Original Article

Prolapse worsens with age, doesn’t it?

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Background: Female pelvic organ prolapse is common and generally thought to worsen over time. This assumption has recently become less plausible, as the author and others have been able to show that mild to moderate pelvic organ descent is common in young, nulligravid women.

Aims: To investigate the relationship between age and pelvic organ prolapse.

Methods: The records of 1110 women seen for interview, clinical examination, urodynamics and ultrasound were evaluated in a retrospective study. Data were analysed to investigate the relationship between patient age at presentation and pelvic organ descent on clinical examination and ultrasound imaging.

Results: After removal of 139 datasets of women with previous incontinence or prolapse surgery, 971 datasets remained. Mean age was 54 years (17–90), mean vaginal parity was 2.4 (0–12), with 31% complaining of prolapse. We found weak complex relationships between age and cystocele/rectocele staging, with a positive correlation to menopause and a negative relationship thereafter. This was confirmed on imaging findings, with regression showing an almost parabolic fitted line plot for cystocele and rectocele, but a near-linear curve for uterine prolapse. In nulliparous women, the positive relationship between age and cystocele in premenopausal women was still significant ($P = 0.028$), indicating that it is not explained by the confounding effect of child bearing.

Conclusions: Ageing seems to play a complex role in the aetiology and pathogenesis of pelvic organ prolapse. Our results contradict epidemiological studies showing age to be a major risk factor for pelvic reconstructive surgery and pelvic organ prolapse.

Key words: cystocele, female pelvic organ prolapse, rectocele, ultrasound, uterine prolapse.

Introduction

Female pelvic organ prolapse is a common condition in parous women. It conveys a significant burden on individuals and society, even if it rarely threatens the general health and/or life of the patient. In the US alone, pelvic organ prolapse is thought to lead to over 250 000 surgical procedures per year, with about 30% being re-operations.1 In a population study performed in the Pacific Northwest, the lifetime risk of undergoing a single operation for prolapse or incontinence by age 80 was found to be 11.1% in 1997.2 Female pelvic organ prolapse may give rise to symptoms of vaginal fullness and dragging, with the patient eventually noticing a protrusion from the vagina. Certain forms of prolapse are associated with bladder and bowel dysfunction,3,4 although the exact nature and magnitude of such associations are not well defined at present. As prolapse is a relative indication for surgery, options of pelvic reconstructive surgery have to be discussed with patients. Commonly, prolapse surgery is undertaken on the assumption that the condition is likely to worsen over time. A recent review article blandly states that age is an established risk factor,5 and large-scale epidemiological and observational studies seem to support the concept.6–9 This generally accepted assumption has recently become less plausible, as the author and others have been able to show that mild to moderate pelvic organ descent is common in young, nulligravid women10 and that many women with mild and moderate prolapse are asymptomatic.11,12 If prolapse were to generally deteriorate over time, then we should see a much larger proportion of patients presenting with severe prolapse in their sixties and seventies than actually populate our clinics, given that so many young women show first- and second-degree prolapse of all three compartments.

A large cohort of women assessed by International Continence Society (ICS) POP-Q staging13 and by ultrasound14 for pelvic organ prolapse was analysed to determine associations between patient age and pelvic organ descent.

Methods

At a public tertiary urogynaecological centre, 1110 women were seen for a standardised interview, a clinical examination...
using the ICS POP-Q system, multichannel urodynamics and ultrasound imaging supine and after voiding, using 2D and 3D capable systems such as Philips HDI 1000 (Philips, Eindhoven, The Netherlands), Medison SA 8000 (Medison, Seoul, South Korea) and GE Kretz Voluson 730 expert (GE Kretz Ultrasound, Zipf, Austria). Pelvic organ descent on ultrasound was determined relative to the inferoposterior margin of the symphysis pubis, supine and after bladder emptying, as previously described, see also Fig. 1. Because of the absence of a posterior point of reference, ultrasound assessment of the posterior compartment seems to correlate less well with clinical findings than sonographic quantification of anterior and central compartment prolapse.

In cases with marked descent of one compartment, it was sometimes impossible to view the opposite compartment sufficiently well for numerical assessment which explains reduced numbers of observations for posterior compartment descent. As regards the uterus, this is often invisible if atrophic or very high, and this, together with 229 cases of previous hysterectomy, explains a markedly reduced number of observations for uterine descent. Age was stratified in decades, from the middle of one life decade to the next (as in 25–34.9, 35–44.9 etc.) in order to approximate the age of menopause with the transition from one category to the other.

The parent project had been approved by the institutional Human Research Ethics Committee (reference 05/029). Statistical analysis was undertaken using Minitab version 13 (Minitab Inc., State College, PA, USA). After normality testing (Kolmogorov–Smirnov analysis) we used ANOVA for categorical variables (clinical prolapse staging versus age) and univariate and multivariate regression analysis for continuous variables (organ descent on ultrasound versus age). A \( P < 0.05 \) was regarded as statistically significant.

### Results

Eleven hundred and ten datasets were retrospectively analysed. After removal of 139 datasets of women with previous incontinence or prolapse surgery, 971 datasets remained. All results given here relate to this population. Mean age was 54 years (range 17–90), mean vaginal parity was 2.4 (range 0–12), and 229 women (23%) had previously undergone a hysterectomy. Three hundred and three women (31%) complained of symptoms of prolapse. Patients presenting with stress incontinence were significantly younger than those presenting with symptoms of prolapse (54.2 vs 57.8 years, \( P < 0.001 \)). Table 1 gives demographic data and clinical findings. There were 965 ultrasound observations as regards bladder descent, 856 for rectocele

<table>
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**Figure 1** Prolapse assessment by translabial ultrasound. The line of reference is placed through the inferior margin of the symphysis. Descent of the bladder, the uterus and the rectal ampulla is measured against this line.

**Figure 2** ANOVA of clinical prolapse grading (cystocele) versus age (\( n = 954 \)). SD, standard deviation.

**Figure 3** ANOVA of clinical prolapse grading (uterine descent) versus age (\( n = 814 \)). SD, standard deviation.
ANOVA statistics for clinical prolapse staging versus stratified age groups showed weak associations that were complex, with an increase in mean prolapse grade to about the age of menopause, and a decrease thereafter (see Figs 2–5). This was confirmed on analysing imaging findings. The pattern was also visible when we analysed the raw data prior to removal of patients who had previously undergone anti-incontinence or –prolapse surgery. On univariate regression, we found a weak and complex relationship between age and cystocele, with a positive correlation to menopause and a negative relationship thereafter ($R^2_{adj.} = 3.0\%$, $P < 0.001$, see Fig. 5). A similar effect was seen for rectocele ($R^2_{adj.} = 4.2\%$, $P < 0.001$, see Fig. 6), but for uterine descent the relationship was stronger ($R^2_{adj.} = 8.7\%$, $P < 0.001$) and virtually linear (see Fig. 7).

In order to determine whether the positive association between age and cystocele was due to the confounding effect of childbirth, we analysed nulliparous women ($n = 67$) separately and found a significant linear positive relationship.
between age and cystocele \((P = 0.028)\) to age 55. For the other compartment there were no significant relationships between age and prolapse in this group, likely due to insufficient power.

**Discussion**

From our data obtained in a large cohort of women symptomatic for pelvic floor disorders, it appears that ageing plays only a limited role in the aetiology and pathogenesis of pelvic organ prolapse. There may be an increase in organ descent in premenopausal women due to ageing, and this effect is not entirely explained by the confounder of vaginal childbirth. However, in our data the relationship between age and anterior or posterior compartment prolapse was reversed after menopause. For central compartment prolapse it appears that deterioration over time is more likely than for cystocele, regardless of patient age, but the relationship between age at presentation and prolapse severity is so weak as to be almost meaningless.

These findings are counterintuitive as clinicians generally assume that prolapse is likely to worsen over time, with age accepted as an established risk factor. Why is it then that other investigators have found associations between age and prolapse, even if such associations are generally quite weak? Is it that we simply expect to see more prolapse in the elderly because this is what everybody assumes? Does vaginal atrophy influence the visual appearance of a given degree of organ descent? It is unlikely that our findings are simply an artefact of the ultrasound method since POPQ grading showed similar results (see Figs 2–5), with the most marked prolapse found in the decades between ages 45 and 65.

Our results are not an artefact of excluding patients who had surgery for incontinence and prolapse, either, since an analysis of raw data prior to removing women with such prior surgery yielded the same parabolic relationships.

Our results also contradict epidemiological studies showing age to be a risk factor for pelvic reconstructive surgery; but this discrepancy could well be due to confounders such as symptoms of prolapse and/or bladder or bowel dysfunction. Symptoms of prolapse may become more likely with increasing urogenital atrophy, and it is possible that prolapse repair is often undertaken in the hope of ameliorating bladder or bowel symptoms; the prevalence of which increases with age, such as urge incontinence, frequency, nocturia, constipation and symptoms of obstructive defecation.

While there may be deterioration in pelvic organ support in any given individual, our findings suggest that anterior and posterior compartment prolapse are at least as likely to improve as to deteriorate in postmenopausal women. There are two substantial cohort studies that investigate the likelihood of progression, and both show high rates of ‘spontaneous regression’, challenging the assumption that prolapse worsens over time. While these studies also show substantial progression rates (29% at five years in), it is rather likely that in many cases ‘progression’ or ‘regression’ are due to false-negative examination results either at the initial assessment (masquerading as ‘progression’) or at a subsequent examination (suggesting ‘regression’), since false-negative findings on examination are common, generally due to unrecognised levator activation. When progression rates are subtracted from regression, both studies suggest little true change over time.16,17

Unfortunately, the data obtained for this retrospective study is insufficient to further analyse the impact of confounders such as menopausal status, body mass index and the degree of urogenital atrophy, and it is not a longitudinal study that would be required to conclusively determine the likelihood of progression and regression. However, our results are plausible in view of biomechanical data showing stiffening of vaginal tissues after menopause, an effect that should result in a reduction of distensibility and, hence, prolapse. A population study would be required to examine the effect of bladder and bowel symptoms on age at presentation of women with female pelvic organ prolapse. It is also recognised that our patients were not a cross-section of the population at large, and our findings may only apply to women presenting with symptoms of pelvic floor disorders, or rather, those presenting to a urogynaecological clinic.

In conclusion, ageing seems to play a limited role in the aetiology and pathogenesis of pelvic organ prolapse. In our population, the degree of anterior and posterior compartment prolapse is not associated to any meaningful degree with age at presentation. This information may be useful when counselling women with asymptomatic prolapse or mild symptoms, who can often be reassured that their condition is unlikely to worsen significantly. However, this may not be true for uterine descent.

**References**


