Correlation between Risk Factors and Pelvic Organ Prolapse in Gynecology Outpatient Clinic, Dr. Soetomo Hospital Surabaya, 2007 – 2011

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ABSTRACT

*Pelvic organ prolapse (POP) results in protrusion of the vagina, uterus, or both, and present in more than 50% of women population. The incidence markedly increases with advancing age. One strategy to prevent POP is to predict its probabilities from the risk factors. This study was to explore correlation betweens risk factors and POP presence in gynecology outpatient clinic, Dr. Soetomo Hospital Surabaya 2007 – 2011. This was a 5-year retrospective observational study. Data were collected from medical records in gynecology outpatients clinic Dr Soetomo Hospital. We used consecutively sampling technique and regression logistic test to analyze the strength between risk factors and POP presence and development. Regression equation model was used to predict probability of developing POP. There were 371 women with POP, but only 92 become samples of this study based on 4 risk factors (parity, age, menopausal condition, and Body Mass Index or BMI). The major types of POP were uterine prolapse (66.3%) at stage III (60.66%) and IV(31.15%). Correlation coeficient value between risk factors and POP presence was 0.702 (p<0.05) with only 3 risk factors significantly become POP predictor, e.g parity, age, and menopausal condition. Further analysis revealed regression equation model consisting three predicting factors with predictor coefficient values: parity (1.357), menopausal condition (1,023), age (0.785), and the constanta (-1.679). In conclusion, parity, menopausal condition, and age are predictor factors to determine the probabilities in developing POP.(**MOG 2013;21:61-66**)*

Keyword: *Risk factor of POP, logistic regression equation model*

ABSTRAK

*Prolaps organ pelvis(POP) menyebabkan penonjolan vagina, rahim, atau keduanya, dan terdapat pada lebih dari 50% populasi wanita. Kejadiannya meningkat dengan bertambahnya usia. Salah satu strategi mencegah POP adalah memprediksi probabilitas dari faktor risiko. Penelitian ini mengeksplorasi hubungan antara faktor risiko dan kehadiran POP di klinik rawat jalan ginekologi, RSUD Dr. Soetomo Surabaya 2007-2011. Penelitian ini merupakan studi observasional retrospektif 5 tahun. Data dikumpulkan dari catatan medis pasien klinik rawat jalan ginekologi RSUD DrSoetomo. Kami menggunakan teknik sampling dan uji regresi logistik untuk menganalisis kekuatan antara faktor risiko dan keberadaan serta perkembangan POP. Model persamaan regresi digunakan untuk memprediksi kemungkinan perkembangan POP. Ada 371 wanita dengan POP, tetapi hanya 92 menjadi sampel penelitian ini berdasarkan 4 faktor risiko (paritas, usia, kondisi menopause, dan Body Mass Index atau BMI). Jenis utama dari POP adalah prolaps rahim (66,3%) pada tahap III (60,66%) dan IV (31,15%). Nilai koefisien korelasi antara faktor risiko dan kehadiran POP adalah 0,702 (p <0,05) dengan hanya 3 faktor risiko menjadi prediktor signifikan POP, misalnya paritas, usia, dan kondisi menopause. Analisis lebih lanjut dengan persamaan model regresi mengungkap tiga faktor dengan nilai koefisien prediktor: paritas (1,357), kondisi menopause (1.023), usia (0,785), dan konstanta (-1,679). Sebagai kesimpulan, paritas, kondisi menopause, dan usia merupakan faktor prediktor untuk menentukan probabilitas perkembangan POP.(**MOG 2013;21:61-66**)*

Kata Kunci: *faktor risiko POP, model persamaan regresi logistik*

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INTRODUCTION

Pelvic organ prolapse (POP) also called urogenital prolapse or genital prolapse, or uterovaginal prolapse, is downward descent of female pelvic organs, including the bladder, uterus or post-hysterectomyvaginal cuff, and the small or large bowel, resulting in protrusion of the vagina, uterus, or both. Based on epidemiological studies, this pelvic floor disorder present more than 50% of women population, especially at 5th and 6th decade of life, and the incidence markedly increased with advancing age. In the Women's Health Initiative, 41% of women age 50–79 years showed some amount of pelvic organ prolapse. Since there are increasing quality of health services and women life expectancy, the population number of women will increase as well. Thirty years later, it will predict that there are many women aged above 50 years.This condition contribute

to increase problem related to pelvic disorder and result a higher cost than before. In USA, more than 225 000 inpatient surgicalprocedures for pelvic organ prolapse were undertaken and estimated cost of its more than US$1 billion in 1997.

POP development is multifactorial, which are combine effect of several factors and resulting many variation among population. According the expert, it is better for understanding risk factors of POP divided into 2 kind of groups,demographic and obstetric-gynecologic. Demographic factors include age, race and ethnical origin, increasing BMI (obesity), menopausal condition and genetic. Since obstetric-gynecologic factors is shown an established and potensial factors for POP, it was proofed that parity and vaginal child-birth, instrumentally vaginal delivery, prolonged 2nd stage of labor, and hysterectomy play the consistent role for development of POP. Another factors such aschronic straining, and abnormalities of connective tissue orconnective-tissue repair predispose some women to disruption, stretching, or dysfunction of the levator ani complex,connective-tissue attachments of the vagina, or both, and hormonal imbalanced were potential resulting in POP.

Potential approaches include lifestyle changes that reduce modifiable risk factors, suchas weight loss, avoidance of heavy-lifting occupations, andtreatment of constipation. Unfortunately, as far as weknow, no studies have been done to assess these changes for anything similar. Modification or reduction of obstetric risk factors also offers the potential to prevent subsequent POP. Similar to lifestyle changes, much moreevidence is needed in this area. Some researchers haveadvocated for elective caesarean section as a wayto reducerisk of subsequent pelvic organ prolapse.Although, it rarely results in severe morbidity ormortality,but it causes symptoms of the lower genital,urinary, and gastrointestinal tracts that can affect awoman's daily activities and quality of life.For those reason above, the preventive strategy must be effort to resolve that problem. One of the strategy is to predict the probabilities of POP from the established risk factors, so the preventive prosedure could be obtained sooner. However, until specific criteria allow providers to ascertain who would and would not benefit from this intervention, it is unlikely to become an effective strategy for prevention. Anotherpotential preventive approach is maintenance or improvement of pelvic-floor muscle strength via a physicaltherapy (Kegal exercise) programme. Kegal exercises arean effective treatment. To fulfill expectancy above, we conducted a study for understanding how strength the correlation between risk factors and POP presence, and their contribution in the development of POP. The result furthermore, arranged a regression equation model utilized to predict how greater probability of thewoman with any risk factors might be able to develop POP.

MATERIALS AND METHODS

This study designed is observasional-analityc with retrospective approach. Datacollected from medical records of POP patients in gynnecology outpatients clinic Soetomo Hospital for 5 years from January 2007 until December 2011, with consecutively sampling technique and utilized inclusion and exclusion criterias. The inclusion criterias are all patients data diagnosed POP from medical report consist of anamnesis, physical examniation, diagnose, and advised therapy completely, especially related to demographic and/or obstetric-gynecologic factors that contribute in the development of POP. The exclution criterias are POP patients with additional diagnosis that influenced the severity of POP such as benign tumor or malignancy of external and/or internal genitalia e.g carcinoma cervix, myoma uteri and others. Another exclusion criteria are congenital disorder of external and/or internal genitalia, and the pregnant POP patient. We also want to know what kinds of risk factors that effect on the presence of POP and how strength correlation between those contributing variables. After identifiying characteristics of risk factors, we conducted a regression logistic test (95% CI and level of significance $p<0.05$) for analyze correlation and their contribution in the development of POP. At last, we arranged regression equation model utilized to predict how greater probability of the woman with any risk factors might be able to develop POP.

Table 1. Distribution of type of POP patients

Diagnose	N	(%)
Uterine prolapse	61	66.30
Vesicocele	6	6.52
Rectocele	0	0.00
Vesicocele + Rektocele	1	1.09
Uterine prolapse+ Varikokel	13	14.13
Uterine prolapse + Rektokel	1	1.09
Uterine prolapse + Vesikokel + Rektokel	8	8.70
Uterine prolapse + Vesikokel + Urethrokel	1	1.09
Vault vagina prolapse	1	1.09
Total	92	100.00

RESULTS AND DISCUSSION

There have been 371 patients registered as POP patientsin gynecology outpatient clinic Soetomo Hospital for 5 years, but only 147 data we can find from

medical record. Two hundreds twenty two data were not qualified and only 92 data become a sample based on inclution and exclution criterias.

From 92 sample, we found that 61 cases (66.3%) of uterine prolapse, 6 cases (6.52%) of vesicocele, 25 cases (26.1%) of combination POP, and no cases of rectocele (see table 1 below). We recognized that more than 90% cases uterine prolapse as stage III and IV, 37 cases (60.66%) as stage III, 19 cases (31,15%)as stage IV, 5 cases (8,20%) stage II and no cases found as stage I (table2.).

We also identified that only 4 risk factors established in POP development including parity, menopausal condition, age and BMI. From these risk factors we found that POP developed mostly at periode of age 60-70 years (32 cases) with approximately average age 58,5 ± 10,54 years (table 3). It seems that POP tend to occur at mothers parity more than 6 (42 cases), with average about 4.89 ± 2.69 years. If it was categorized become 2 groups parity e.g parity < 4 and ≥ 4, we calculated 37 and 55 cases as a parity < 4 and ≥ 4, respectively (table 5).

Table 2. Distribution of stage of POP

Stage	n	(%)
Uterine prolapse I	0	0,00
Uterine prolapse II	5	8,20
Uterine prolapseIII	37	60,66
Uterine prolapseIV	19	31,15
Total	61	100,00

Distribution of risk factor that responsible for POP, are shown in tables below. There are 4 risk factors that responsible for presence of POP e.g parity, menstrual conditional, age, and BMI.

Table 3. Distribution of Stage of POP patient

Type	Age (years)					Sum
	30-40	40-50	50-60	60-70	>70	
Uterine prolapse	4	4	14	32	7	61
Vesicocele	2	0	2	1	1	6
Rectocele	0	0	0	0	0	0
Vesicocele+Rektocele	1	0	0	0	0	1
Uterine prolapse+Vesikokel	1	1	3	5	3	13
Uterine prolapse+Rektokel	0	0	1	0	0	1
Uterine prolapse+Vesikokel+Rektokel	0	1	3	2	2	8
Uterine prolapse+Vesikokel+Urethrokel	0	0	0	1	0	1
Vault vagina prolapse	0	1	0	0	0	1
Total	8	7	23	41	13	92

Table 4. Distribution of POP patients based on parity

Type	Parity							Sum
	0	1	2	3	4	5	> 5	
Uterine prolapse	2	4	7	13	4	3	28	61
Vesicocele	0	1	0	2	1	1	1	6
Rectocele	0	0	0	0	0	0	0	0
Vesicocele+Rektocele	0	0	0	0	0	0	1	1
Uterine prolapse+Vesikokel	0	0	1	4	0	2	6	13
Uterine prolapse+Rektokel	1	0	0	0	0	0	0	1
Uterine prolapse+Vesikokel+Rektokel	0	0	1	1	1	1	4	8
Uterine prolapse+Vesikokel+Urethrokel	0	0	0	0	0	0	1	1
Vault vagina prolapse	0	0	0	0	1	0	0	1
Total	3	5	9	20	7	7	41	92

Tabel 5. Risk factors of POP cateogorized by parity and age

Parity	n	%	Age (years)	n	%
< 4	37	40.22	< 60	35	38,04
≥ 4	55	59.78	≥ 60	57	61,96
Count	92	100	Count	92	100.00

Tabel 6. Risk factors of POP patients cateogorizedby Menopausal condition and BMI

Menopausal condition	n	%	BMI (kg/m^2)	n	%
Yes	79	85,87	< 30	78	84,78
No	13	14,13	≥ 30	14	15,22
Count	92	100,00	Count	92	100,00

Table 7. Statistical results for risk factors

Variabel	b	p	r
Age	0.785	0.046	
Parity	1.357	0.015	
Menopausal condition	1.023	0.024	0,702
BMI	0.092	0.943	
Konstanta	-1,679		

Furthermore, we performed regression logistic test to analyze how strength correlation between risk factors and POP presence, and to arrange regression equation model for predictinghow greater probability of woman with any risk factors might be able to develop POP. Statistical analysis results there are significant correlation ($r = 0.702$, $p < 0.05$) between risk factors (parity, menopausal condition, and age), and POP presence, but not for BMI. It mean that parity, menopausal condition, and age are predictor ($p < 0,05$),for POP presence. At last, we formulated an regression logistic equation model:

$$Y = \frac{1}{1 + Exp\,[-(0{,}785.X_1 + 1{,}357.X_2 + 1{,}023.X_3 - 1{,}679)]}$$

Y : Dependent variableor POP Presence
X1 : Predictor 1 or age (0 for< 60 th, 1 for ≥ 60 th)
X2 : Predictor 2 or Parity (0 for parity < 4,
1 for parity ≥ 4)
X3 : Predictor 3 or menopause condition
(0 for menopause (-),1 for menopause (+)

Epidemiologically, POP occur more than 50% of women population, especially on 5th – 6th decade of live, and advancing with additional age. Etiology of POP is multifactorial, which is combine effect of more than 1 factors with many variation among subject. In Indonesia, until now there is no single details data documented completely. The exact insidenceof POP is hard to find. Parturition women have 50% probabilities and 20% of postoperation of gynecology cases had developed POP. Many study reported POP presence range from 65 cases to 240 cases in 1970 – 2000. Most of that cases are uterine prolapse, and occur at aged 60-70 years.

Data collected retrospectively on gynecology outpatients clinic Soetomo Hospital for 5 years between 2007 until 2011 shows that there were totally 371 patients documented as POP patients. After selecting, only 92 patients qualified for further analysis. Uterine prolapse is frequent cases of POP. There are 61 cases or approximately 66%. These result is similar with POP patients in dr. Jamil Hospital - Padang 1993-1998 about 94 cases. Another results reported similiarly such as 65 cases in dr. Pingardi Hospital - Medan 1968-1970, 43 cases in dr. Mohammad Hosein – Palembang Hospital 1999-2003, and 186 cases in dr. Cipto Mangunkusumo Hospital (RSCM) – Jakarta 1995-2000.

Based on age as risk factors, we found average age of POP first complained 58,5 ± 10,54 years. This results isn't too different with another study e.g in Mohammad Hosein Hospital –Palembang, most cases (65.12%) occur on aged 45-64 year, in dr. Jamil Hospital - Padang 21.56% occur on age > 50 years, and in RSCM Jakarta on aged 60-70 years. According to Jelovsek et al (2007), the incidence and prevalence of POP increasing with advancing age, relative prevalence increased about 40% every additional decade of life, and women aged 60-79 years had higher risk of POP than women aged 50-59 years.

According to Junizaf (2007), POP occur frequently on women that had vaginal birth more than 3 times. In this study, we found that POP occur frequently on parity ≥ 5 or grande multipara about 44,6%, with average approximately 4,89 ± 2,69. This results does not too different with many study which found POP frequently on parity more than 4. For instance, in M. Jamil Hospital –PadangPOP often occur on grande multipara about 40,03% and in Mohammad Hoesin Hospital - Palembangabout 47,44%. If stage of POP we explored, we found that more than 90% at stage III (60.66) and IV (31.15%). It is similar in M. Hoesin Hospital – Palembang, which is POP presence mostly at stage III (76.74%), and in M. Jamil Hospital - Padang stage III about 70,12%.

At last, we counted 76 (85.87%) cases had menopause before symptoms and/or sign of POP occurred, and 13 cases (14.13%)had not, withaverage age about 12,71 ± 6,83 years. It is higher than found only 76,05%in Mohammad Hoesin Hospital – Palembang. In this study we also figure out that mostlyPOP occurs 6-10 years before menopause. After menopause, estrogen level dropped to lowest level in the circulation. As we known that estrogen roled to maintain function of connective tissues of the body. Microscopically, decreased estrogen level would be increased a number of Collagen III, and decreased ratio collagen I/III. So its decreased strengthness and elasticity of subepitel vagina tissue, uterosacral and cardinale ligament. This conditions at the ends will responsible for development of pelvic floor disorder.

From statistical analysis result there were only 3 risks factors significanly proofed as predictor for estimation of probabilities on POP presence such as parity, age and menopausal condition, but not for BMI. This result could be happened naturally in statistical point of view, because the number of obesity patiens calculated relatively small than number of another risk factor, 14 cases (15,22%) combined 55 cases (59,78%) of parity ≥ 4, 57 cases (61,96%) of age ≥ 60 years, and 79 cases (85,87%) of menopause condition. After all, we proofed from statistical analysis with regression logistic test that correlation between risk factors i.e parity, age and menopausal condition and POP presence are significantly strong enough ($p < 0.05$) becausevalue of regression coeficient (r) equal to

0.702. It means that parity, age and menopausal condition could be used as predictor for estimation of possibilities POP presence in women.

CONCLUSION

This study concluded that correlation between risk factorsand POP presence was significantly strong enough ($r = 0.702$; $p<0.05$) with parity, menopausal condition, and age were a predictor factors in regression equation models to detemine the probabilities of the woman with any risk factors might be able to develop POP.

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