Original Article/นิพนธ์ต้นฉบับ

Assessment of Prolapse Using the S-POP by the First-Year-OB&GYN Resident Trainees

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Abstract

Background: The pelvic organ prolapse quantification system (POP-Q) is a relatively complex and it is often interpreted as being difficult to learn. An international committee devised a simplified version of the POP-Q (S-POP) classification system that retained the ordinal stages of the POP-Q system but simplified the terminology and reduced the number of points measured.

Objective: To determine the correlation between POP-Q and simplified version of POP-Q (S-POP) in patients examined by urogynecologists and first-year-obstetrics and gynaecology (OB&GYN) residents, respectively.

Methods: A cross-sectional study was conducted in 100 subjects with or without symptoms of pelvic floor disorder, attending the Urogynecology Clinic at Ramathibodi Hospital. Subjects underwent two separate pelvic examinations at that visit; POP-Q examination by urogynecologists, and S-POP examination by the first-year-OB&GYN residents. The ordinal stages from each segment were recorded and the intersystem agreement was evaluated using kappa analysis.

Results: According to the POP-Q system, pelvic organ prolapse overall stage I, II, III and IV were demonstrated in 8%, 54%, 27% and 11%, respectively. Regarding the intersystem agreement, kappa statistics for overall stage was 0.77, for the anterior vaginal wall was 0.79, for the posterior vaginal wall was 0.78, for the cervix was 0.73, and for the vaginal cuff was 0.56.

Conclusions: There was substantial agreement between the POP-Q examination by urogynecologists and the S-POP examination by first-year-OB&GYN residents.

Keywords: Pelvic organ prolapse, Simplified pelvic organ prolapse quantification system, Pelvic organ prolapse quantification system

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Introduction

In 1996, an international committee published a document describing the pelvic organ prolapse quantification system (POP-Q)[1] which was reviewed and adopted by the International Continence Society (ICS), American Urogynecologic Society (AUGS), and the Society of Gynecologic Surgeons (SGS). The POP-Q system gained the attention of specialists all over the world and it is currently the most commonly used system by urogynecologists for reporting pelvic organ support defects.[2, 3] Previous studies reported that 75% of surveyed members of AUGS and ICS are using the POP-Q[4] while only 47% articles in the peer-reviewed literature used the POPQ system.[5] The advantages of the POP-Q are that it is a very specific and objective in describing pelvic organ prolapse. However, the POP-Q is a relatively complex system and it is often interpreted as being difficult to learn and incorporate into daily practice. While the POP-Q system has become the scientific standard, there is less acceptance of the system outside of the field of urogynecology. Therefore, the International Urogynecological Association (IUGA) Standardization of the Terminology Committee devised a simplified version of the POP-Q (S-POP) classification system that retained the ordinal stages of the POP-Q system but simplified the terminology and reduced the number of points measured. In 2011, a multi-center study among urogynecologists in Brazil, Denmark, Argentina and Thailand showed good inter-system association between the S-POP and POP-Q.[6] In addition, the S-POP demonstrated good inter-examiner agreement across twelve centers from four continents in a separate study.[7] In order to recommend the S-POP for generalists it needs to demonstrate equivalence or close correlation with the POP-Q. This then would allow the generalist performing an S-POP in their clinic to benefit from research using the POP-Q staging system. To date, there is no study that compares S-POP examination results by practitioners naive to the POP-Q with POP-Q examination results by urogynecologists.

The aim of this study was to determine the correlation between the POP-Q examination results as recorded by urogynecologists and the S-POP examination results as recorded by the first-year-obstetrics and gynaecology (OB&GYN) resident trainees.

Methods

This was an observational study involving women aged 18 and older. This study was approved by the Ethics Committee of Faculty of Medicine Ramathibodi Hospital, Mahidol University, No. MURA2011/134; and informed consents had been obtained from all participants before entering the study.

The recruitment period was from April 2011 through January 2012. Inclusion criteria were women with or without symptoms of pelvic floor disorder, attending the Urogynecology Clinic at Ramathibodi Hospital. All subjects had to be healthy enough to perform Valsalva or cough and be willing to undergo two pelvic examinations in the same visit. Exclusion criteria were pregnancy or within 6 weeks postpartum, women who refused to undergo a second examination or women who could not tolerate being in the lithotomy position for any reason. After written informed consent was obtained, the subjects were asked to empty their bladder and then underwent the pelvic examination in the lithotomy position. All POP-Q examiners were urogynecologists who use POP-Q routinely in their clinics. All the S-POP examiners were first-year residents who are not familiar with the POP-Q system. Prior to the study, the first year residents were instructed to review a video describing the S-POP examination and examine patients under the urogynecologist's (J.M.) supervision. Once the first year residents demonstrated competency in the S-POP examination they were allowed to take part as an examiner. Competency in performing a S-POP examination was determined by having the first year residents perform examinations repeatedly until the inter-rater agreement assessments using kappa (κ) statistics demonstrated strong agreement ($\kappa > 0.8$) among the

residents own examinations and between themselves and the supervising urogynecologist.

For the POP-Q exam, the nine standard measures were taken in centimeters in the standard fashion previously described.[1] The hymen is the fixed point of reference used throughout this system of quantitative prolapse description. Six points (two on the anterior vaginal wall [Aa and Ba], two in the superior vagina [C and D], and two on the posterior vaginal wall [Ap and Bp]) are located with reference to the plane of the hymen (Figure 1). The genital hiatus is measured from the middle of the external urethral meatus to the posterior midline hymen. The perineal body is measured from the posterior margin of the genital hiatus to the midanal opening. Measurements of the genital hiatus and perineal body are expressed in centimeters. The total vaginal length is the greatest depth of the vagina in centimeters.[1] In order to define vaginal segmental stages, to compare with the S-POP examination results, following the POP-Q exam, each vaginal segment was given an ordinal stage using the following criteria:[7] 1) The anterior vaginal segment was staged using point Ba; 2) The posterior vaginal segment was staged using point Bp; 3) The cervix was staged using point C; 4) The apex/posterior fornix was staged by using point D in the non-hysterectomized patient and point C in the hysterectomized patient.

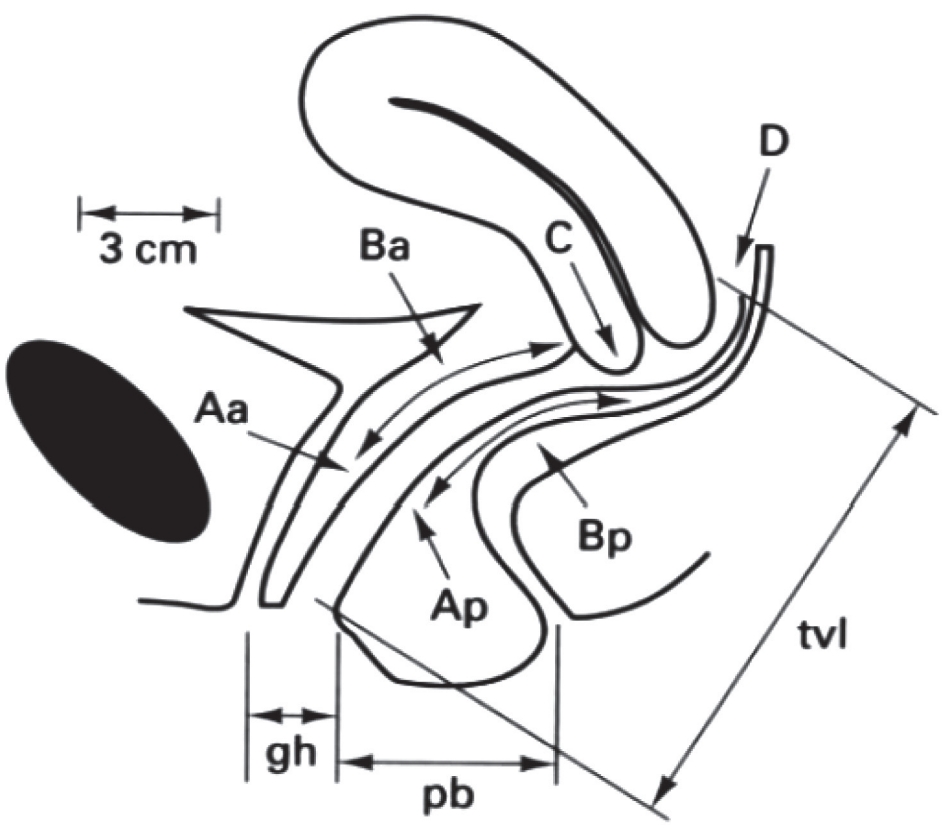

Figure 1 *The POP-Q System*

Aa indicates anterior vaginal wall; Ap, posterior vaginal wall; Ba, anterior vaginal wall; Bp, posterior vaginal wall; C, cervix or cuff; D, posterior fornix; gh, genital hiatus; pb, perineal body; tvl, total vaginal length.

For the S-POP, the four areas examined included the anterior and posterior vaginal walls, the apex, and the cervix. If a subject had previous hysterectomy, then only vaginal walls and the cuff scar/apex were examined. No measuring devices were required for the S-POP, and the investigators had to use estimates for identifying those points on the anterior and posterior vaginal segments that were used to represent the respective walls. For examination of the anterior vaginal segment, the speculum was placed into the vagina and the posterior vaginal wall was retracted to allow for full visualization of the anterior vaginal wall. A point or fold approximately halfway up the anterior vaginal wall or approximately 3 cm proximal to the urethral meatus/hymenal remnants was identified. The subject was then instructed to Valsalva or cough in a forceful fashion, and where that point descended in relation to the hymenal remnants was recorded as the ordinal stage of the anterior vaginal wall. The posterior segment was examined in a similar fashion. The point chosen to represent the posterior vaginal segments was identified in a similar fashion, except that the point was approximately halfway up the posterior vaginal wall or approximately 3 cm proximal to the hymenal remnants. The cervix was evaluated by placing a disarticulated Graves speculum in the vagina, and directly observing its descent during a Valsalva or cough. Then the stage of the cervix was determined in relation to the hymenal remnants. The vaginal apex or cuff scar was visualized in a similar fashion. If the cervix, apex, or cuff scar went beyond the hymenal remnants with Valsalva or cough, then a speculum was not employed during their evaluation.

The staging system for each segment is:

Stage I: Prolapse where the given point remains at least 1 cm above of the hymenal remnants.

Stage II: Prolapse where the given point descends to the introitus, defined as an area extending from 1 cm above to 1 cm below the hymenal remnants.

Stage III: Prolapse where the given point descends greater than 1 cm past the hymenal remnants, but does not represent complete vaginal vault eversion or complete procidentia uteri. This implies that at least some portion of the vaginal mucosa is not everted.

Stage IV: Complete vaginal vault eversion or complete procidentia uteri. This implies that the vagina and/or uterus are maximally prolapsed with essentially the entire extent of the vaginal mucosa everted.

The order of examinations was randomized, and the examiners were blinded to each other's results. The two examinations occurred on the same visit. If the subject felt too uncomfortable to complete the examination, she would be discontinued from the study. Once the POP-Q and S-POP were completed, the data was kept in the box until all subject data was completely obtained.

The sample size required for this study was calculated using one population proportion formula with a type I and type II error less than 0.05. A previous study from the same center reported that the overall stage association was 0.77.[6] The total sample size required was 100. Demographic information was described using percent, mean $\pm$ standard deviation (SD), and median (interquartile range). Primary outcomes were the overall ordinal stages from each examiner, as well as ordinal stages from the anterior, posterior, cervix, fornix, and apical vaginal segments. Agreement between S-POP and POP-Q stages was determined by kappa statistical analysis. For kappa statistics, a value between 0.81 and 1.0 is considered to indicate excellent agreement, value between 0.61 and 0.8 indicate substantial agreement, value between 0.41 and 0.60 indicate moderate agreement, and value below 0.40 indicate poor agreement.

Results

One hundred subjects were recruited. The median age was 61 years. Median parity was three (range, 1 - 14). Ten subjects (10%) had previous hysterectomy (Table 1). According to the POP-Q system, pelvic organ prolapse overall stage I, II, III and IV were demonstrated in 8%, 54%, 27% and 11%, respectively. There were three urogynecologists and four first-year residents who participated in the present study. The intersystem agreement between POP-Q and S-POP are noted in Table 2 - 6. The kappa statistics for overall stage was 0.77, for the anterior vaginal wall was 0.79, for the posterior vaginal wall was 0.78, for the cervix was 0.73 and for the vaginal cuff was 0.56.

Substantial agreement was shown for the overall stage of pelvic organ prolapse and the anterior vaginal wall, posterior vaginal wall and the cervix. Only moderate agreement was only found for the vaginal cuff. It should be noted that for the overall ordinal stage, the anterior vaginal segment, the posterior vaginal segment and the cervix there were no S-POP examinations that disagreed by more than one stage (Tables 2, 3, 4 and 5). For the cuff, there were only two subjects where the level of disagreement was more than one stage different (Table 6).

Table 1 Subjects' Characteristics (N = 100)

Characteristic	Subject
Age, y	
Mean ± SD	58.1 ± 12.7
Median (interquartile range)	61 (19.0)
BMI, kg/m^2	
Mean ± SD	24.0 ± 3.2
Median (interquartile range)	24.4 (4.2)
Parity	
Median (interquartile range)	3 (2)
Hysterectomy, No. (%)	10 (10)
Symptomatic, No. (%)	87 (87)
Asymptomatic, No. (%)	13 (13)

Table 2 Intersystem Agreement Between POP-Q and S-POP; Overall Stage (N = 100)

Standard POP-Q Stage	S-POP Stage			
	Stage I	Stage II	Stage III	Stage IV
Stage I	7	4	0	0
Stage II	0	47	2	0
Stage III	0	3	22	2
Stage IV	0	0	4	9

Kappa statistic was 0.77.

Table 3 Intersystem Agreement Between POP-Q and S-POP; Anterior Vaginal Wall (N = 100)

Standard POP-Q Stage	S-POP Stage			
	Stage I	Stage II	Stage III	Stage IV
Stage I	11	0	0	0
Stage II	7	44	1	0
Stage III	0	1	26	2
Stage IV	0	0	3	5

Kappa statistic was 0.79.

Table 4 Intersystem Agreement Between POP-Q and S-POP; Posterior Vaginal Wall (N = 100)

Standard POP-Q Stage	S-POP Stage			
	Stage I	Stage II	Stage III	Stage IV
Stage I	41	4	0	0
Stage II	4	37	1	0
Stage III	0	4	7	0
Stage IV	0	0	0	2

Kappa statistic was 0.78.

Table 5 Intersystem Agreement Between POP-Q and S-POP; Cervix (N = 90)

Standard POP-Q stage	S-POP Stage			
	Stage I	Stage II	Stage III	Stage IV
Stage I	52	2	0	0
Stage II	2	7	3	0
Stage III	0	5	10	1
Stage IV	0	0	1	7

Kappa statistic was 0.73.

Table 6 Intersystem Agreement Between POP-Q and S-POP; Posterior Fornix/Cuff (N = 100)

Standard POP-Q stage	S-POP Stage			
	Stage I	Stage II	Stage III	Stage IV
Stage I	75	5	3	0
Stage II	1	5	0	0
Stage III	1	1	4	1
Stage IV	1	0	2	1

Kappa statistic was 0.56.

Discussion

Pelvic organ prolapse affects women of all ages and negatively impacts their quality of Life.[8, 9] Evidence-based tools for consistent assessment of prolapse have been developed, validated, and used by many clinicians. Standardization of pelvic organ prolapse classification is a key feature for researching and improving quality of care. The POP-Q system has been validated and thoroughly studied, and it has been found to be a precise and reproducible technique for describing pelvic organ prolapse. However, while the POP-Q system is being used in the majority of literature published on pelvic organ prolapse,[4, 10] it has not been universally adopted among clinicians in urogynecology, and there is little evidence it is being adopted by the general practitioners.[11] Moreover, the POP-Q is a relatively complex system and it was found to be very difficult to teach the POP-Q system to OB&GYN residents.[12, 13] The S-POP was developed as a simplified alternative to the POP-Q with only four measured points using categorical staging and approximating the measures as opposed to directly measuring the point with a ruler. Therefore, a simple prolapse classification system that has good agreement with the scientific standard, POP-Q, would be a benefit to clinicians. This would allow general practitioners who not familiar with the POP-Q system to evaluate their patients, interpret the literature and better employ it in their clinical practice. However, the limits in the number of patients examined by each individual examiner and the number of first year residents participating might be our limitations.

This study showed substantial agreement of staging between the POP-Q and S-POP for all of the vaginal segments except vaginal cuff. The least correlation was found at the posterior fornix. This finding was consistent with the previous study conducted at our institution.[6] In comparison to the previous studies which evaluated the inter-system agreement of the POP-Q and S-POP, this study used a naive group, which may more closely represents the undifferentiated generalist in OB&GYN, to perform the S-POP examination and comparing their results to urogynecologists performing the POP-Q examination. The results using these two populations of clinicians were similar to previous studies suggesting that the S-POP maintains good inter-system agreement with the POP-Q regardless of the degree of sophistication of the healthcare providers performing the examinations.[6, 14] This suggests that these results are generalizable which would make the S-POP examination a good clinical alternative to the POP-Q. Therefore, we suggest that POP-Q system will remain the standard examination for classifying the stages of the pelvic organ prolapse in scientific research while the S-POP may find a place among a general practitioners or physicians who are not familiar with the POP-Q system. This study can advance the knowledge of pelvic organ prolapse in worldwide extended aside from urogynecologists to general practitioners or physicians in the future. As far as research is concerned, the original pelvic organ prolapse quantification system remains the standard to be followed. However, S-POP remains a second best choice, certainly from the research point of view.

Conclusions

There was substantial agreement between the POP-Q and the S-POP that examined by urogynecologist and first-year-OB&GYN residents that represent general practitioners. The S-POP would be more applicable to clinical practice for the majority of healthcare providers worldwide.

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Original Article/นิพนธ์ต้นฉบับ

การประเมินภาวะอวัยวะในอุ้งเชิงกรานหย่อน ด้วยระบบการประเมินแบบง่าย โดยแพทย์ประจำบ้านสูตินรีเวชชั้นปีที่ 1

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บทคัดย่อ

บทนำ: การตรวจอุ้งเชิงกรานหย่อนด้วยระบบมาตรฐาน (Pelvic organ prolapse quantification system, POP-Q) มีความซับซ้อนและแปลผลยาก คณะกรรมการสากลจึงเสนอการตรวจด้วยระบบประเมินแบบง่าย (Simplified version of the POP-Q, S-POP) โดยอ้างอิงกับการตรวจแบบมาตรฐาน แต่กำหนดจุดสมมุติให้น้อยลง

วัตถุประสงค์: เพื่อประเมินความสัมพันธ์ระหว่างการตรวจด้วยระบบมาตรฐานโดยแพทย์นรีเวชทางเดินปัสสาวะ และการตรวจด้วยระบบประเมินแบบง่ายโดยแพทย์ประจำบ้านสูตินรีเวชชั้นปีที่ 1

วิธีการศึกษา: การศึกษาแบบภาคตัดขวางในสตรีที่มีและไม่มีอาการกระบังลมหย่อน จำนวน 100 คน ที่เข้ารับการตรวจ ณ คลินิกนรีเวชทางเดินปัสสาวะและอวัยวะสืบพันธุ์ โรงพยาบาลรามาธิบดี ซึ่งได้รับการตรวจประเมินภาวะอวัยวะในอุ้งเชิงกรานหย่อน 2 ครั้ง ประกอบด้วย การตรวจด้วยระบบมาตรฐานโดยแพทย์นรีเวชทางเดินปัสสาวะ และการตรวจด้วยระบบประเมินแบบง่ายโดยแพทย์ประจำบ้านสูตินรีเวชชั้นปีที่ 1 จากนั้นบันทึกระดับการหย่อนของผนังช่องคลอดแต่ละด้าน และนำมาวิเคราะห์ความสอดคล้องระหว่างทั้งสองระบบโดยใช้สถิติ Kappa statistic

ผลการศึกษา: จากการตรวจด้วยระบบมาตรฐานพบภาวะอวัยวะในอุ้งเชิงกรานหย่อนระดับที่ I, II, III และ IV เท่ากับร้อยละ 8, 54, 27 และ 11 ตามลำดับ ผลการวิเคราะห์ความสอดคล้องของการตรวจทั้งสองระบบพบว่า มีความสัมพันธ์เท่ากับ 0.77 ในทุกระดับของการหย่อน ความสอดคล้องเท่ากับ 0.79 สำหรับผนังช่องคลอดด้านหน้า ความสอดคล้องเท่ากับ 0.78 สำหรับผนังช่องคลอดด้านหลัง ความสอดคล้องเท่ากับ 0.73 สำหรับปากมดลูก และความสอดคล้องเท่ากับ 0.56 สำหรับส่วนยอดของช่องคลอดหลังการผ่าตัดมดลูก

สรุป: การตรวจประเมินภาวะอวัยวะในอุ้งเชิงกรานหย่อนด้วยระบบมาตรฐานโดยแพทย์นรีเวชทางเดินปัสสาวะ และการตรวจด้วยระบบประเมินแบบง่ายโดยแพทย์ประจำบ้านสูตินรีเวชชั้นปีที่ 1 มีความสอดคล้องกันในระดับสูง

คำสำคัญ: อุ้งเชิงกรานหย่อน การตรวจอุ้งเชิงกรานหย่อนแบบมาตรฐาน การตรวจอุ้งเชิงกรานหย่อนแบบง่าย

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