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Study of the Relationship between Pelvic Organ Prolapse Quantification (Pop-Q) Staging and Decubitus Ulcer in Pelvic Organ Prolapse

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ABSTRACT

Introduction

The protrusion of pelvic organs and their associated vaginal segments into or through the vagina is called pelvic organ prolapse (POP). One of the worrisome complications of POP is decubitus ulcer. It is a feature of old, long-standing prolapse. The standardized pelvic organ prolapse quantification (POP-Q) system of classification was proposed by the International Incontinence Society (ICS) for staging pelvic organ prolapse in 1996. This system is a clear and reproducible quantification method and has more inter-observer and intra-observer reliability.

Aim of the study

This study was designed to determine the relationship of the POP-Q stage with the presence and size of decubitus ulcer.

Methods

A total of 100 cases were included in this study. We examined our patients by the POP-Q method and measured the dimension of the decubitus ulcer if present.

Results

Out of the 100 patients included in the study, 33 cases had a decubitus ulcer. As the POP-Q stage increased, the number of patients with a decubitus ulcer also increased. We also observed that larger dimension (>6 cm^2) decubitus ulcers are present in stage 3 and stage 4 POP. A statistically significant correlation was observed between the POP-Q stage and the size of the decubitus ulcer, rs=0.607, p< 0.001.

Conclusion

A decubitus ulcer becomes more common as the POP-Q stage increases. The size of the ulcer also increases with the advancing stage of POP-Q.

I. BACKGROUND

Pelvic organ prolapse refers to the protrusion or downward displacement of uterus, vaginal walls and surrounding structures like bladder, bowel and rectum from their normal anatomical position by loss of the first line of support that is the endopelvic connective tissue. The cause could be either actual tears of supportive structures, or neuromuscular dysfunction, or both [1]. Uterovaginal prolapse is a common complain of elderly women in gynaecology, and there is roughly a doubling in the risk of prolapse with every completed decade of life [2, 3].

The incidence of prolapse found in studies varies from 7.6 to 20% varying from region to region in India [4, 5]. Uterovaginal prolapse is an entity, which is known to medicine since the very beginning. This has further caused many systems of classifications to be proposed by different consultants which are based on the criteria from Beechem and Baden [6, 7].

The following figure shows that classifications of prolapse can be confusing and none fulfil all ideal criteria. The classifications from 1963 to 1996 are shown in Fig. 1. There were many pitfalls noted and none of the classifications were found to be useful for research and academic purposes and hence in 1996, ICS developed the POP-Q system which was a validated standardized system for objective assessment and staging of prolapse. Since then has been adopted ‘‘published literature’’ [8].

It is more precise and gives a clear idea of cut off stages, and also it is the only quantification method that is reproducible with studies demonstrating both interobserver and intraobserver reliability (Fig. 2). The figure gives an idea about the most recent system of pelvic organ prolapse suggested by ICS. This system has shown good reliability, taking 9 points into consideration.

However, the conventional system is found to be timeconsuming, difficult to learn and implement in daily practice, hence, a 6-point simplified version of POP-Q has been tried by Raizada Nivedita et al. [9] which has given good correlation between POP-Q and SPOP-Q.

- Stage 0 No prolapse anterior and posterior points are all - 3 cm, and C or D is between - TVL and -(TVL-2) centimetres.

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- Stage 1 The criteria for stage 0 are not met, and the most distal prolapse is more than 1 cm above the level of the hymen (less than - 1 cm).
- Stage 2 The most distal prolapse is between 1 cm above and 1 cm below the hymen (at least one point is - 1, 0, or? 1).
- Stage 3 The most distal prolapse is more than 1 cm below the hymen but no further than 2 cm less than TVL.
- Stage 4 Represents complete procidentia or vault eversion; the most distal prolapse protrudes to at least (TVL-2) centimetres.

Decubitus ulcer is seen often in a patient of uterovaginal prolapse, which occurs due to localized tissue damage and venous congestion. Its incidence ranges from 3% to 50% [10,11]. It is a feature of old, long-standing prolapse. The frequent inciting factors are venous congestion and localized trauma [12]. There is oedema and an increase in the friability of the tissue. Sometimes, these ulcers may be associated with cervical intraepithelial neoplasia and cervical malignancy [13-14]. The presence of a decubitus ulcer makes surgical correction of prolapse difficult; hence, it needs to be treated before surgery. Oestrogen-soaked vaginal+ packing is used to promote decubitus ulcer healing [15]. Glycerine and betadine packs are also useful in treating decubitus ulcers.

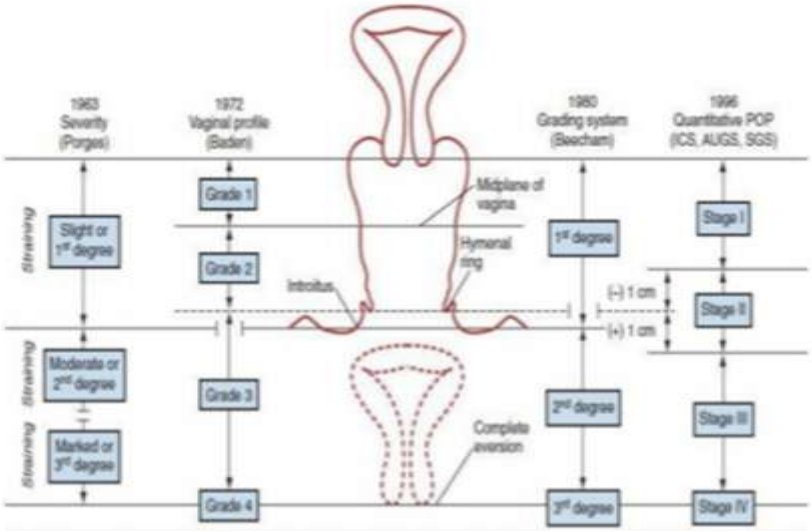
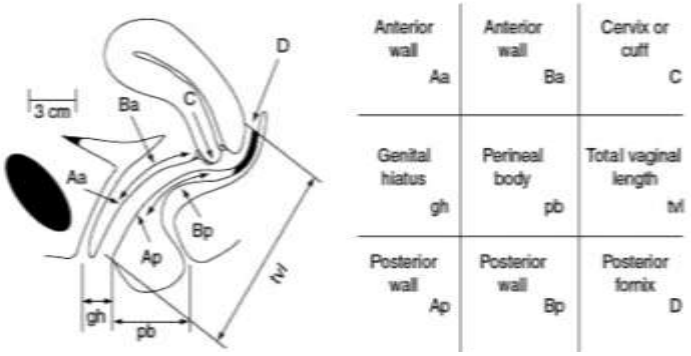


Fig. 1 Classification of uterine prolapse

Fig. 2 POP-Q grading system



II. MATERIALS AND METHODS

This is a prospective observational study carried out at Chalmeda Anand Rao Instituteof Medical Sciences, Karimnagar from June 2018 to May 2020. During this study period, a total of 106 cases came to the gynaecology outpatient department with the symptoms of pelvic organ prolapse.

Inclusion criteria:

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- All patients who had symptoms and signs of pelvic organ prolapse were enrolled.

Exclusion criteria:

- Vault prolapse and patients having any cervical pathology were excluded from the study.
- Patients with any other kind of prolapse like rectal prolapse were also excluded.

Data regarding social demographic characteristics, reproductive history, and pelvic examination findings were obtained in a predesigned proforma. Patients were examined in the dorsal lithotomy position and with an empty bladder. The prolapse was staged according to the POP-Q method, as illustrated in (Figure 1) and all the measurements were taken in centimetres with reference to the hymen.

If a decubitus ulcer was present, its number and dimension were measured. For multiple ulcers, the sum of all areas was taken. The patients were divided into small size (0 - 3 cm^2), medium size (>3-6cm^2), and large size (>6cm^2) for the study.

Informed consent was taken from all the patients participating in this study.

STATISTICAL ANALYSIS: Data of all patients were collected, tabulated in a Microsoft Excel spreadsheet. Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 21 (IBM Corp., Armonk, NY). Categorical variables were described as frequency and proportion. Proportions were compared using the chi-square and Fisher exact test, whichever was applicable. All quantitative variables were estimated using measures of central location and measures of dispersion. For normally distributed data, the mean was compared using the student's t-test and for skewed data, the Mann-Whitney U test was used for two groups. Spearman's correlation coefficient was used to assess the relationship between the stage of prolapse and the size of decubitus ulcers. For all statistical analyses, a p-value of < 0.05 was taken as significant

ETHICAL COMMITTEE: The study was approved by the ethical committee of our institution.

III. RESULTS :

Out of the 110 patients with prolapse, 9 cases had vault prolapse and one case was a post-radiotherapy case of carcinoma cervix. A total of 100 cases were included in this study. Table 1 shows the demographic variables of patients with prolapse. The mean age of occurrence of prolapse in our study was 56.86±9.5 years. Prolapse was more common in women with higher parity (74% of cases were reported in women who had three or more deliveries). A lower socioeconomic status was more commonly associated (83%) with POP. Most of the cases (85%) had a rural background.

TABLE 1: DEMOGRAPHIC OF PATIENTS WITH PELVIC ORGAN PROLAPSE

Variables		**Frequency(%)**
Age in years		56.86±9.5
Parity	1-2	26(26.1%)
	3-4	52(52.2%)
	>5	22(21.7%)
Socioeconomic status	Lower	83(83.7%)
	Middle	15(15.2%)
	Upper	2(1.1%)
Residence	Rural	85(85.9%)
	Urban	15(14.1%)
Place of delivery	Home	55(55.4%)
	Hospital	31(31.5%)
	Home & Hospital	14(13.1%)

TABLE 2: DISTRIBUTION OF CASES OF DECUBITUS ULCER ACCORDING TO POP-Q STAGE

POP-Q Stage	**Number of cases with decubitus ulcer(n=34)**	**Number of cases without decubitus ulcer(n=66)**	**Total**
Stage 1	0	14	14
Stage 2	3	18	21
Stage 3	12	26	38
Stage 4	19	8	27

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Total	34	66	100

In Table 2, the number of prolapse patients with decubitus ulcers is shown. A total of 34 cases had decubitus ulcers. Of these, stage 4 had the maximum number of cases with decubitus ulcer (19 cases) while none of the stage 1 patients had decubitus ulcer.

TABLE 3: RELATION OF POP-Q STAGE WITH DIMENSION OF DECUBITUS ULCER.

Area of decubitus ulcer	**Stage 2**	**Stage 3**	**Stage 4**	**Total**
<3cm^2	3(6.3%)	4(12.5%)	0(0%)	7(18.8%)
3-6cm^2	0(0%)	7(21.9%)	2(6.3%)	9(28.1%)
>6cm^2	0(0%)	1(3.1%)	17(50%)	18(53.1%)
Total	3(6.3%)	13(37.5%)	19(56.3%)	34(100%)

Greater than 6 cm^2 ulcers are seen maximum in stage 4 (56.3%), whereas no decubitus ulcer is observed in stage 1. 6.3% of cases of stage 2 had ulcers with a size of less than 3 cm^2 . Spearman's rho correlation coefficient (r_s) was used to assess the relationship between the POP-Q stage and the size of the decubitus ulcer, a significant correlation was observed between them, r_s =0.607, p<0.001.

TABLE 4: CHARACTERISTICS OF GROUPS WITH AND WITHOUT DECUBITUS ULCER

		Cases with decubitus ulcer (n=34)	Cases without decubitus ulcer (n=66)	p-value
Age(in years)		57.4±9.9	55.84±8.4	0.455
Socioeconomic status	Lower	26(75%)	58.7(88.3%)	
	Middle	8(25%)	7(10%)	
	Upper	0(0%)	1(1.7%)	
Residence	Rural	27(81.2%)	58(88.3%)	0.364
	Urban	7(18.8%)	8(11.7%)	
Place of delivery	Home	23(68.7%)	31(48.3%)	
	Hospital	8(25%)	23(35%)	
	Home& hospital	3(6.3%)	10(16.7%)	
Menopausal status	Premenopausal	10(28%)	15(23.3%)	0.801
	Postmenopausal	24(71.9%)	51(76.7%)	
Years since menopause (in years)		10.9±6.3	7.9±5.6	0.056
BMI(kg/m^2)		26.27±3.18	23.18±2.8	<0.001

Table 4 depicts the comparison of pelvic organ prolapse patients' characteristics between groups with and without decubitus ulcer. No statistically significant difference was observed with respect to age, socioeconomic status, place of delivery, parity, menopausal status, parity, etc. Comparison of body mass index (BMI) between the group with decubitus ulcer (M=26.27, SD= 3.18) and the group without decubitus ulcer (M=23.18, SD=2.8) demonstrates significantly higher BMI among patients with decubitus ulcer, t (90) =4.77, p<0.001.

IV. DISCUSSION

POP-Q represents the collaboration of several investigations and was adapted by the International Incontinence Society (ICS), the American Urogynaecologic Society (AUGS), and the Society of Gynaecologic Surgeons (SGS) and was finally accepted as the first internationally recognized POP classification system [16]. In the POP-Q technique, the measurements are taken in centimetres. The nine points are well-defined and so there is very less inter-observer and intra-observer variation. Because of its high accuracy, it is preferred for research purposes. In our study, the

mean age of women presenting with uterovaginal prolapse was 56.86±9.5 years. The mean age in our study is comparable to the study done by Isikhuemen ME et al., where the mean age was 56.37 years [17].

Prolapse is more common in older age women. The Pelvic Organ Support study found age to be a risk factor for pelvic organ prolapse and risk doubled with each decade of life [18]. The rate of prolapse also tends to increase with the increase in parity.

The Oxford Family Planning study analysed 17,000 women and concluded that those with a history of two vaginal deliveries were 8.4 times more likely to have surgery for prolapse than those with no such history [19]. According to an observation by Quiroz LH et al., the odds of pelvic organ prolapse were almost 10 times higher after a single vaginal birth with a marginal impact of additional births on this association [20]. Damage to supporting structures, neuromuscular dysfunction, or both occurring during difficult or non-institutional deliveries are known causes of pelvic organ prolapse.

In our study, 78% of the patients were having parity of order three or more, ranging from one to eight. Most of the patients were from lower socioeconomic status (84%). This might be due to the lack of access to a healthcare system during pregnancy and childbirth, inadequate rest in the postpartum period, early resumption of physical activity after childbirth, and lack of proper nutrition in women of low socioeconomic strata. Similarly, prolapse was more common in women from rural backgrounds (85%). Lifestyle and occupational activities in rural areas of low-income countries, which include lifting heavy weights, direct the pressure on pelvic floor muscles to cause prolapse. We also observed that prolapse was more common in women who had a home delivery than women who had their delivery at hospitals. This might be because of unattended births at home or the use of improper techniques used by untrained midwives or dais attending the home deliveries. Lack of proper care during deliveries is one of the major risk factors for prolapse.

In our study, we observed that there is an increase in the incidence and size of decubitus ulcer as the POP-Q stage increases. Most of the cases neglected themselves and presented late with a higher stage of pelvic organ prolapse and a larger size of decubitus ulcer.

A similar result has also been shown by Deshpande et al. [21]. Deshpande et al. also observed that as the measurement of point C increases, the area of decubitus ulcer also increases. The only problem with the POP-Q technique is its complexity for the beginners to understand and the time consumed for the total examination. A six-point simplified version of POP-Q was suggested by Raizada N et al. as SPOP-Q [22]. When we compared prolapse with decubitus ulcer and various other factors, we observed that decubitus ulcers are more common in old patients. Old patients and postmenopausal patients have low oestrogen levels, which can be the reason behind mucosal atrophy, venous congestion, and decubitus ulcer.

Similar results were reported by Isikhuemen ME et al. [17]. A decubitus ulcer is more seen in patients coming from low socioeconomic status. The reason behind this may be poor become severe, that is, when the prolapse is either stage 3 or 4. When compared for various risk factors, no difference was observed among the groups with and without decubitus ulcer except body mass index. A significantly higher BMI was observed in patients with decubitus ulcers. Systematic review and meta-analysis by Giri A et al. demonstrated that overweight and obese women are more likely to have pelvic organ prolapse as compared with women with body mass index in the normal range [23].

V. CONCLUSIONS

A decubitus ulcer is a quite common association of pelvic organ prolapse, but it has not been studied as extensively. Decubitus ulcers become more common as the POP-Q stage increases. The size of the ulcer also increases with the advancing stage of POP-Q.

So if we find a decubitus ulcer during the examination of a prolapse patient, we have to correct it first. It should be treated properly before a surgical procedure is done for better postoperative results and fewer difficulties during the operative correction of pelvic organ prolapse.

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