



Correlation between premature ejaculation and psychological disorders in 270 Chinese outpatients



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ARTICLE INFO

Keywords:

Premature ejaculation
Ejaculation latency
Psychological disorder
Sleep disturbance

ABSTRACT

Clinical patients with premature ejaculation(PE) often present with poor psychological state. This study investigated whether there is a difference in the psychological state of PE and non-PE in outpatients, and whether there is a correlation between ejaculatory latency and psychological disorders. We studied demographics information and psychological indicators for PE patients and control group, including the Self-Rating Anxiety Scale(SAS) and Self-Rating Depression Scale(SDS), Pittsburgh Sleep Quality Index (PSQI) and recorded the ejaculatory latency. We analyzed the relationship between PE and psychological disorders by the Pearson correlation and multifactorial logistic regression. There were significant differences in SAS($p < 0.01$) and SDS ($p < 0.05$) scores between the PE and non-PE groups. However, Pearson correlation analysis showed that there was no correlation between ejaculatory latency and SDS. Multifactorial logistic regression analysis showed that anxiety($p < 0.05$) and sleep quality($p < 0.05$) were closely related to the attack of PE. The incidence of anxiety and depression in PE patients is high, anxiety is a risk factor of PE. Clinicians should pay close attention to the psychological state and sleep quality of patients with PE.

1. Introduction

Premature ejaculation(PE) is one of the most common diseases in ejaculatory disorders, the morbidity of PE is 14%–30% in adult men (Harrison et al., 2013), which is usually evaluated by the ejaculatory latency(intra-vaginal ejaculation latency time, ejaculatory latency) during sexual intercourse. According to the report from the International Society of Sexual Medicine (ISSM), PE is defined as a male sexual dysfunction characterized by ejaculatory latency less than 1 min from the first sexual intercourse (lifelong type) or a significant reduction in ejaculatory latency to about 3 min or less (acquired type) (Althof et al., 2014). However, definitional controversies exist in different groups of PE men (e.g., in some PE groups the ejaculatory latency is 2 min; in others, it is 6 or more minutes) (Althof et al., S.E. 2016). It is likely that a complex interaction between neurophysiological factors predominantly affect PE. Particularly, impairment of inhibitory serotonergic pathways that regulate ejaculation, modulated by 5-HT_{2c}, 5-HT_{1a}, and 5-HT_{1b} receptors and synaptic serotonin transporters has been reported for lifelong PE (Jern et al., 2007; Janssen et al., 2009).

Other factors, such as chronic prostatitis and hyperthyroidism, may also be associated with acquired PE (Liang et al., 2004; Maggi et al., 2013). Men suffering from andrological problems, including erectile dysfunction and PE, usually have concomitant psychosocial problems

(Hunt et al., N. 2013). It has long been thought that anxiety and depression play an important role in the development and maintenance of sexual dysfunction (Hale and Strassberg, 1990; Hedon, 2003). Although there are some psychological explanations as to why a man develops PE, none of these theories are derived from evidence-based studies (Althof, 2006), and it is also considered that organic, neurobiological factors rather than psychological problems, are implicated in the development of primary PE (Waldinger, 2007). Interestingly, Porst et al. (2007) reported that anxiety was a factor associated with male sexual difficulties, particularly PE. The role of psychological factors in the pathogenesis of PE is still controversial. The impact of lifestyle, including smoking, drinking, weight and exercise on PE has also been studied (Gao et al., 2014; Ventus et al., D. 2016). There are not yet relevant studies on whether sleep affects PE. It is well known that sleep quality interacts with anxiety and depressive symptoms, thus, we consider that it is necessary to study the effect of sleep quality on PE as a possible risk factor. Demographic factors have also been studied (Paduch et al., 2015), in order to eliminate the risk factors of PE.

PE is generally treated with local anesthetic and selective serotonin reuptake inhibitor (Dapoxetine) (Pavone et al., 2017). However, combined therapy may be more effective than pharmacological therapy alone for men with PE (Melnik et al., 2009). Psychological and behavioral treatment on PE have been based on the hypothesis of an

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<https://doi.org/10.1016/j.psychres.2018.12.038>

Received 16 April 2018; Received in revised form 1 November 2018; Accepted 6 December 2018

Available online 06 December 2018

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emotional etiology of the disorder, and on physical rehabilitation through special techniques such as squeeze-pause and start-stop (Cooper et al., 2015). Although psychotherapy has been considered as a possible treatment of PE, it has fallen into disuse in the clinical practice due to limited time and the consideration that it is not effective for sexual disorders (Di Maria et al., Di 1995). However, in practical clinical work, PE patients usually present with poor psychological state, and clarification of the relationship between PE and psychological disorders is essential for proper assessment and treatment of PE. The purpose of this study was to determine whether there were differences in demographic factors, psychological disorders, and sleep quality between PE patients and normal people.

2. Methods and materials

2.1. Participants

Participants were 362 patients between the ages of 20 and 48 who were not satisfied with sexual intercourse time. Twenty-seven patients on medications that may affect sexual intercourse time, such as antidepressants, or with alcohol abuse, diabetes, neurologic injury, or abnormal hormones were excluded. From January 2016 to December 2017, a non-interventional, observational, cross-sectional survey was conducted in Wuhu, Anhui Province, China. A total of 270 participants completed the whole research process. Of them, 184 patients were classified as PE group and the other 86 patients were included in the non-PE group after assessment of ejaculatory latency.

2.2. Measurement tools

Depression was evaluated by the Self-Rating Depression Scale (SDS) (Shen et al., 2012), which was confirmed to be reliable and valid for depression screening of the Chinese population. The questionnaire consisted of 20 questions, each question had four possible answers, individually assigned 1, 2, 3 or 4 points (1 = rarely, 2 = occasionally, 3 = frequently and 4 = always). After the questionnaire was completed, the total score was combined and the score ≥ 50 was used as a threshold for determining depression. Higher scores indicate greater depression.

Anxiety symptoms were measured with the 20-item Self-Rating Anxiety Scale (SAS) (Zung, 1971). The scale corresponds well with the assessment of anxiety and has been found to be reliable in epidemiological surveys of the Chinese population. Each item contains four options that describe how often the respondents had each feeling in the past week on a 4-point Likert scale ranging from “none or a little of the time (< 1 day)” (denoted as 1) to “most or all of the time (5–7 days)” (denoted as 4). The total score on the SAS was calculated, and the score ≥ 50 was used as a threshold for determining anxiety. Higher total scores indicate greater anxiety.

Sleep disturbance was assessed using the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989), a self-rated questionnaire that assesses sleep problems in seven aspects including sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. The reliability and validity of the PSQI were supported by various researches in populations of mixed-age healthy controls, sleep clinic patients and other medical conditions. A global score ranging from 0 to 21 is generated from the sum of the component scores. Individuals with total PSQI scores of ≥ 7 are identified as having sleep problems.

Demographic information was collected from all participants. Information included age (divided into three groups, 20–29 years old, 30–39 years old and 40–49 years old), body mass index (BMI), smoking, educational status (divided into four groups, primary school, middle school, high school and university), monthly income (divided into three groups, < 3000 RMB, 3000–5000 RMB and > 5000 RMB) and length of marriage.

2.3. Assessment of ejaculatory latency

The ejaculatory latency is the time from vaginal penetration until ejaculation and was timed on a stopwatch. Either of the partners was allowed to handle the stopwatch, however, it was requested that the same person remain responsible for every ejaculatory latency measurement for the duration of the study, and they were asked to be honest in recording the time. They were instructed to calculate and record the exact time after ejaculation. In this study, we classified patients with ejaculatory latency greater than 120 sec in the non-PE group and the ejaculatory latency less than 120 sec into the PE group. We recorded the ejaculatory latency of the PE group as nearly 10, 30, 60, 90 and 120 sec respectively, while the ejaculatory latency of the non-PE group was recorded as nearly 180, 240, 300, 360, 420, and 480 sec respectively. The ejaculatory latency of all the studied subjects was within 480 sec.

2.4. Procedure

Ethics approval was granted by the Research Ethics Committee of Wannan Medical College, Wuhu, China. All participants were informed and agreed to the study. The demographic information of participants were recorded first, and then the SAS, SDS, and PSQI of participants were investigated by questionnaires. After the participants recorded their ejaculatory latency, they were divided into PE and non-PE groups, according to their feedback.

2.5. Statistical analysis

The data acquired in this study were analyzed by the SPSS v13.0 (SPSS Inc., Chicago, IL, USA). Differences in numerical variables were examined by Student's *t*-test. The Chi-square test was used to compare categorical data including PSQI between the PE and non-PE groups. To explore the relationship between different SAS or SDS and PE, the difference was analyzed using Pearson's correlation analysis. Multifactorial logistic regression analysis was performed on the relevant variables in order to conduct a one-off analysis of all possible factors and to correct the effects of confounding factors. All statistical tests were two-sided ($\alpha = 0.05$ or 0.01).

3. Results

3.1. Sample characteristics

362 patients participated in the study and 270 patients (74.6%) were included in this analysis. Overall, this cohort of men was young (mean age: 34.7 years, range: 20–48 years), of healthy weight (51.2% BMI < 25), non-smoking (52.6%). The mean SDS was 46.7 and mean SAS was 46.5. Demographic statistics can be found in Table 1. There was no statistically significant difference between the PE and non-PE groups in the variables of age, length of marriage, BMI, education level, and monthly salary, except the variable of PSQI ($p < 0.05$).

3.2. Differences between the PE and non-PE groups in SAS, SDS, and PSQI

The *t*-test results are presented in Table 2, there were statistically significant differences between the PE and non-PE groups in SAS ($p < 0.01$) and SDS ($p < 0.05$) scores. PE or non-PE served as dependent variable, and PSQI, SAS, and SDS as independent variables. Multifactorial logistic regression analysis in Table 3 showed that anxiety ($p < 0.05$) was a risk factor of PE, 95% CI was 1.020–1.396, sleep quality was also closely related to PE, 95% CI was 1.080–2.697. Moreover, correlation analysis in Figs. 1 and 2 showed that there was a correlation between SAS and ejaculatory latency in both PE and non-PE groups, but there was no significant correlation between SDS and ejaculatory latency in either PE or non-PE group.

Table 1
Demographics information of participants in PE group and non-PE group.

Characteristics	PE group(n = 184)	non-PE group(n = 86)	p-value
Age, years			0.512
20–29	84(45.7%)	26(30.2%)	
30–39	52(28.3%)	30(34.9%)	
40–49	48(26.0%)	30(34.9%)	
BMI, kg/m ²	25.86 ± 5.62	25.15 ± 5.85	0.823
Cigarette smoking			0.664
Yes	88(47.8%)	40(46.5%)	
No	96(52.2%)	46(53.5%)	
PSQI			0.033
≥ 7	116(63.0%)	32(37.2%)	
<7	68(37.0%)	54(63.8%)	
Educational status			0.792
Primary school	16(8.7%)	10(11.6%)	
Middle school	20(10.9%)	14(16.3%)	
High school	62(33.7%)	24(27.9%)	
University	86(46.7%)	38(44.2%)	
Monthly income (RMB)			0.548
< 3000	24(13.0%)	14(16.3%)	
3000–5000	62(33.7%)	32(37.2%)	
> 5000	98(53.3%)	40(46.5%)	
Length of marriage (year)	4.28 ± 3.06(1–22)	4.31 ± 3.44(1–25)	0.352

PE: Premature Ejaculation; BMI; Body Mass Index; PSQI: Pittsburgh Sleep Quality Index

Table 2
Comparison of SAS and SDS in PE and non-PE patients (t test).

Variables	PE(n = 184)	non-PE(n = 86)	t	p-value
SAS	51.1 ± 11.2	37.5 ± 6.7	-3.529	0.001
SDS	49.1 ± 8.7	41.9 ± 9.7	-2.076	0.047

PE: Premature Ejaculation; SAS: Self-rating Anxiety Scale; SDS: Self-rating Depression Scale

Table 3
Multifactorial logistic regression analysis of PSQI, SAS and SDS.

Variables	B	SE	OR	95%CI	p-value
PSQI	0.535	0.233	1.707	1.080–2.697	0.022
SAS	0.177	0.080	1.193	1.020–1.396	0.027
SDS	0.086	0.043	1.089	1.002–1.174	0.058

PSQI: Pittsburgh Sleep Quality Index; SAS: Self-rating Anxiety Scale; SDS: Self-rating Depression Scale

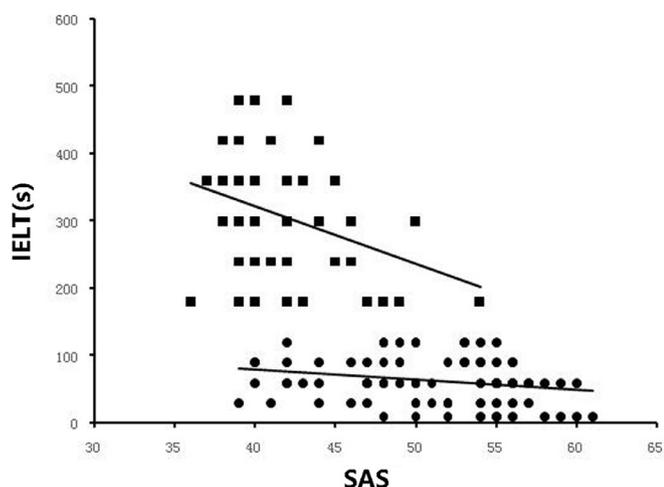


Fig. 1. Correlation between SAS scores and ejaculatory latency. The scatterplot shows the results of Pearson's correlation analysis. Round dots represent data from patients with PE($r = -0.221$, $p = 0.034$) while square dots represent data from the non-PE group($r = -0.343$, $p = 0.024$).

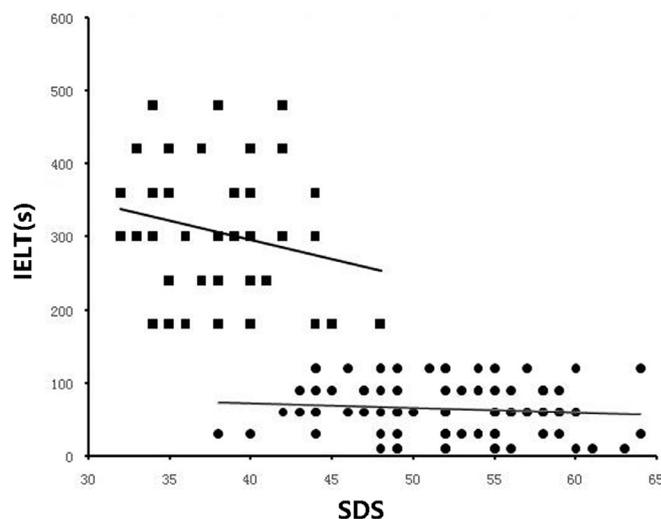


Fig. 2. Correlation between SDS scores and ejaculatory latency. The scatterplot shows the results of Pearson's correlation analysis. Round dots represent data from patients with PE($r = -0.101$, $p = 0.337$) while square dots represent data from the non-PE group($r = -0.220$, $p = 0.156$).

4. Discussion

PE is a common male sexual dysfunction, the incidence is increasing in recent years. Although it does not threaten life, it seriously affects male psychology, self-esteem, family harmony and stability. Negative psychological effects of PE can be displayed as personal distress, anxiety, and depression, which can impair physical and mental health of PE patients and their partners (Hartmann et al., 2005). Several studies have shown that negative psychological disorders might play an important role in precipitating or maintaining PE (Patrick et al., 2005; Zhang et al., 2013; Mourikis et al., 2015). However, some researchers consider that PE is not a psychological disorder but a neurobiological phenomenon (D. Waldinger et al., 2002). In response to this controversy, we attempted to examine the relationship between PE and psychological disorders (anxiety and depression) by means of questionnaires in a Chinese population. We also investigated the differences in some demographic attributes between PE patients and non-PE people, and for the first time focused on the potential relationship between sleep quality and PE.

This study found that symptoms of anxiety and depression in patients with PE were more significant than those in normal subjects. The results suggested that anxiety may be a risk factor of PE, consistent with this finding, Rajkumar and Kumaran (2014) reported that performance anxiety during intercourse was significantly associated with acquired PE. In a study on the epidemiology of depression in men with PE, an association was observed between PE and depression, with an odds ratio (OR) of 1.39 (Son et al., 2011). However, some reports showed that patients with PE are less likely to experience depression symptoms, a finding that further supports the neurobiological nature of the disorder possibly influenced by hereditary factors (Nobre, 2010; Jannini et al., 2012).

Continuous change in the woman's attitude across the duration of PE may increase the man's negative psychological effects, such as depression. Hence, greater duration of PE may create or enhance emotional and physical dissatisfaction between partners (Graziottin and Althof, 2011). Moreover, the definitions of depression and PE in the included studies were extremely variable, which may cause misclassification bias and heterogeneity. Even if there is some correlation between PE and depression, the underlying mechanism of how depression contributes to PE has not been fully elucidated. Some authors have suggested that psychological disorder activates the sympathetic nervous system and reduces the ejaculatory threshold (Janssen et al.,

2009). In our study, although depression was closely related to PE, the SDS score was not significantly related to the ejaculatory latency, which may be caused by inaccurate and unstable ejaculatory latency record. We found that there was a certain correlation between sleep quality and PE. However, it is not possible to conclude that sleep has a direct impact on the ejaculatory latency, because there is an interaction between sleep itself and psychological disorders. Although we did observe the effect of sleep quality on the ejaculatory latency after excluding psychological factors through multivariate regression analysis, other potential disturbances can not be ruled out. At present, there is no corresponding other research to support the role of sleep, so its mechanism must be further clarified.

With the introduction of SSRI in the treatment of PE, several studies have concluded that combined therapy is more effective than pharmacological therapy alone for men with PE (Abdo et al., 2008; Althof et al., S.E. 2013). There is also concern that the administration of medical treatments for sexual disorders without attention to psychological factors may not be sufficient (Rosen et al., R.C. 1995). The results of our research reconfirmed this view, although psychological therapy is used less in current clinical practice because of time constraints, costs, and requirement for strong compliance from couples. In this study, we also took age, marital length, height, weight, education level, monthly salary, and other personal factors as variables that may affect PE, but it was found that there was no significant correlation between these variables and PE, except sleep quality.

Limitations

Although we concluded that sleep quality might be closely related to PE, we still can not conclude that sleep is a risk factor for PE, because PE itself, as well as accompanying anxiety and depression, can lead to sleep disturbance. Meanwhile, we may have ignored other possible risk factors of PE such as long-term masturbation and chronic prostatitis, which must be further explored. We required patients to keep a strict record of the ejaculatory latency, however, the latency of each individual ejaculation is not exactly the same every time, and the actual operation of patients may have some discrepancy with our requirements, which may have some impact on the results.

Conclusion

Our study suggested that clinicians should pay more attention to the psychological health and sleep quality of patients with PE.

Notes

Conflict of interest statement

We declare that we have no financial and personal relationships with other people or organizations that can inappropriately influence our work, there is no professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of, the manuscript entitled, "A cross-sectional study on the correlation between premature ejaculation and psychological disorders in 270 Chinese outpatients" .

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