

Premature Ejaculation and Erectile Dysfunction in Male Partners of Infertile Couples: Prevalence and Correlation

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ABSTRACT

Objectives: The frequency of, and relationship between, the various manifestations of male sexual dysfunction in infertile couples have been poorly investigated, especially in Vietnam. Our study aims to assess the prevalence of premature ejaculation and erectile dysfunction in infertile couples using validated instruments, and the relationship between these disorders.

Method: Cross-sectional descriptive study, using validated questionnaires including the Premature Ejaculation Diagnostic Tool (PEDT) and the International Index of Erectile Function-15 (IIEF-15), to measure the incidence of these problems in 255 male partners of infertile couples who were examined from January through December 2017, at the Center for Reproductive Endocrinology & Infertility, Hue University Hospital.

Results: The prevalence of overt premature ejaculation was 4.7%, probable premature ejaculation was 7.1%, and erectile dysfunction was 26.3% (mild: 19.3%, mild-to-moderate: 3.9%, moderate: 2.7%, and severe: 0.4%). The PEDT total score was negatively correlated to IIEF-15-EFD and IIEF-15 total scores ($r = -0.322$ and $r = -0.348$, respectively).

Conclusions: In light of the identified prevalence of premature ejaculation and erectile dysfunction in the studied population, screening for these conditions should be included in the evaluation of infertile couples. These two disorders could negatively reciprocal effect on each other.

Keywords: Infertility; Premature Ejaculation; Erectile Dysfunction.

INTRODUCTION

There is a strong correlation between infertility and male sexual dysfunction: male partners of infertile couples have a higher incidence of sexual dysfunction than men in fertile couples (Tal, 2013). The most common manifestations of male sexual dysfunction are premature ejaculation (PE) and erectile dysfunction (ED). These problems not only make men lose confidence, feel confusion and distress, but also lead to impairment of sexual performance and damage to family relationships (Rosen et al., 1997; Symonds et al., 2007).

The prevalence of these two conditions has been reported to vary widely, depending on geographic area, studied subjects, and assessment methods — both with respect to assessment instruments and diagnostic standards. The frequency of PE in the general population reported by Spector in a literature review based on non-validated questionnaires, varied between 16% and 38% across all age groups (Spector and Carey, 1990). However, there are also other studies reporting a prevalence of PE as low as 4 to 5% (Simons and Carey, 2001), or as high as 75% (Kinsey et al., 1948). Other studies based on the Premature Ejaculation Diagnostic Tool (PEDT)

reported results with less deviation: for example, in Korea, 26.9% of the respondents were diagnosed with PE as defined by a cut-score of ≥ 9 (Lee et al., 2013); in Asia Pacific 15% of the respondents were diagnosed as probable PE via a cut-score of 9–10, and 16% were diagnosed as overt PE via a cut-score of ≥ 11 (McMahon et al., 2012).

The PEDT, which was developed by Symonds in 2007, based on the DSM-IV-TR (Diagnostic and Statistical Manual, fourth edition, text revision) of the American Psychiatric Association, is a brief, multidimensional, psychometrically validated instrument for diagnosing PE status (Symonds et al., 2007). It has suffered some criticism because its definition of PE was based on an IELT (intravaginal ejaculatory latency time) of ≤ 2 minutes, but the conclusion of the International Society for Sexual Medicine (ISSM) on the correlation between IELT and PE was different in the two international conferences following the publication of Symonds: They proposed an IELT of ≤ 1 for lifelong PE (in 2007) and IELT ≤ 3 for acquired PE (in 2014). The conclusion of the ISSM was published again in DSM-V (Serefoglu et al., 2014). However, the PEDT has still been considered to be reliable and valid by many studies because of the high correlation between PEDT-diagnosed

PE and IELT-diagnosed PE (Huang et al., 2014; Pakpour et al., 2014), or clinical PE diagnosed by urologists (Huang et al., 2014). In particular, using PEDT with a cut score of ≥ 9 could meet the updated standards of DSM-V in indicating both lifelong PE and acquired PE with respective sensitivities and specificities of 0.875; 0.913 and 0.865; 0.865 (Tang et al., 2017).

Unlike PE, the prevalence of ED has been shown to increase with age in all studies. According to a review article by Beutel, ED was diagnosed in the general population in 0.4% of men aged 20–30, 2.3% aged 30–39, and 9.5% aged 40–49. However, this result was relatively divergent from studies using different diagnostic instruments (Beutel and Weidner, 2006).

The International Index of Erectile Function (IIEF), a widely used instrument for evaluating ED which was developed by Rosen in 1997, is a brief, psychometric multi-dimensional self-report instrument. Its reliability and validity have been confirmed in testing in many different geographic locations, and across a wide range of etiologies and disease states (Rosen et al., 1997; Rosen et al., 2002). IIEF so far is widely accepted as the 'gold standard' tool for efficacy assessment in assessment of ED (Rosen et al., 2002).

Infertility occurs in 15%–20% of couples of reproductive age (Winters and Walsh, 2014), in which up to half of the causes were male-related (pure or combined). According to many review articles (Lotti and Maggi, 2018; Soni et al., 2017; Tal, 2013; Winters and Walsh, 2014), infertility is a serious psychological burden, and the frequency of sexual dysfunction tends to be higher in infertile couples. Those results were also found in several studies of PE in China (Gao et al., 2013) and the USA (Shindel et al., 2008) and in studies of ED in China (Gao et al., 2013), Canada (O'Brien et al., 2005) and Italy (Lotti et al., 2012). Although there was a high degree of consistency in the results of the ED studies, there were some contradictory findings in some of the PE studies, such as a study in Italy which concluded that the prevalence of PE in the infertility group was not different from that found in the general population (Lotti et al., 2012).

In addition, the relationship between PE and ED remains somewhat unclear although it has been investigated in some studies on the general population. Laumann et al. reported in a global research study that ED was an independent predictor of PE (Laumann et al., 2005), while Porst et al. pointed out that PE increased the risk of ED in a large sample study ($n = 12133$) (Porst et al., 2007). This relationship between PE and ED was also found by Tang et al. in a study using new evidence based on DSM-V, in which they pointed out that the total of score IIEF-15 correlated with the score of PEDT/lifelong PE ($r = -0.225$; $p < 0.001$) and with the score of PEDT/acquired PE ($r = -0.378$; $p < 0.001$), after adjusting for age (Tang et al., 2017). By contrast, Shindel et al. came to the conclusion that there was no relationship between PE and ED (Shindel et al., 2008).

To the best of our knowledge, in the population of infertile couples, there have not been many studies of PE prevalence using validated instruments, and there have been no studies evaluating the relationship between PE and ED. The purpose of this study was to determine the prevalence of PE and ED in a cohort of men in infertile couples by using the validated instruments of PEDT and IIEF, as well as to determine whether there was any correlation between these two conditions.

Methods

The study was cross-sectional descriptive in design. All participants in the study gave written informed consent. We studied a cohort of 255 male partners of infertile couples, who were examined from January through December 2017, at the Center for Reproductive Endocrinology & Infertility, Hue University Hospital.

Exclusion criteria included illiteracy, psychiatric disorders, known drug or alcohol dependence, treatment with medications such as antihypertensives or hormones, patients with penile anatomic defects, and those reporting no sexual activity over the previous 4 weeks because the husband had to work far from home and they did not live together. The data was collected via two Sexual Function Questionnaires: PEDT and IIEF. Individual respondents were assigned an identification code, but no personal information was recorded.

A letter explaining the study's purpose was given to infertile couples who came to our clinic, together with a consent form offered to male partners. If the couple agreed to participate in the study, basic sociodemographic variables and history of infertility were recorded from the male partner. Finally, the men were asked to answer the PEDT and IIEF questionnaires in private (i.e. without the attendance of their female partners).

In order to determine PE and ED status, we used Vietnamese-language versions of the Premature Ejaculation Diagnostic Tool (PEDT), and of the International Index of Erectile Function (IIEF).

PEDT is a self-reported questionnaire for diagnosing PE. The PEDT has 5 items regarding control, frequency, minimal stimulation, distress, and interpersonal difficulty. The overall PEDT score is calculated as the sum of the scores of these components, and ranges from 0–20. A PEDT score of ≤ 8 indicates no PE, 9–10 probable PE, and ≥ 11 overt PE (Symonds et al., 2007).

IIEF is a multidimensional, self-reported questionnaire for assessment of erectile dysfunction, including 15 items assigned to 5 domains (erectile function, orgasmic function, sexual desire, intercourse satisfaction and overall satisfaction). The erectile function domain of the IIEF (IIEF-15-EFD) has 6 items, with scores ranging from 6–30. Based on the IIEF-15-EFD score, the severity of ED can be categorized as: no ED (score 30–26), mild ED (score 25–22), mild to moderate ED (score 21–17), moderate ED (score 16–11), and severe ED (score 10–6) (Rosen et al., 1997).

These instruments followed the process of forward and back translations between the original language and Vietnamese, under the final test of the third translator, then edited to ensure the cross-cultural equivalence of the items between languages and reached reliability with Cronbach's coefficient which were 0.836 (> 0.7) and 0.901 (> 0.7) for PEDT and IIEF, respectively.

The data were collected by Epidata 3.1, and SPSS version 20.0 was used for data processing. Descriptive statistical analysis was applied to all variables, and the χ^2 test at $\alpha = 0.05$ significance was used to compare the difference between two or more proportions. A linear regression analysis was used to determine the correlation between PE and ED. Statistical significance was defined as $p < 0.05$ for the correlation between variables.

This study was approved by the Ethics Committee of Hue University of Medicine and Pharmacy. All information and data were encrypted and confidential.

RESULTS

The general characteristics of the subjects

As reported in Table 1, most of the subjects in this study were relatively young, employed, declared no religious identity, and had medium incomes. The mean infertility duration was 3.8 years \pm 3.1 (1–17.7) years, and the mean duration of treatment was 13.10 months \pm 12.36 (1–62) months; 70.2% of the participants suffered from primary infertility. The male infertility rate was 31.0% and infertility causes deriving from both partners was 22.4%; 7.1% had a history of IVF treatment, and 29.9% experienced at least one of two treatments including IUI and IVE, or both of those methods.

Table 1. General characteristics of the studied population.

Factors	n	%
Age (years)		
Mean \pm SD (range)	34.3 \pm 6.1 (22–59)	
Education		
Primary school	7	2.8
Secondary school	49	19.2
High school	75	29.4
College/University	124	48.7
Employment		
Present	253	99.2
Absent	2	0.8
Religion		
Present	51	20.0
Absent	204	80.0
Economy (self-reported)		
Low income	15	5.9
Medium income	229	89.8
High income	11	4.3
Duration of marriage (years)		
Mean \pm SD (range)	5.0 \pm 4.0 (1–18)	

SD: standard deviation.

Table 2. Correlation between PEDT and IIEF-15

Correlation	IIEF-15-EFD score	IIEF-15 total score
Pearson Correlation	−0.322**	−0.348**
PEDT total score Sig. (2-tailed)	0.000	0.000
N	255	255

**. Correlation is significant at the 0.01 level (2-tailed).

Prevalence of PE and ED

The mean PEDT score was 4.4 ± 3.4 (0–17), in which 12 men (4.7%), had PEDT scores ≥ 11 , and therefore were classified as having overt PE; and 18 men (7.1%), had PEDT scores from 9–10, and were classified as exhibiting probable PE. The mean IIEF-15 total score was 61.5 ± 8.0 (29–75). It is worth noting that, the mean IIEF-15-EFD (IIEF-15-Erectile Function Domain) score was 26.6 ± 3.6 (6–30). 67 men (26.3%) had IIEF-15-EFD scores ≤ 25 , and were therefore classified as suffering ED. Of these, the severity of ED was classified variously as: mild (49 men, 19.3%), mild to moderate (10 men, 3.9%), moderate (7 men, 2.7%), and severe (1 man, 0.4%).

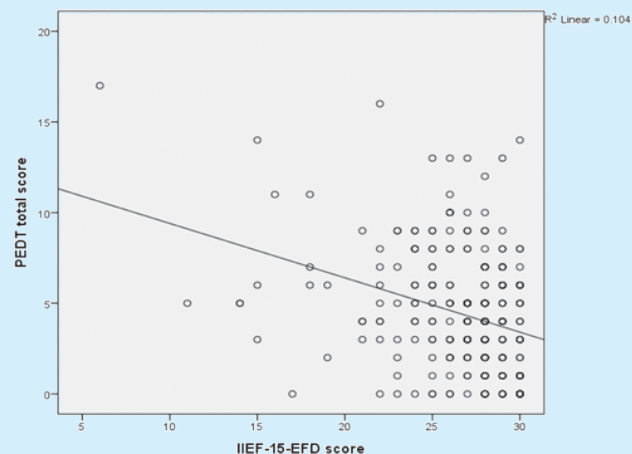
Correlation between PE and ED

The total PEDT score was inversely correlated to both the IIEF-15-EFD score ($r = -0.322$) and the IIEF-15 total scores ($r = -0.348$) as shown in Table 2 and Fig. 1.

DISCUSSION

In this study of the male partners of infertile couples in Vietnam, we reported that the prevalence of PEDT-diagnosed overt PE was 4.7%, and PEDT-diagnosed probable PE was 7.1%. We found a higher frequency of ED: the overall prevalence of ED was 26.3%, of which mild was 19.3%, mild-to-moderate was 3.9%, moderate was 2.7% and severe grade was 0.4%. In addition, we found that PE and ED were related to one another in infertile patients.

Fig. 1. Correlation between PEDT and IIEF-15-EFD.



The prevalence of PE in the male partners of infertile couples has been reported in only a few studies so far. In our study the prevalence was somewhat lower than the prevalence reported in other studies of PEDT-diagnosed PE with a threshold score of ≥ 9 . For example, while we found a prevalence of 11.8%, the prevalence reported by Lotti et al. in Italy was 15.6% (Lotti et al., 2012), and by Gao et al. in China was 19.01% (Gao et al., 2013). By contrast, some studies using invalidated questionnaires showed a very high PE prevalence compared to ours, such as the study by Jain et al. in India, which reported a prevalence of 66% (Jain et al., 2000), and Shindel et al. in the US, which reported a prevalence of 50% (Shindel et al., 2008).

Regarding ED, the prevalence indicated in our study was not much different from the prevalence previously reported in male partners of infertile couples of the same age (average of 30–36), in particular with the small number of moderate ED cases we found, and our observation of hardly any severe ED cases. For example, some studies examining IIEF-diagnosed ED (such as Lotti et al. in Italy) reported that the overall ED prevalence was 17.8%, of which mild was 13.1%, moderate to mild was 2.5% and moderate was 2.1% (Lotti et al., 2012), Shindel et al. in the US reported that the overall ED prevalence was 22%, of which mild was 18%, and moderate was 4% (Shindel et al., 2008). Some studies using other diagnostic instruments also showed an ED prevalence which was not significantly different, such as Jain et al. in India, who reported an ED prevalence of 15% (Jain et al., 2000), Gao et al. in China, who reported 18.05% (Gao et al., 2013), O'Brien et al., and Satkunasivam et al. in Canada, who reported 28% and 30.5%, respectively (O'Brien et al., 2005; Satkunasivam et al., 2014). Thus, unlike PE prevalence, ED prevalence in infertile couples was not significantly different across studies, despite the use of different diagnostic instruments.

In addition, it is important to recognize that sexuality is also influenced by many factors such as physiology, psychology, beliefs, economics, culture and so on, which vary across different races and geographical regions. Therefore, these factors also contribute to the difference in the prevalence of these two dysfunctional conditions across studies.

Regarding ED prevalence, although the medical literature shows an increase in ED in male partners of infertile couples, the demonstration of a causal relationship between erectile dysfunction and infertility is difficult, due to the cross-sectional nature of the studies. It was strongly suggested among researchers that ED might have been a consequence of the psychosocial effects of infertility.

First, ED might have led to a decrease in natural conception because of loss of ability and reduction of frequency of intercourse; second, ED might also have made it difficult to sex for baby-making during the infertility treatment. Furthermore, there were several common pathologies such as systemic diseases which may have contributed to both male infertility and ED, though these are rare (Lotti and Maggi, 2018; Soni et al., 2017).

The mechanism of the association between PE and ED, is still unclear. Rowland et al. have suggested that a pathological cycle might have formed in some instances. Specifically, men who suffer from PE may try to delay their ejaculation by actively reducing their level of excitation. This in turn may lead to an erection which does not reach the optimal level, and gradually may have increased the risk of ED. By contrast, men who suffer from ED may attempt to increase penile erection by increasing the level of instinctive excitation, thereby inadvertently leading to PE (Rowland et al., 2010). But Wincze JP said that PE and ED may be comorbid conditions due to the psychological pressure of infertility (Wincze, 2015).

The findings of our study support the assumption that infertility and sexual dysfunction are closely related. Thus, in order to limit or prevent the superimposition of the psychological burdens accompanying sexual dysfunction on the stresses of infertility treatment, the evaluation of male sexual dysfunction should be a part of a comprehensive approach to the management of infertility. In addition, because ED and PE are related, when male partners of infertile couples suffer from one of those dysfunctions, it is necessary to evaluate the other.

The strength of our study was the use of validated self-reporting instruments, which have high validity and reliability. In particular, PEDT was used for the diagnosis of PE, while there were other different diagnostic instruments used which led to an extremely different representation of the prevalence of dysfunction. These instruments, which ensure the accuracy of the translation process, are reliable for the Vietnamese version. However, the limitation of the study was that the research design was cross-sectional, and hence the finding of a statistically significant association did not imply causality. Additional studies will be required to clarify the correlation between sexual dysfunction and infertility, as well as among the domains of male sexual dysfunction.

In conclusion, sexual dysfunction can occur in males in infertile relationships. This may impact on fertility, but may also direct medical attention for proper assessment of the man particularly those with ED. Premature ejaculation and erectile dysfunction should be screened in the male partners of infertile couples, as their occurrence is more prevalent in this population. In those men, premature ejaculation and erectile dysfunction are correlated, and dysfunction in one of these areas could have increase dysfunction in the other.

DECLARATION

Ethics approval: This study was approved by the Ethics Committee of Hue University of Medicine and Pharmacy. All information and data were encrypted and confidential.

Consent for publication: All authors have been involved in the research work and consent for publication.

Availability of data and material: All data are available and would be shown as requested.

COMPETING INTERESTS

The authors have no competing financial or other interests to declare in relation to this manuscript.

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AUTHORS' CONTRIBUTIONS

T.T.T.H, M.T.L participated in the study design, data collection, data analysis, manuscript drafting and critical discussion. V.Q.H.N, Q.V.T and N.T.C participated in the study design, interpretation of data and critical discussion. All authors have been involved in drafting the work or revising it critically for important intellectual content of the final manuscript.

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