The Prevalence of Atherosclerosis and Related Factors in Both Types of Premature Ejaculation (Acquired and Lifelong) in Men

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Abstract

Background: investigate the prevalence and The related factors between the two types of premature ejaculation (lifelong PE[LPE], acquired PE [APE] in men and atherosclerosis.

Methods: One hundred patients complaining of PE and 100 control subjects were enrolled in this prospective study.All cases underwent a full medical history and Clinical examination.Blood pressure,serum lipid profile, testosterone,and Body mass index (BMI) were measured.The Arabic index of premature ejaculation (AIPE) and self-estimated (IELT) Intravaginal latency time was used for PE evaluation. Atherosclerosis was diagnosed by measuring the Carotid artery intima-media thickness (CIMT). Patients were divided into two major groups, (Group 1) [PE group] and (Group 2) [Control group].

Results: The mean age of cases in (group1) and (group 2) were 44.5 ± 11.7 versus 42.3 ± 10.8 yrs. The Systolic BP, diastolic (BP), Serum Triglycerides, serum LDL (BMI), the prevalence of atherosclerosis and smoking rate showed higher results in (group1) compared to group2, with significant difference ($p<0.001$). The IELT was significantly lower in group1 (2.67± 1.25) compared to group2 (3.77±1.52), ($p<0.001$). The prevalence of APE (74%) was significantly higher than LPE (26%) in group1($p<0.001$). regression analysis revealed that patients with APE showed more comorbidities than LPE patients concerning the prevalence of atherosclerosis, hypertension, and hyperlipidemia ($p<0.001$ for all items).Both of APE and LPE were significantly related to age>35y, BMI ≥ 25 kg/m2, smoking, Bl pressure and hyperlipidemia ($p<0.001$ for all factors).

Conclusions: Both types of PE,predominately the APE type,are associated with atherosclerosis, hypertension, and hyperlipidemia. The APE type reported more prevalence than the LPE.

Background

Premature ejaculation (PE) is considered the most frequent sexual dysfunction affecting about 15–30% of males above the age of 18 years[1].

In 1994, Waldingeriet al.[2] Presented the intravaginal ejaculation latency time (IELT) as a technique to evaluate the ejaculation time of heterosexual intercourse.The (IELT) is determined as the time starting from the moment of vaginal penetrationsuntil the moment of intravaginal ejaculation.And measured by stopwatchi if ejaculation occurred outside the vagina, the IELT is estimated to be zero.

The International society of sexual medicine (ISSM) established the united definition of both acquired and lifelong PE. In April 2013, as “a male sexual dysfunction manifested by ejaculation which always or nearly always occurs earlier to or within about 1 minute of vaginal penetration from the 1st sexual experiences (lifelong PE), or, a clinically significant and bothersome decrease in latency time, often to about ≤ 3 minutes (acquired PE),and the incapability to delay ejaculation on all or approximately all virginal penetrations, and worse personal consequences, as distress and frustration and or evasion of sexual intimacy [3]

Gao et al.showed that patients with PE complaints, always suffer from comorbidities, such as chronic prostatitis. Hypertension, diabetes mellitus, cardiovascular diseases, varicocele, etc.[4] Moreover, Lewis et al. established that CV risk factors such as smoking, Body mass index (BMI), hypertension, heavy dietary intake of cholesterol, and unsaturated fat have been reported as predictors of sexual dysfunction[5]. Hypertension damages the endothelium through increasing the hemodynamic pressure on endothelium and enhance the permeability of arterial walls for lipoproteins and sequentially accelerate atherosclerosis[6].

All organs in the body, including the genital organs, require an adequate blood supply to obtain oxygen and nutrition to function probably.Many shreds of evidence have confirmed that hypoxia, ischemia,and oxidative stress produced by that arterial occlusive disease such as atherosclerosis are important etiologic factors in male sexual dysfunction [7]

Currently, non-invasive technique for measurements of arterial intima-media thickness (IMT) was generally used for evaluation of subclinical arterial changes and well known that this was a good predictor of significant cardiovascular disease CVD[8].Carotid intima-media thickness (CIMT),which is detected and estimated by ultrasound using the B-mode,is a subclinical indicator of atherosclerosis.Furthermore, measurementsof atherosclerotic plaque extents in the carotid artery are important to follow up and in assessments alterations of atherosclerosis [9]

There are no studies that have systematically evaluated the correlation between atherosclerotic changes and PE complaints. Therefore, the current study performed to investigate the prevalence and The related comorbidities between the two types of premature ejaculation (lifelong PE[LPE], acquired PE [APE] in men and atherosclerosis

Methods

A total of 100 patients aged (25–65) years,who visited the outpatient clinic with the complaint of premature ejaculation and 100 normal control cases were enrolled in this prospective study.

The present study protocol was reviewed and approved by the National. Institution’s Research Ethics Committee, faculty of medicine. Informed consent was taken from all patients.

All patients completed full medical and sexual history,including the medications and drugs.Serum testosterone, lipid profiles, blood pressure, and Body mass index (BMI) were measured. Patients should have regular normal heterosexual relationships at least within the previous 6 months with normal erectile function (the International Index of Erectile Function-5 score [IIEF-5] ≥ 22).We exclude patients with Urologic diseases (including malignancies, urinary tract infections, trauma, diabetic patients, previous operations, and neurologic bladder disease), psychiatric or neurologic disorders, thyroid dysfunction and patients consuming alcohol or drugs that affect sexual function (e.g.,phosphodiesterase type 5 inhibitors, selective serotonin reuptake inhibitors, and any antipsychotic drugs)

The participants' evaluation included intravaginal ejaculatory latency time (IELT) self-estimated in addition to the Arabic index of premature ejaculation questionnaire (AIPE). PE is determined when the AIPE is ≤ 30 [10]. AIPE is a seven-question questionnaire that supports various items of sexual activity, including, libido (Q1), erection (Q2), intravaginal ejaculatory latency time (ELT) (Q3), control ejaculation (Q4), couple satisfaction (Q5–6) and the psychological influence of PE (Q7)[10]. Results were classified as severe [7–13], moderate [14–19], mild-moderate [20–25] and mild [26–30].

Atherosclerosis was diagnosed by measuring the carotid artery intima-media thickness (CIMT) **(Fig-1**). A well-defined lesion with a focal thickening ≥ 1.2 mm within of carotid artery was considered as carotid plaque **(Fig-2)**, and documented atherosclerosis [11]. It was detected by an expert radiologist using (ultrasound machine GE Logiq 5, USA) with a linear array transducer working with frequency range 7–10 MHz. the measurements were taken at the common carotid artery bilaterally, three measurements were taken on both sides (anterior,lateral, and posterior projections) of the far and near the wall. Then, the average of all the reported reading was recorded [11]. Patients were divided into two main groups, (Group 1) [PE group] and (Group2, control group). The two groups were evaluated and analyzed using the parameters obtained.

Statistical analysis

Statistical analysis was achieved using SPSS computer program, version 21 (Statistical Package for the Social Science; Chicago, IL). Data were demonstrated in expressions of mean ± standard deviation (SD), Median or frequencies and percentages%.The Comparison between the two groups was completed by using Student's t-test. Mann-Whitney test used for numerical with the abnormal distribution.Pearson's Chi-squared ($\chi 2$) test used to compare the non-parametric data.Multiple logistic regression analysis performed to analyze affecting factors. P values < 0.05 were revealed statistically significant.

Results

The number of cases in each group was 100. The mean age of patients in (group1) and (group 2) were 44.5 ± 11.7 versus 42.3 ± 10.8 yrs. With an insignificant difference (P > 0.35). Systolic and diastolic blood pressure of [Group 1] & [Group 2] were 138 ± 11 vs 127 ± 12 mmHg and86.3 ± 7.1 vs 78 ± 5.1 mmHg, respectively, and these differences reported a statistically significant (p < 0.001).**(**Table 1).Blood serum level of triglycerides, HDL cholesterol, and LDL cholesterol in [Group1] were 0.98 ± 0.7, 1.24 ± 0.6 and 5.21 ± 0.4 mmol/L, respectively, versus 1.97 ± 0.8, 1.63 ± 0.4 and 4.10 ± 0.3 mmol/L, respectively, in [Group 2] with statistically significant differences. (P < 0.001). Group 1 represents a significantly higher smoking rate than group 2 (P < 0.001).

Table 1
Demographic characteristics of the patients and control

Patients 'data	Premature ejaculation (group1)	Normal (No premature) Control (Group 2)	P value
Number of patients	100	100	(NS)
Atherosclerosis	56 (56%)	26 (26%)	<0.001^
Age (years)	44.5 ± 11.7	42.3 ± 10.8	(NS)
Systolic Bl P (mmHg)	138 ± 11	127 ± 12	< 0.001^
Diastolic Bl P(mmHg)	86.3 ± 7.1	78 ± 5.1	< 0.001^
Triglycerides (mmol/L)	0.98 ± 0.7	1.97 ± 0.8	< 0.001^
Serum HDL (mmol/L)	1.24 ± 0.6	1.63 ± 0.4	< 0.001^
Serum LDL (mmol/L)	5.21 ± 0.4	4.10 ± 0.3	< 0.001^
Smoking	49 (53)	59(59)	< 0. 001^
Testosterone(ng/dl)	4.3 ± 1.4	4.1 ± 1.1	NS ^^
BMI (Kg/m²)	26 .3 ± 5.1	22.5 ± 4.5	< 0.001^
IPSS	16 (7–22)	15 (6–20)	NS
LPE	26 (26%)	–––	
APE	74 (74%)	–––	
IELT (min)	2.67 ± 1.25	3.77 ± 1.52	< 0.001^
AIPE, NO. (%)			
Mild	20 (20%)		
Mild-Moderate	40(40%)		
Moderate PE	25 (25%)		
Severe PE	15(15%)		

P value < .05 (statistically significant); NS,= Non-significant. ^student's t- test. ^^X^2 test. LPE = Lifelong premature ejaculation; APE = Acquired premature ejaculation;

Data were presented as

1- mean ± SD when normal distribution

2- Median when no normal distribution.

The finding got off the body mass index (BMI) represents significant increase in [Group 1], compared with [Group 2] 26 .3 ± 5.1 Vs 22.5 ± 4.5, respectively. (P < 0.001). (Table 1)

Regarding the premature ejaculation types, there was a significant increase in the prevalence of APE (74%)compared to LPE (26%) (P < 0.01) (Table 1,2).There is no significant difference between groups regarding IPSS and testosterone.

Table 2
Demographic characteristics of the PE patients (LPE type and APE type)

Variable	Premature Ejaculation (Group 1) (N = 100)		P value
	LPE (N = 26)	APE (N = 74)	
Number of patients	26%	74%	<0.001^
Atherosclerosis	10/26 (38%	46/74 (62%)	<0.001^
Age (years)	37.15 ± 11.7	41.5 ± 12.7	< 0.001^
Systolic Bl P (mmHg)	129 ± 10.9	136 ± 12.4	< 0.005^
Diastolic Bl P(mmHg)	83.3 ± 6.1	89 ± 7.1	< 0. 01^
Triglycerides (mmol/L)	0.95 ± 0.9	1.89 ± 0.7	< 0.001^
Serum HDL (mmol/L)	1.65 ± 0.6	1.42 ± 0.4	< 0.001^
Serum LDL (mmol/L)	4.52 ± 0.4	3.60 ± 0.8	< 0.001^
Smoking	12 (46%)	54 (72%)	< 0. 01^
Testosterone(ng/dl)	4.1 ± 2.5	4.4 ± 1.9	NS ^^
BMI (Kg/m²)	22 .4 ± 5.1	26.5 ± 4.5	< 0.001^
IPSS	12.8 ± 8.7	13.9 ± 8.3	NS
IELT (min)	0.94 ± 1.15	1.83 ± 1.53	< 0. 01^
LPE = Lifelong premature ejaculation; APE = Acquired premature ejaculation;			
Using x^2 test			

APE compared to LPE reported significant differences in Number of patients (P < 0.001), mean age (P < 0.001), smoking rate (P < 0.01), BMI(P < 0.001), IELT (P < 0.01), the prevalence of atherosclerosis (P < 0.001), systolic BL P(P < 0.005), Diastolic BL P(P < 0.01), and Lipids profile (P < 0.001) (Table 2).

As reported (on Table 3),concerning APE and LPE and the comorbidities and related factors by using Multiple logistic regression analysis. APE showed significant association with (systolic Bl.P, Diastolic Bl.P, HDL, LDL, Triglyceride, smoking, BMI(≥ 25 Kg/m2) and Age (≥ 35 yrs.) of the patient (P < 0.001, P < 0.001,

P < 0.002, P < 0.002, P < 0.003,P < 0.001,<0.001 and P < 0.001,respectively) .However, LPE showed a significant correlation only with BMI, patients' ages and smoking (P < 0.002,P < 0.001&P < 0.01, respectively).

Table 3
Affecting factors for LPE and APE using (Multiple logistic regression analysis)

Affecting Factors	LPE			APE		
	P value	OR	95% CI	P value	OR	95% CI
Sys Bl.P	0.650	1.001	0.971–1.030	< 0.001	1.38	1.30–3.25
Dis Bl.P	0.661	1.002	0.990–1.020	< 0.001	1.49	1.28–3.33
HDL	0.390	0.978	0.969–1.030	< 0.002	2.11	1.35–3.98
LDL	0.298	0.991	0.975–1.006	< 0.002	2.30	1.63–3.90
Triglycer	0.360	0.997	0.989–1.003	< 0.003	1.65	1.24–3.47
BMI ≥ 25 kg/m2	< 0.002	1.19	1.09–1.95	< 0.001	1.98	1.73–2.62
Teastosterone	0.391	1.002	0.998–1.003	0.421	1.001	0.991–1.002
Age ≥ 35	< 0.001	1.26	1.19–2.78	< 0.001	2.05	1.99–3.35
Atherosclerosis	0.675	0.989	0.891–1.091	< 0.001	1,18	1.12–2.87
Smoking	< 0.01	1.21	1,41- 2.35	< 0.001	2.19	1.98–1.98
Sys Bl.p = Systolic Blood oressure; Dis Bl.p = Diasyolic Blood pressure; HDL = High density lipoprotein;						
Triglycer = Triglycerides; LDL = low density lipoprotein; BMI = Body mass index; Testoste = testosterone						
P value < .05 (statistically significant); NS = not significant; OR = odds ratio;						

Discussion

The International Society of Sexual Medicine's (ISSM)recently proposed a combined definitions[12]. they suggested a precise definition of both LPE and APE; depend on the time starting from penetration to ejaculation, lose the ability to delay ejaculation and negative personal outcomes. Although, APE has a supplementary constituent, the presence of a clinically considerable and frustrating decrease in latency time (often to about 3 minutes or lesser)[4]. This syndrome occurs suddenly or gradually through a patient's life who has normal ejaculation and practices formerly. APE may occur due to the result of urological diseases, vascular dysfunctions and or psychological disorders [11].

Regarding variable premature ejaculation (VPE), the ejaculation time might be a short period or normal. Premature ejaculations are varying and occurs occasionally. The competency to delay ejaculation might be reduced or missing. Premature-like ejaculatory dysfunctions have been defined when the IELT (within

the normal range or may be of longer duration). The ability to postpone ejaculation may be reduced or absent and the belief of early ejaculation or loss of control of ejaculation present. Variable subjective insight of consistent or inconsistent quick ejaculation[4,5]. These definitions are useful in clinical practice since they remarked by different features and may need different methods to manage.[6,7] In the current study, the patients complaining of premature ejaculationswere classified according to the two types of PE and analyzed with different atherosclerosis parameters.

Serefoglu et al.[13] evaluated distributions and related factors in men with premature ejaculations attending outpatients' clinics in Turkey. They observed that the complaints of PE were more intense in patients with APE than with LPE. These findings agreed with the present study (APE was predominant compared with LPE). Gao et al.[4] investigate 3016 men in China between 2011 and 2012 to evaluate the prevalence and factors correlated with PE and the four types of PE syndromes (lifelong, acquired, natural variable and premature-like ejaculatory dysfunction).They reported that 25.8% of patients complained of PE. It was observed that patients with PE were older and more expected to be hypertensive, had more hyperlipidemia and developed a higher body mass index than patients without PE complaint. these findings were similar to that study, where there was a significant difference between PE patients with (elevated blood pressure, hypercholesterolemia Increased BMI and older age) than patients with only PE.

Multiple studies documented those comorbid diseases, like cardiovascular diseases atherosclerosis, hypertension and DM observed to be more likely common in men with the complaint of PE[14]. Nonetheless, it was displayed that among the types of PE, these comorbidities were more obvious in acquired PE, even though the exact etiology of PE is not known[15] .These findings were in agreement with our results, we reported significant differences in blood pressure and lipid profile between the two groups $P < 0.001$.

Hypertension and diabetic Insulin. resistance was found to be associated with sympathetic overactivity, as observed in many patients[16]. Zorba et al [17] evaluated the impact of the autonomic nervous system on [24-hour] heart rate changeability in PE and reported that sympathetic activity was intensified in men with PE, especially the lifelong type.The overactivity in the sympathetic nervous system may produce initial pressure elevation in the male prostatic urethra and subsequent PE.

Xia et al. assessed the potential effect of the sympathetic nervous system function in patients with primary PE by examining the reaction of the sympathetic skin positioned in the male penis and documented that men with primary PE exhibit hyperactive sympathetic nervous system function[18].

Bolat et al. [19] reported that blood pressures were markedly increased in men complaining of PE. About 59% of the premature ejaculator's men showed blood pressure ⩾130/85 mmHg.Correlation analysis exposed that elevated blood pressures showed a negative correlation with IELT.These findings were similar to our results. Where we declared that Bl.P was significantly higher in PE men with atherosclerosis than those without atherosclerosis. ($P < 0.01$)

Recently, Gao et al.[4] established that patients, with acquired PE complaints, displayed elevated body mass index (BMI) scores. These findings are comparable to our results, where BMI, TG, and LDL were statistically significantly greater in PE patients with atherosclerosis than PE patients without atherosclerosis.($P < 0.01$)

Bolat et al .[19] reported also that serum HDL levels were similar between the groups. However,our results showed significant HDL elevation in PE group without atherosclerosis more than PE men with atherosclerosis. ($P < 0.001$).

Conclusions

The current study revealed a definitive correlation between the two types of premature ejaculation (lifelong PE[LPE],acquired PE[APE] in men and atherosclerosis. Oxidative stress, hypoxia, and Ischemia produced by arterial occlusive diseases like atherosclerosis are essential etiologic factors in male sexual dysfunction. Besides, Hypertension and hyperlipidemia reported significantly associated with PE patients with atherosclerosis. BMI revealed a significant elevation in atherosclerosis patients. LPE and APE showed a positive correlation with age, smoking, and BMI.However,men with APE were older and showed significant associations with (systolic Bl.P, Diastolic Bl.P, HDL, LDL, and Triglycerides)

Further studies are necessary to understand specifically the association between atherosclerosis and the development and progress of premature ejaculation.

We recommend that proper management of cardiovascular disease risk factors, like hypertension and hyperlipidemia, may take part in the prevention of atherosclerosis and the subsequent development of PE.

Abbreviations

Premature ejaculation: (PE)

(lifelong PE: [LPE]

acquired PE: [APE]

Arabic index of premature ejaculation: (AIPE)

Body mass index :(BMI)

self-estimated Intravaginal latency time: (IELT)

intima-media thickness: (IMT)

Carotid artery intima-media thickness: (CIMT)

International Society of Sexual Medicine's: (ISSM)

Declarations

Ethics approval and consent to participate:

Research involving human participants and informed written consent was taken.

Author’s contribution:

SS Azab: Study design,Data collection, Manuscript writing MA Farag: writing manuscript

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the data of the present study are available from the corresponding author

Competing interest:

Not applicable

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Figures

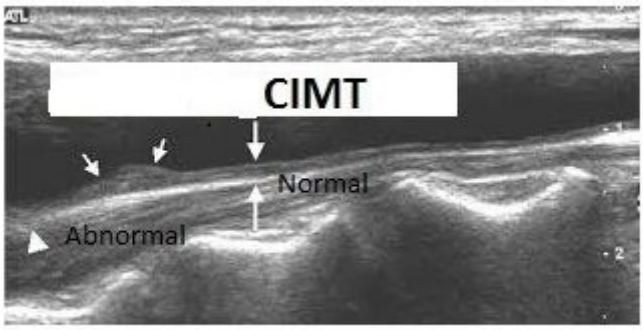

Figure 1

Carotid artery intima-media thickness (CIMT)

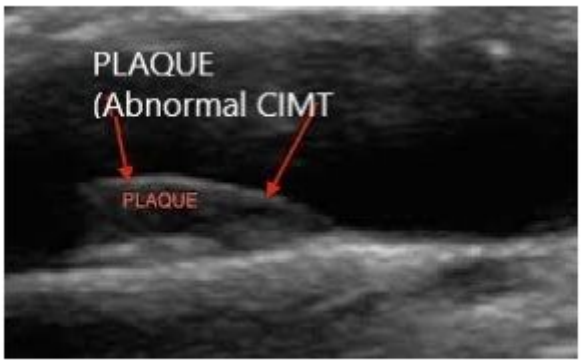

Figure 2

Carotid atherosclerotic plaque