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Association between the standardized pelvic organ prolapse quantification system (POP Q) and Shaw's system of classification for pelvic organ prolapse

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Abstract

Background: The commonly used methods of classifying or grading for the pelvic organ prolapse are qualitative and subjective with high interobserver and intraobserver variations. This absence of standardization prevents meaningful comparisons of the published series, surgical results, effective communications among clinicians and longitudinal comparison in an individual case. Aim of this study was to determine the association between the standardized pelvic organ prolapse quantification system (POP Q) and Shaw's system of classification of pelvic organ prolapse.

Materials and Methods: This was an observational study in which 100 cases of pelvic organ prolapse, whose average age was 47+/- 10 years, underwent two system of examinations- POP Q System and Shaws's system of classification at Sardar Vallabh Bhai Patel hospital associated with Lala Lajpat Rai Memorial Medical College Meerut by five gynaecologists by randomization of the patients, without knowing findings of each other during a period of June 2015 to July 2016. Weighted Kappa statistics was used to compare the data. It is a qualitative test.

Results: The weighted Kappa statistics was used for the intersystem association and reliability of the Shaw's classification system compared with standard POP Q system were 0.784 for the overall stage:0.782 and 0.68 for anterior and posterior compartment respectively; 0.86.for central compartment.

Conclusion: There was strong intersystem association seen between the Shaws system and POP Q system of classification of pelvic organ prolapse.

Keywords: Standard POP Q System, Shaw's system, Intersystem association.

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Introduction

Uterovaginal prolapse is a common condition affecting upto 30% of women attending gynaecological outpatient clinics[(1)] and upto 50% of the women over 50 years old.[(2)] It has been estimated that 50% of parous women have some degree of vaginal prolpase,[(3)] but only 20% of these are symptomatic.[(4)] The lifetime risk for undergoing surgery for prolapse has been estimated at 11%.[(3)] Evaluating pelvic floor anatomy and pelvic organ prolapse has been at the foremost of the gynaecological evaluation since the inception of the speciality.

The lack of standard terminology in pelvic floor disorders is major obstacle in performing and interpreting research. The commonly used methods of classifying and grading genital prolapse are qualitative and subjective with high interobserver and intraobserver variations. This absence of standardization prevents meaningful comparisons of the published series, surgical results, effective communications among clinicians and longitudinal comparison in an individual case. In 1996, International multidisciplinary committee adopted the Pelvic Organ Prolapse Quantification (POP Q) system introduced by Dr. Richard Bump.[(5)]

In the POP Q System the position of 9 sites (Fig. 1) are measured in cm in relation to hymen (negative number for proximal and positive number for distal) and recorded in grid form. Another system used for the grading of prolapse is the Shaw's system. It classifies prolapse in four stages and uses ischial spine as reference point (Fig. 2).

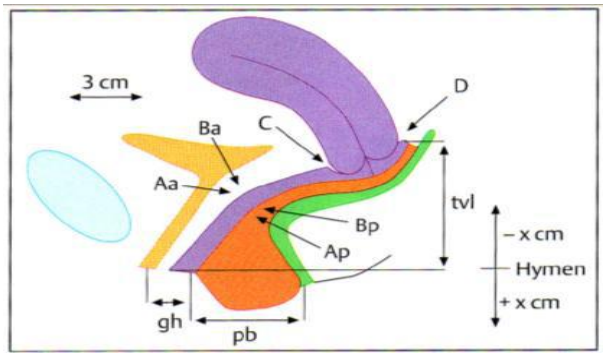

Fig. 1: Points of measurements for assessment of pelvic organ prolapse

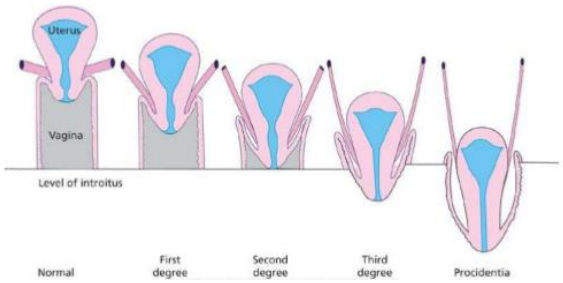

Fig. 2: Classification of uterovaginal prolapse by Shaw's system

In the present study, Patients were evaluated by both the systems and the results of both the system compared to look for intersystem association.

Materials and Methods

On approval by the ethical committee this study was conducted in the Department of Obstetrics and Gynaecology at Sardar Vallabh Bhai Patel Hospital associated with Lala Lajpat Rai Memorial Medical College Meerut from June 2015 to July 2016.

In our prospective observational study 100 cases of pelvic organ prolapse of average age 47 +/- 10 years were evaluated. The inclusion criteria for the patients were something coming out of vagina, sensation of vaginal bulging, heaviness in the lower abdomen and difficulty in emptying the bladder.

Their prolapse was graded by the Shaws system of classification and by the standard POP Q system by five gynaecologists three senior consultants and two junior residents by randomization of the patients, without knowing findings of each others. Both the classification system were compared to look for inter system association between the two systems.

After taking proper history and general examination the patient was asked to evacuate her bladder and made to lie down in the dorsal lithotomy position.

Now the prolapse was graded by using the Shaw's system of classification and thereafter by the POP Q system. For Shaw's Systems the patients were asked to perform valsalva maneuver and the point of maximum protrusion was noted. Sim's speculum was needed to usher the prolapse out during straining. Discriminate examination of the vaginal walls using the SIMS' speculum was used to evaluate the anterior and posterior walls separately, again noting the point of maximum protrusion while straining. For evaluation of the anterior wall, the posterior wall was compressed and the patient was made to strain. Similarly for evaluation of the posterior wall, the anterior wall was elevated and the patient was made to strain and then the grading was done as follows[6]

Uterine prolapse

Stage o – No prolapse
Stage I – Descent of the cervix into the vagina
Stage II – Descent of the cervix up to the introitus.
Stage III – Descent of the cervix outside the introitus.
Stage IV / Procidentia – whole of the uterus is outside the introitus.

Vaginal wall prolapse

Anterior wall

- Upper 2/3 cystocele
- Lower 1/3 urethrocele

Posterior wall

- Upper 1/3 enterocele
- Middlile1/3 rectocele
- Lower 1/3 deficient perineum

For the POP Q evaluation, the patients were asked to perform valsalva maneuver and the point of maximum protrusion was noted. Sim's speculum was needed to usher the prolapse out during straining. Marked Ayers spatula was used for measurement and grid with 3 columns and rows is drawn and labeled with patient's name.

First measurement of the genital hiatus (Gh) perineal body (Pb), and total vaginal length (Tvl), when the prolapse was reduced and without straining using a marked ayre's spatula and entered in grid.

Points C and D were next measured during maximal Valsalva's maneuver. Aa, Ba points on anterior vaginal wall and Ap, Bp points on posterior vaginal wall were measured during maximum straining/ valsalva's maneuver. Staging of pelvic organ prolapse was done as shown in Table 1.

Table 1: The Pelvic Organ Prolapse Quantification (POP Q) Staging System of Pelvic organ support

Stage 0	No Prolapse Points Aa, Ba, Ap, Bp are all at -3cm.
Stage I	The most distal portion of the prolapse is more than 1cm above the level of hymen
Stage II	Quantification value is less than -1 cm. The most distal portion of the prolapse is 1 cm or less proximal or distal to the hymen.
Stage III	Quantification value is ≥ -1cm but ≤ +1 cm
Stage IV	The most distal portion of the prolapse protrudes more than1 cm below the hymenal plane Quantification value is>(+1) but < + (tvl -2cm) Complete eversion of vaginal walls. Quantification value > (+ Tvl -2 cm)

The grading was decided by the leading edge of the prolapse.

In order to study the intersystem association between the standard POP Q and Shaw's classification of prolapse, we compared both the system and correlation was determined by weighted kappa statistics.

For compartment wise comparison, prolapse only in a single compartment was considered, assuming the rest compartments to be having no prolapse, thereafter the grading of prolapse was done by the standard POP Q system

Table 2: Intersystem association between the standard POP Q vs Shaw's system of classification for pelvic organ prolapse: overall stage

Standard POP Q	Shaw's system			
	Stage1	Stage 2	Stage 3	Stage 4
Stage 1	1			
Stage 2		14		
Stage 3		1	48	
Stage 4			12	24

Number of observed agreements: 87 (87.00% of the observations)
Kappa= 0.784
SE of kappa = 0.056
95% confidence interval: From 0.675 to 0.893
The strength of agreement is considered to be 'good'.

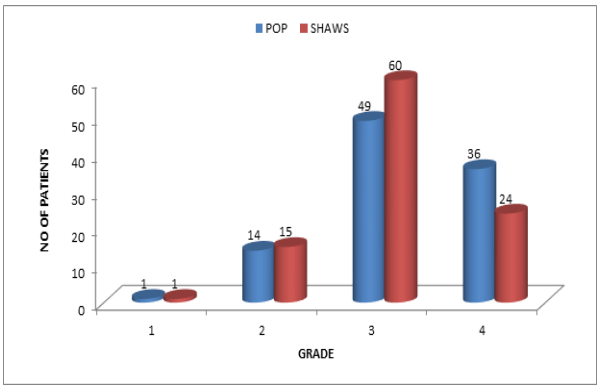

Fig. 3: POP Q vs Shaw's (overall staging of pelvic organ prolapse)

Table 3: Intersystem association between the standard POP Q system vs Shaw's system of classification for pelvic organ prolapse: central compartment

OP Q	Shaw's			
	Stage 1	Stage 2	Stage 3	Stage 4
1	2	4	3	
2	3	10		
3		2	41	
4			10	21

Number of observed agreements: 74 (79.57% of the observations)
Kappa= 0.681
SE of kappa = 0.062
95% confidence interval: From 0.560 to 0.802
The strength of agreement is considered to be 'good'.

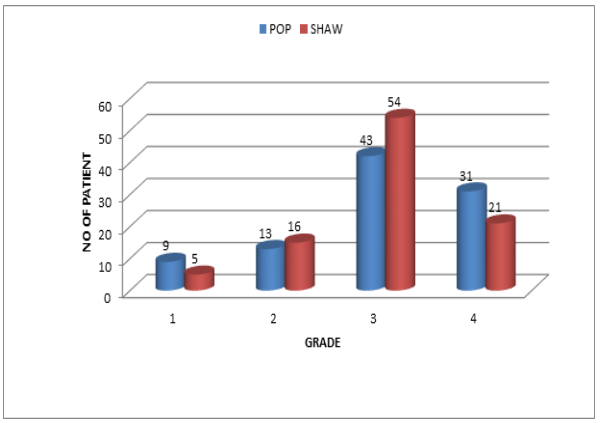

Fig. 4: POP Q vs Shaw's for central compartment for pelvic organ prolapse

Table 4: Intersystem association between the standard POP Q for pelvic organ prolapse vs Shaw's system of classification: Anterior compartment of pelvic organ prolapse

POP Q	Shaw's			
	Stage 1	Stage 2	Stage 3	Stage 4
1	5	2		
2		12		
3			42	
4			11	21

Number of observed agreements: 80 (86.02% of the observations)
Kappa= 0.782
SE of kappa = 0.055
95% confidence interval: From 0.673 to 0.891
The strength of agreement is considered to be 'good'.

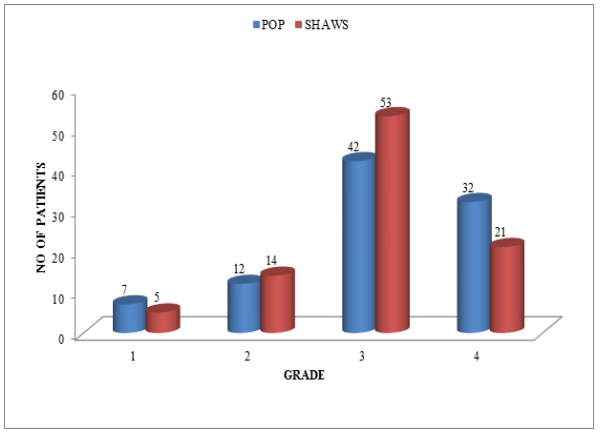

Fig. 5: POP Q vs Shaw's for Anterior compartment of pelvic organ prolapse

Table 5: Intersystem association between the standard POP Q system vs Shaw's system of classification: Posterior compartment of pelvic organ prolapse

POP Q	SHAWS'			
	1	2	3	4
1	10			
2		19		
3		3	32	1
4			2	2

Number of observed agreements: 63 (91.30% of the observations)
Kappa= 0.862
SE of kappa = 0.054
95% confidence interval: From 0.757 to 0.967
The strength of agreement is considered to be 'very good'.

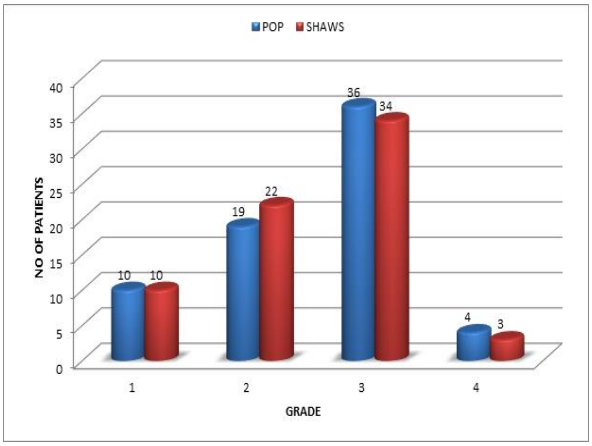

Fig. 6: POP Q vs Shaw's for Posterior compartment of pelvic organ prolapse

Results

One hundred patients with average age 48 years +/- 12 years (range 35 years to 65 years) with average parity five (range 2-12) were included in this study. In the present study it was seen that there was strong intersystem association between the standard POP Q and Shaw's grading system. On evaluation of the intersystem association the weighted kappa statistic (Table) was 0.78 for overall stage, for the central compartment was 0.68 and for anterior and posterior compartment was 0.76 and 0.86 respectively.

On comparing the two systems (Table 2, Fig. 3), number of patient having grade 1 prolapse by POP Q and by Shaw's classification system was 1 and under grade 2 was 14. Number of Patients having grade 3 prolapse by both the system was 48. Patients falling under grade 4 prolapse by both the classifications were 24. However, there were 12 patients who had stage 4 prolapse when evaluated by the standard POP Q method and by shaw's system of classification they had stage 3 prolapse.

For comparing central compartment defects (Table 3, Fig. 4), for the standard POP Q system, we have only considered the defect of the central compartment for assigning the grade of the prolapse and the anterior compartment defect and posterior compartment defect were not considered and the leading edge of prolapse was the point c and grading was done with respect to this point.

Patients coming under stage 1 by both the systems were 2. Patients having stage 2 prolapse by both the system were 10 Patients falling under the stage 3 prolapse by both the classifications were 41 and patients having grade 4 prolpase by both the system were 21.

However, there were 3 patients who had stage 2 prolapse when evaluated by the standard POP Q method and by shaw's sytem of classification patient had stage 1 prolapse. There were 4 patients who had grade 1 prolapse by the POP Q system and by Shaw's method they came under stage 2. There were 2 patients with stage 3 prolapse by POP Q and stage 2 prolapse by Shaw's system.10 patients with POP Q stage 4 prolapse came under Shaw's grade 3.

For comparing anterior compartment defects (Table 4, Fig. 5), for the standard POP Q system, we have only considered the defect of the anterior compartment for assigning the grade of the prolapse and the posterior compartment defect and central compartment defect were not considered i.e. the leading edge of prolapse was the point Ba and grading was done with respect to this point.

Patients coming under stage 1 by both the systems were 5.Patients having stage 2 prolapse by both the system were 12. Patients falling under the stage 3 prolapse by both the classifications were 42 and patients having grade 4 prolapse by both the systems were 21. However, there were 2 patients who had stage 1 prolapse when evaluated by the standard POP Q method and by shaw's sytem of classification patient had stage 2 prolapse. There were 11 patients who had grade 4 prolpase by the POP Q system and by Shaw's method they came under grade 3.

For comparing Posterior compartment defects, for the standard POP Q system(Table 5, Fig. 6), we have only considered the defect of the posterior compartment for assigning the grade of the prolapse and the anterior compartment defect and central compartment defect were not considered i.e. the leading edge of prolapse was the point Bp and grading was done with respect to this point.

Patients coming under stage 1 by both the systems were 10.Patients having stage 2 prolapse by both the system was 19. Patients falling under the stage 3 prolapse by both the classifications were 32 and patients having grade 4 prolpase by both the system were 2. There were 3 such patients who had grade 3 prolpase by the POP Q method and stage 2 prolpse by the Shaw's system.

There were 2 patients who had grade 4 prolapse by the POP Q system and by Shaw's method they came under stage 3 there was 1 patient who had grade 3 prolapse by POP Q and stage 4 prolapse by Shaw's system.

Discussion

POP Q System is a standard system which is reliable and internationally accepted for describing the anatomical position of the pelvic organs. It is site specific and shows excellent intra-and inter examiner reliability.[7]

In spite of all these facts, it has not gained popularity because it is less user friendly, time consuming and demands expertise for its use. [8] While Shaw's system is simple and more user friendly. Due to complexity of POP Q System, shaw's system is widely used for day to day practice.

In our study, according to the POP Q System, POP with stages 1, 2, 3, 4 were demonstrated in 1,14,49, 36% patients, respectively. According to shaw's system respective stages were 1, 15, 60, 24% patients respectively. In 87% of the patients, association between overall stages was identical. The weighted kappa statistics for the intersystem reliability of the shaw's classification system were 0.784 for the overall stage, indicating good association. This was comparable to the findings of Manonai et al 2010[9] which concluded that, for the anterior vaginal wall the Kendall's tau-b was 0.71, for the posterior vaginal wall segment the Kendall's tau-b was 0.71, for the cervix the Kendall's tau-b was 0.88, for the posterior fornix/vaginal cuff the Kendall's tau-b was 0.85 which is comparable to our study. Similarly in a study by Nivedita Raizada et al (2014),[10] weighted Kappa statistics for the intersystem reliability of the S-POP classification system compared with standard POPQ classification system were 0.82 for the overall stage: 0.83 and 0.86 for the anterior and posterior vaginal walls respectively; 0.81 for the apex/vaginal cuff; and 0.89 for the cervix. All these results demonstrate significant agreement between the two systems.

Our findings showed almost perfect association for each of the four subcategories, i.e. cervical descent, anterior compartment and posterior compartment with values from 0.681, 0.782 and 0.862 respectively which shows substantial association.

Therefore, results are comparable to each other. However, shaw's drawbacks is that it is not very site specific unlike POP Q. shaw's system cannot be used for research purpose as we use POP Q System.

Conclusion

There was substantial intersystem association between results of exam performed using shaw's system for classifying the stages of pelvic organ prolapse in a clinical population in this prospective, observational, and blinded study. Since shaw's system is simple, less complicated than POP Q but correlated well with the POP Q. It would be more applicable to clinical practice for majority of obstetrician and gynaecologists globally. However, for research purpose and especially urogynaecologist, POP Q will still remain the standard.

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