RISK FACTORS IN SEVERE ERECTILE DYSFUNCTION POPULATION

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ABSTRACT

Objectives: *To find the risk factors of severe erectile dysfunction.* ***Material & methods:*** *This Cross sectional study subjects completed the questionnare at the time of diagnosing Erectile Dysfunction (ED). Amount of 297 ED patients with mean age of 49.08 ± 13.69 years were enrolled consecutively at Urology Outpatient Clinic from 2005 to 2012. The questionnaire consisted of marital status, educational status, and occupation, comorbidities, habits, and International Index of Erectile Dysfunction-5 (IIEF-5) questionnare. We compared population proportion of ED severity (severe vs not severe) between sociodemographic, comorbidities and habits group and we also compared the mean of ED onset age and ED duration between those groups.* ***Results:*** *Of the patients, 29.3% were classified as severe ED, and 70.7% were classified other than severe ED (mild, mild-moderate, etc). The median of ED onset age was 47 years (46.64 ± 13.77 years) and the median of ED duration was 52 weeks (126.75 ± 167.69 weeks) ranged from 1 to 1040 weeks. We found status of low education level, unemployed, not married and having diabetes mellitus could increase the risk of having severe ED in ED population with each prevalence ratio was 1.44 (1.12-1.87), 2.02 (1.20-3.42), 1.91 (1.10-3.30), 2.01 (1.30-3.12). Not married group was also found have an earlier mean of ED age onset (mean difference 6.78 (2.37-11.19) years.* ***Conclusion:*** *We found that education level, occupation status, marital status and diabetes mellitus contributes in determining ED severity.*

Key words: *Severe erectile dysfunction, education level, occupation, marital status, diabetes mellitus.*

ABSTRAK

Tujuan: *Mengetahui faktor resiko disfungsi ereksi berat.* ***Bahan & cara:*** *Pada penelitian cross-sectional ini, subjek penelitian mengisi kuesioner pada saat didiagnosis dengan disfungsi ereksi (DE). Pada poliklinik, terdapat 297 pasien DE yang masuk dalam penelitian ini dari tahun 2005-2012 dengan rerata umur pasien sebesar 49.08 ± 13.69 tahun. Kuesioner tersebut berisi tentang status perkawinan, pendidikan, pekerjaan, penyakit komorbid, kebiasaan pasien dan juga kuesioner International Index of Erectile Dysfunction-5 (IIEF-5). Kami membandingkan proporsi kelompok pasien DE derajat berat dengan kelompok pasien DE selain derajat berat berdasarkan karakteristik sosiodemografik, penyakit komorbid dan kebiasaan pasien, serta kami juga membandingkan rerata usia onset terkena DE dan durasi terkena DE berdasarkan karakteristik tersebut.* ***Hasil:*** *Terdapat 29.3% pasien diklasifikasikan menjadi DE derajat berat dan 70.7% pasien diklasifikasikan menjadi DE selain derajat berat (derajat ringan, ringan-sedang, dan sebagainya). Median dari usia onset terkena DE adalah 47 tahun (46.64 ± 13.77 tahun) dan median dari durasi terkena DE adalah 52 minggu (126.75 ± 167.69 minggu) berkisar dari 1-1040 minggu. Penelitian ini menemukan kelompok pendidikan rendah, tidak bekerja, tidak menikah dan diabetes mellitus dapat meningkatkan risiko memiliki DE derajat berat dengan rasio prevalensi masing-masing kelompok adalah sebesar 1.44 (1.12-1.87), 2.02 (1.20-3.42), 1.91 (1.10-3.30), dan 2.01 (1.30-3.12). Pada kelompok tidak menikah, didapatkan usia onset terkena DE yang lebih dini dengan rerata perbedaannya sebesar 6.78 (2.37-11.19) tahun.* ***Simpulan:*** *Tingkat pendidikan, status pekerjaan, perkawinan dan diabetes mellitus berkontribusi dalam menentukan derajat DE.*

Kata Kunci: *Disfungsi ereksi derajat berat, tingkat pendidikan, status pekerjaan, status perkawinan, diabetes mellitus.*

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INTRODUCTION

Male erectile dysfunction (ED) or impotence is the inability to achieve or maintain an erection sufficient for satisfactory sexual performance.[1] It is a common public health problem affecting millions of men in this world.[2] For many men, erectile dysfunction creates mental stress that

affects their interactions with family and associates and also their quality of life.[1,3] There are many studies about the epidemiology, and risk factor of erectile dysfunction. Some studies concluded that prevalence of erectile dysfunction is significantly associated with age, smoking, low socioeconomic status, and several diseases such as diabetes, hypertension, hyperlipidemia, heart disease, other genitourinary disease, depression, and anxiety.[4-8] Several factors (such as marital status, occupation, education level, alcohol consumption) have been studied, but there is still inconsistent conclusion about their association with erectile dysfunction.[9-18] The results vary could be due to culture, ethnic differences, study methodology, target group, etc. From our point of view, Indonesia has unique culture that formal marriage (husband-wife relationship) is mandatory for couple to live together. In many studies, it was found that prevalence of severe erectile dyfunction increased with age.[19-21] Moreira found that the risk factors of severe erectile dysfunction were age, marital status, diabetes mellitus, and depression.[21] In preventing ED to develop to severe ED, it is neccessery to know and manage its risk factors. The aim of this study was to find the risk factor of severe ED in Cipto Mangunkusumo hospital ED population. No previous similiar study was found, so this should be a pilot study.

OBJECTIVE

The aim of this study is to find the risk factors of severe erectile dysfunction.

MATERIAL & METHOD

Amount of 297 ED patients of Urology Outpatient Clinic at Cipto Mangunkusumo National Referral Hospital was enrolled in this cross-sectional study from 2005 to 2012. Subjects could come from various town in Indonesia with referral notes. Subjects of this study were informed and consented to complete the given questionnaire at the time of diagnosing ED. Inclusion criteria were male patients visiting the urology outpatient clinic who were diagnosed with ED. ED is defined in accordance to National Institue of Health (NIH) consensus conference. Any uncompleted questionnaire were excluded and included patients information was kept confidential.

The self-administered questionnaire contained socio-demographic characteristics, duration of ED, The International Index of Erectile Function-5 (IIEF-5), health-related comorbidities, and psychological history. Socio demographic characteristics consisted of age, marital status, educational status (low education level – graduated elementary school or lower class, intermediate education level – graduated junior high school to senior high school, and high education level – had a bachelor degree or higher degree), and occupation (employed, and unemployed). The marital status was classified into two categories ('married' vs 'not married'). Married was consisted of subjects who currently have living partner/wife. 'Not married' was consisted of subjects who were unmarried man, widower or divorced men. By reducing the age of patients with duration of ED, we also get the age of ED onset. The IIEF-5 consists of questions 1–5 for assessing the erectile function. Scoring of the IIEF-5 domain of erectile function allowed classification of each patient as having no ED (22–25), mild ED (17–21), mild to moderate ED (12–16), moderate ED (8-11), and severe ED (5-7).

Comorbidities for ED included hypertension, heart disease, diabetes mellitus, cerebrovascular disease, chronic liver disease, hormonal impairment, kidney function disease, dyslipidemia, vertebrae surgery, prostate surgery, genitalia surgery, hip injury, vertebrae injury, pubic injury, smoking, alcohol abuse, and narcotics abuse.

In obtaining psychological histories, subjects were given questions of “is there any psychological relationship problem with your wife?”, “did your wife frequently refuse to have sexual intercourse?”, “did you frequently argue with your wife?”, “do you still sexually interested to your wife?”, “do you have another sexual partner?”, “do your wife have another sexual partner?”, “do your wife cooperatively support your erectile dysfunction treatment?”, and “do you suffer from severe depression?”.

According to ED definition in National Institutes of Health Consensus Conference, ED is defined as the inability to achieve and maintain an erection sufficient for sexual intercourse.[1] We assessed the severity of ED and the type of ED. We classified ED severity into 2 group (severe vs not severe) to simplify the analysis a risk factor for sever ED. Patients with IIEF-5 score < 8 were classified as severe ED. Based on the etiology, ED was classified into organic, psychogenic, mixed, and other type ED. Organic type ED was diagnosed if someone with ED has one or more health-related comorbidities, ED related medications, abnormal laboratory profile, and abnormal clinical examination.[7]

Psychogenic type ED was diagnosed if someone with ED has psychological problems related to ED.[7] Mixed type ED contained both organic and psychogenic factors.[7] Other type ED was diagnosed if someone with ED doesn't have organic, or psychogenic inclusion criteria.

This study compares the proportion of ED severity (severe vs not severe), mean/median of ED duration, mean/median of ED onset age with groups of identifiable risk factors (ocupation, education level, marital status, comorbidities, etc). We also correlated subjects age with IIEF-5 score. All statistical analyses were conducted using Statistical Package for Social Sciences, version 11.0. (SPSS Inc., Chicago, IL, USA). We used Mann-Whitney test to compare the median of ED onset age and duration of ED from two group of marital status. Chi-Square test was used to analyze the association between marital status with ED severity and type. Spearman test was used to correlate age with IIEF-5 score. P-value < 0.05 was considered to represent significant difference between tested populations.

RESULTS

Table 1 shows distribution of sociodemographic characteristic of the 297 subjects and table 2 shows age adjusted proportion of ED severity.

Table 1. Subjects sociodemographic characteristic.

Sociodemographic characteristic	n (%)	Mean	Median
Age (years)	297 (100%)	49.08 ± 13.69	49 (19-79)
ED duration (weeks)	297 (100%)	126.75 ± 167.69	52 (1-1040)
ED onset age (years)	297 (100%)	46.64 ± 13.77	47 (13-79)
Education level			
Low-middle	126 (42.42%)		
High	171 (57.58%)		
Occupation status			
Employed	251 (84.51%)		
Unemployed	46 (15.49%)		
Marital status			
Married	254 (85.52%)		
Unmarried	43 (14.48%)		
ED severity			
Severe	87 (29.3%)		
Moderate	95 (32%)		
Mild-moderate	67 (22.6%)		
Mild	39 (13.1%)		
Normal/no ED	9 (3%)		
ED type			
Organic	72 (24.2%)		
Psychogenic	55 (18.5%)		
Mixed	146 (49.2%)		
Other	24 (8.1%)		

Table 2. Age adjusted ED severity proportion.

Degree of ED	Number of subjects based on age (%)				
	≤ 40	41 – 50	51 – 60	61 – 70	≥ 71
Severe	23.9	27.4	28.1	38.2	46.2
Moderate	34.8	30.1	26.6	34.5	38.5
Mild – moderate	25.0	21.9	29.7	14.5	7.7
Mild	12.0	17.8	10.9	12.7	7.7
No ED	4.3	2.7	4.7	0	0
Number of subjects	92	73	64	55	13

Table 3. Proportion of ED patients according to > 60 years and ≤ 60 years and its association with ED severity.

Age	IIEF-5 results		Prevalence ratio	p
	Severe	Not severe		
> 60 years	27	41	1.58 (1.04-2.41)	0.035*
= 60 years	60	169		

Table 4. Proportion of the ED patients according to level of education, occupation, marital status, and their association with ED severity.

Socio-demographic characteristic		N	ED severity (n)		Prevalence ratio	p
			Severe	Not severe		
Education Level	Low-middle	126	47	79	1.448 (1.12-1.87)	0.010*
	High	171	40	131		
Occupation	Unemployed	46	21	25	2.02 (1.20-3.42)	0.013*
	Employed	251	66	185		
Married	No	43	19	24	1.91 (1.10-3.30)	0.029*
	Yes	254	68	186		

*Chi-Square test

Table 5. Proportion of the ED patients according to level of comorbidities, habits, medication history and their association with ED severity.

Comorbidities, habits		N	ED severity (n)		Prevalence ratio	p
			Severe	Not severe		
Hypertension	Yes	67	22	45	1.24	0.413*
	No	230	65	165		
Heart disease	Yes	36	10	26	1.00	0.831*
	No	261	77	184		
Diabetes Mellitus	Yes	63	28	35	2.01 (1.30-3.12)	0.003*
	No	234	59	175		
Smoking	Yes	61	19	42	1.11	0.721*
	No	236	68	168		

*Chi-Square test

Table 6. Other comorbidities and habits.

	Number of subjects	%
Comorbidities		
Cerebrovascular disease	12	4.0
Chronic liver disease	1	0.3
Hormonal disorder	15	5.0
Kidney function disease	15	5.0
Dyslipidemia	12	4.0
Pelvic injury	3	1.0
Vertebrae injury	6	2.0
Prostate surgery	6	2.0
Genitalia surgery	8	2.7
Vertebral surgery	1	0.3
Habits		
Alcohol abuse	5	1.7
Narcotics abuse	0	0

We found no significant correlation ratio between age with IIEF-5 score and ED duration ($p > 0.05$). In table 3, we categorized age variable into '> 60 years' vs '≤ 60 years' and we found significant proportion difference in ED severity (severe vs not severe).

Table 4, 5, and 6 show the proportion of ED patients according to sociodemographic characteristic, comorbidities, medication history and their association with ED severity. Comorbidities (stroke, cerebrovascular disease, etc), and habits (alcohol, narcotics abuse) that had few subjects value was not included into analysis.

In this study, ED duration and ED age onset have an abnormal distribution data (Shapiro-Wilk test with p value < 0.05). Their association with socio-demographic characteristic, comorbidities and habits could be seen on table 7 and 8.

Table 7. Association between sociodemographic characteristic, comorbidities, and habits with age of ED onset.

Sociodemographic characteristic, comorbidities, habits		ED onset age mean in years (95% CI)	ED onset age median (years)	Mean difference (years)	p
Education level	Low-middle	46.17 (43.74-48,60)	45.00	0.82	0.505*
	High	46.99 (44.91-49.08)	47.23		
Occupation	Unemployed	57.8 (54.17-61.43)	59.38	13.21	< 0.001*
	Employed	44.59 (42.97-46.22)	44.50	(9.13-17.29)	
Married	Yes	47.62 (46.02-49.22)	47.85	6.78	0.005*
	No	40.84 (35.62-46.07)	37.31	(2.37-11.19)	
Hypertension	Yes	55.09 (52.46-57.95)	57.00	10.91	< 0.001*
	No	44.18 (42.41-45,94)	43.85	(7.36-14.46)	
Heart Disease	Yes	57.31 (53.93-61.31)	58.77	12.09	< 0.001*
	No	45.22 (43.48-46.79)	44.81	(7.40-16.78)	
Diabetes Mellitus	Yes	53.18 (50.56-56.16)	53.00	8.3	< 0.001*
	No	44.88 (43.00-46.61)	43.96	(4.57-12.03)	
Smoking	Yes	44.02 (40.78-47.25)	44.00	3.20	0.143*
	No	47.22 (45.41-49.03)	47.23		

*Mann-Whitney test

Table 8. Association between sociodemographic characteristic, comorbidities, and habits with ED duration.

Sociodemographic characteristic, comorbidities, habits		Mean duration of ED in weeks (95% CI)	Median duration of ED (weeks)	Mean difference (weeks)	p
Education level	Low-middle	133.29 (101.74-164.84)	52.00	12.44	0.313*
	High	120.85 (96.55-145.15)	52.00		
Occupation	Unemployed	163.04 (102.68-223.39)	104.00	42.94	0.117*
	Employed	120.10 (100.22-139.98)	52.00		
Married	Yes	121.66 (100.39-142.94)	52.0	35.15	0.018*
	No	156.81 (114.95-198.67)	144.0	(-89.51 - +19.21)	
Hypertension	Yes	134.64 (96.08-173.19)	83.50	10.76	0.121*
	No	123.88 (101.54-146.22)	52.00		
Heart Disease	Yes	132.70 (97.54-159.16)	104.00	6.77	0.016*
	No	125.95 (104.46-147.44)	52.00	(-66.26 -+52.72)	
Diabetes Mellitus	Yes	151.73 (106.24-197.33)	104.00	31.42	0.038*
	No	120.03 (98.21-140.85)	52.00	(-78.20 - +15.36)	
Smoking	Yes	126.79 (81.30-172.28)	52.00	0.71	0.999*
	No	126. 08 (104.65-147.52)	52.00		

*Mann-Whitney test

DISCUSSION

The mean age of ED patients in this study was 49.08 ± 13.69 years ranged from 19-79 years, it was different with Nabil S et al study that the mean age of ED patient in Jeddah city was 43.23 ± 12.56 years ranged from 20-86.[22] In Slag and Kattan study, the mean age of ED patients in Minneapolis city was 59.4 years and in Riyadh city was 52.6 years.[23,24] According to Nabil study results, The mean age of ED onset was 39.57 ± 12.44 years and the mean of ED duration was 3.5 ± 5.1 years.[22] This difference could be caused by different characteristic and comorbidities characteristics. In this study, mixed type erectile dysfunction was the most common type. In Masters and Johnson study, the most common type erectile dysfunction in their study was psychogenic type.[7]

Based on distribution of age adjusted ED severity proportion, there was a rising proportion

precentage of severe ED as the older the subjects. This result was appropriate Lyngdorf study in Denmark and also Massachusetts Male Aging Study (MMAS) in Boston and nearby city from 1987 to 1989 that the prevalence of complete impotence was increased (tripled from 5 to 15%) between the subject ages 40 and 70 years.[3,25,26] In Taher A study about andropause patients in Jakarta, the rise in age increase the prevalence of having andropause.[27] We try to link the causal relationship between andropause and impotence. Deficiency of testosterone (andropause) will affect the production of nitric oxide synthase which is essential in erection mechanism.[7] That decreasing production of testosteron along with increasing age, the natural erection mechanism that depends on testosteron will be affected so that it will increase prevalence of erectile dysfunction. Although this study found no significant correlation ratio between age and IIEF-5 score, there was significant severity ED proportion difference between group of > 60 years old and ≤ 60 years old. From this data, age > 60 years could be a risk in having severe ED in ED patients.

In this cross sectional study, we found status of low education level, unemployed, not married and having diabetes mellitus also could contribute in having severe ED in this ED population. But we found no significant difference in hypertension, heart disease, smoking habit group, etc. Low education level was found could increase the prevalence of having severe ED in Safarijenad study and Lyngdorf study.[2,4,26] Lack of sexual knowledge was also one of the risk factor of having ED.[1]

Previous study showed inconsistent results between marital status with ED prevalence or incidence. Shiri et al found no differences in the incidence of ED by the level of marital status, so did Johannes et al in Massachusetts.[5,14] Martins et al in Brazil, and Cho et al in Korea found that marital status was not associated with ED prevalence.[6,16] But in other studies, Grover et al found that marital status was significantly associated with erectile dysfunction prevalence.[17] Safarinejad found that unmarried men were roughly 1.8 times more likely to have ED than married men (95% CI, 1.3 – 2.5) in comparison with married men.[2] Unmarried men were associated with elevated risk of having low sexual desire.[10,11] Sexual desire or psychological (visual, olfactory, imaginative) stimulation was needed in initiating and maintaining erectile dysfunction in supraspinal system.[1,7]

From this study, there is a increased likelihood to have a severe ED in 'not married' group, this result was appropriate to Shaeer study result that men who were separated, divorced, or widowed were three times more likely to have moderate-to-severe ED (OR 5.12 (2.91-9.03)) than men who were married or who lived with partner.[18] Besides, subjects who have wife or living partner will have better medical help-seeking pattern.[28]

In this study, diabetes mellitus was found could increase the risk of having severe ED, this results was appropriate with nicolosi study and Shiri study results.[4] Hypertension, heart disease and smoking habits had been known to be risk factor for having ED, but in this study those factors weren't included to be risk factors for having severe ED.[1,4,5,19,25] The cause of these results could be the smaller number of this study sample than other study. Other comorbidities and habits data (cerebro-vascular disease, chronic liver disease, etc) were also taken, but they had only few subjects number of each group and we didn't analyzed them.

According to mean of ED onset age data (table 5), employed or 'not married' or having hypertension/heart disease/diabetes mellitus groups had older mean of ED onset age. We found no previous study concerning about ED onset age and ED duration. Not married was thought could be a risk factor of developing earlier ED, but it still need a further study to prove it and this ED onset age data was an inaccurate data that ED onset age were achieved from patients' age reduced by ED duration (filled subjectively by patients). From table 6, we found not married group had a longer ED duration mean. The shorter duration of ED in married group could be caused by wife role in increasing quality of life or family and also in treatment-seeking patterns.

This cross sectional study could not find the causal relationship between those variables. Other prospective study should be done to find the causal relationship. Factors that was found could increase the risk of having severe ED were low education level, unemployed, not married and having diabetes mellitus. Better understanding of ED epidemiology is important in planning preventive strategies and treatment of ED.

CONCLUSION

Education level, occupation status, marital status and diabetes mellitus could contribute in determining ED severity in ED population.

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