an increased risk for CVDs, and men receiving testosterone therapy had reduced risks for CVDs.³⁰ Traditional Chinese medicine was another effective treatment for ED. Most Chinese herbs for ED, such as *Ligusticum chuanxiong* Hort and *Folium Ginkgo Bilobae* had a protective effect on myocardial ischemia.^{31–33} Acupuncture, another traditional Chinese medicine for ED, was proved to reduce the risk of coronary heart diseases.³⁴ Unfortunately, only a small number of urologists in our survey would consider testosterone therapy and traditional Chinese medicine. Of the 449 urologists in our survey, almost half of them would not consider penile implantation in medical refractory ED. Although resulting in many undesirable post-operative effects, including penile size reduction and cold sensation of the glans penis, the inflatable penile prosthesis was still the gold standard surgical treatment for medical refractory

ED.^{35,36} As a urologist, it is necessary to make a personalized treatment for patients with ED rather than a conventional treatment like a nonurologist do, especially many treatments for ED are also beneficial for controlling CVDs in patients.

Although most urologists indicated that they would treat CVDs in patients with both ED and CVDs, their view of PDE5is for CVDs was gloomy. A large number of participants showed some concerns, whereby the safety of PDE5is in cardiovascular events ranked first and only a few urologists thought that PDE5is had therapeutic significance for CVDs. However, several clinical data proved no association between sildenafil and cardiovascular events, proved no new safety risks relating to cardiovascular events and even found that PDE5is had therapeutic effects on CVDs by improving endothelial function and dilating blood vessels.^{12,13} It could be concluded that urologists' excessive concerns about the safety of PDE5is for CVDs are unnecessary. Moreover, 63.3% of participants agreed that the PDE5i should be taken regularly (once-daily) while others thought it should be on demand. Tang et al³⁷ found no significant difference in the improvement of penile erection and sexual satisfaction of patients with ED treated by on-demand and once-daily administration of PDE5is.

In addition, it seems that andrologists who are more professional in the diagnosis and treatment of ED have no better understanding of ED than nonandrologists. However, more andrologists chose to use IIEF-5, night penile erection, and hardness tests to evaluate the severity of ED. IIEF-5 not only is the most professional scale for evaluating ED but also reflects the severity of CVDs in patients.²³ Nonandrologists seem not to like to do a night penile erection for patients with ED. In fact, sleep-related erection not only is useful clinically for differentiating psychogenic and organic ED but could be related to several CVDs, especially hypertension.^{38,39} Nonandrologists of urologists need more understanding of sexual dysfunction because ED was showed a significant correlation with urinary system disease especially lower urinary tract symptoms caused by chronic prostatitis or benign prostatic hypertrophy.⁴⁰

Our survey also had one limitation. Our questionnaire was a not validated questionnaire because it was not strictly a dichotomously scored questionnaire and cannot be validated by the Kuder-Richardson Formula.

CONCLUSIONS

We have made a short and effective survey that measures the urologists' perception of ED and the association between ED and CVDs. Most urologists actually know about the risk of CVDs in patients with ED, but their assessment of CVDs in patients with ED was disappointing in the clinic. It may be necessary to further increase the vigilance of urologists in the clinical treatment of CVDs in patients with CVDs and ED. Older urologists and those with more professional experience devote more attention to the risk of CVDs in patients with ED.

Moreover, urologists' treatment of ED is far from professional, and their attitude to the safety of the PDE5i for CVDs is stuck in the past.

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SUPPLEMENTARY DATA

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