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Predictors of patient preference for mode of delivery following an obstetric anal sphincter injury

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ABSTRACT

Objectives: Patients who sustain an Obstetric Anal Sphincter Injury (OASI) have the opportunity to select an elective caesarean section over a vaginal delivery in subsequent pregnancies. It remains unclear whether there are identifiable factors which predict expectant mothers' choices. The primary aim of our study was to explore this issue further in a consecutive group of patients who had suffered OASI.

Study design: Data were retrospectively collected for patients attending a specialist OASIS clinic between July 2016 and February 2018. Information routinely collected in clinical practice was considered including mode of previous delivery, severity of OASI, combined with anal incontinence symptoms and endoanal ultrasound results. Logistic regression analysis was used to explore the relationship between these variables and the preferred mode of delivery.

Results: A total of 188 patients were identified of whom 153 had complete data for analysis. Approximately 30% (n = 45) of patients preferred to have a caesarean section in their subsequent pregnancy. Bivariate analysis revealed significant associations between choosing a caesarean section in subsequent pregnancy and individuals with major tears ($p = 0.001$), high anal incontinence scores ($p = 0.001$) and defects on endoanal ultrasound ($p < 0.001$). Logistic regression analysis showed statistically significant associations between Caucasian ethnicity (Odds ratio (OR) 12.6, 95% CI 2.4–69.9) and endoanal ultrasound results (OR 2.3, 95% CI 1.7–3.2) with preference for caesarean section.

Conclusion: Our data suggests that emphasis is placed by patients on endoanal ultrasound results when making their decision about mode of delivery in a subsequent pregnancy, suggesting a useful application of this tool. Ethnicity is a strong predictor of choice of delivery after OASI and may be potentially useful in forecasting maternity unit services.

Introduction

Obstetric Anal Sphincter Injuries (OASI) occur in approximately 3% of all vaginal births in the UK [1]. The Royal College of Obstetricians and Gynaecologists (RCOG) recommends that, where possible, following OASIS patients should be followed up in a dedicated clinic with access to endoanal sonography to facilitate assessment of the anal sphincter complex to aid decision making regarding future delivery [1]. In the UK, patients who suffer an OASI are offered the choice of an elective caesarean section or vaginal delivery in their subsequent pregnancy. However, there are currently no randomised controlled trials or clear evidence based recommendation to indicate the ideal mode of delivery in this situation. There is a paucity of literature exploring factors which may influence individual choices after OASI.

The authors were interested to investigate which factors in particular influenced patient preference regarding mode of delivery in subsequent pregnancy following OASI. We particularly wished to explore the relationship between endoanal ultrasound results, but also considered several other variables, which we felt might be predictive of preferred mode of delivery. Specifically, we looked at patient demographics, mode of previous delivery, severity of OASI, and subjective incontinence symptoms.

This topic is of relevance to practicing obstetricians and gynaecologists caring for patients following OASI. The issue of increasing caesarean section rates is well known and knowledge of variables that predict patient preference may help positively influence the rate of vaginal delivery after OASI and may be potentially useful in forecasting and managing demand for specific

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maternity services. To our knowledge, the present study is the first to explore the relationship between endoanal ultrasound assessment and preferred mode of delivery.

Materials and methods

We retrospectively analysed data on all patients attending a specialist OASI clinic in a large, university teaching hospital between July 2016 and February 2018. Postnatal patients were reviewed at 3–6 months after delivery. A small number of antenatal patients were also reviewed in the clinic between 18 and 36 weeks gestation. Following assessment, all patients were counselled regarding their options for delivery in subsequent pregnancy by a single consultant with an interest in OASI. All patients are provided with the results of the endoanal ultrasound and were made aware of the risks and benefits of both vaginal delivery and caesarean section, and the lack of clear evidence to recommend either mode of delivery. After counselling, all patients were asked to state their preferred mode of delivery in subsequent pregnancy.

The primary predictor variable in this study was endoanal ultrasound scan results, with any anal sphincter complex defects expressed as Starck score [2]. The Starck score describes the extent of defects in the external and internal anal sphincters by length, depth and size (0 = no defect, 16 = maximal defect). The main outcome variable was preferred mode of delivery (vaginal versus caesarean section) in future pregnancy. Additionally, we considered patient demographics, severity of OASI, anal incontinence symptoms graded according to St Mark's faecal incontinence score, and mode of previous delivery to explore any bearing these variables may have. St Mark's faecal incontinence score is a validated tool which assesses symptoms of anal incontinence. It also provides information on the impact of these symptoms on patient's quality of life. This gives a score between 0 (perfect continence) and 24 (total incontinence) [3].

Data regarding patient demographics, parity, severity of OASI, mode of previous vaginal delivery (spontaneous or instrumental), current symptoms and results of endoanal ultrasound scan were collected. The severity of OASI was recorded as per RCOG guidelines. For the purposes of analysis, this was divided into minor tear (3a and 3b) and major tear (3c and 4) in keeping with other published studies [4].

Data were analysed using the SPSS for Windows statistical package (SPSS Inc,. Chicago, IL). Data were assessed using frequency and descriptive statistics. Chi-squared test was used to compare categorical variables and independent sample *t*-test to compare continuous variables. Odds ratios were then computed. Binary logistic regression analysis was used to determine significant associations between predictor variables with the preferred mode of delivery. A p-value <0.05 was considered significant.

Results

A total of 188 patients were identified of whom 153 had complete data for analysis. Individuals with no documented preference for subsequent mode of delivery were excluded from analysis. Thirty-nine patients were antenatal, while the remaining 114 patients were reviewed postnatally. Approximately 30% (n = 45) of patients preferred to have a caesarean section in their subsequent pregnancy. The relationship between independent predictor variables and the frequencies of preferred vaginal delivery or caesarean section after OASI are illustrated in Table 1. We noted an interesting ethnic variation in our sample. Of those patients preferring caesarean section 69% (n = 31) were caucasian. The mean ages between those preferring vaginal delivery or caesarean section did not differ significantly. Similarly, there was no statistically significant difference between preferred mode of delivery for primiparous and multiparous subjects (Table 1).

Table 1
Baseline characteristics of the study sample. Data are number (%) unless stated otherwise.

Variable	Preferred mode of delivery		p value
	Vaginal delivery	Caesarean section	
Mean age (SD)	30 (5)	32 (6)	0.34
Ethnicity			0.06
Caucasian	57 (65%)	31(35%)	
Black/ethnic minority	51 (78%)	14 (22%)	
Parity			0.98
Primiparous	87 (73%)	33 (27%)	
Multiparous	21 (64%)	12 (36%)	
MOD with OASI			0.07
Spontaneous vaginal	72 (71%)	29 (29%)	
Instrumental	36 (69%)	16 (31%)	
Severity of OASI[a]			0.001
Minor (3a or 3b)	89 (79%)	24 (21%)	
Major (3c or 4)	15 (48%)	16 (52%)	
Mean St Mark's score (range)	1 (0–9)	2 (0–9)	0.001
Mean Starck score (range)	1 (0 – 14)	5 (0 – 14)	<0.001

MOD = Mode of delivery.
[a] Missing data: n = 9.

Bivariate analysis demonstrated statistically significant associations between St Mark's faecal incontinence score (p = 0.001) and Starck score (p < 0.001) with a preference for a caesarean section. Severity of OASI was also predictive of caesarean section, with a major tear resulting in a four-fold increase in caesarean section as the preferred mode of delivery (unadjusted OR 3.9, 95% CI 1.7–9.1). Caucasian patients were almost twice as likely to choose caesarean section (unadjusted OR 1.95, 95% CI 0.9–3.9).

Using logistic regression analysis, we aimed to explore the relationship between age, ethnicity, parity, previous mode of delivery, severity of OASI, St Mark's faecal incontinence score and Starck score with preferred mode of delivery in subsequent pregnancy (Table 2). When all predictor variables were considered together, they significantly predicted whether a patient would prefer a caesarean section (n = 153, chi square 76.93, df 8, p < 0.001, adjusted R-squared 0.63). Multivariate analyses showed statistically significant associations between only two variables, Caucasian ethnicity and high Starck score, and patient preference for a caesarean section in a subsequent pregnancy (Table 2). Interestingly, severity of OASI and St Mark's faecal incontinence score were no longer statistically significant predictors of preferred mode of delivery in regression model.

Table 2
Logistic regression analysis showing relationships between predictor variables and patient preference for caesarean section following OASI.

Variable	Odds Ratio	95% Confidence Interval		p-value
		Lower	Upper	
Age	1.0	0.9	1.1	0.75
Caucasian ethnicity	12.6	2.3	69.9	0.004
Primiparous	2.6	0.7	9.5	0.15
OASI with SVD	1.3	0.4	4.2	0.70
Minor Tear	0.9	0.1	11.3	0.98
Major Tear	1.4	0.1	23.6	0.81
St Mark's score	1.1	0.9	1.5	0.34
Starck Score	2.3	1.7	3.2	<0.001

SVD = Spontaneous Vaginal Delivery.

Discussion

The present study is the first to explore potential impact of endoanal ultrasound scan assessment following OASI and its association with preference for mode of delivery in a subsequent pregnancy. The presence or absence of defects in the anal sphincter complex identified on endoanal ultrasound scan was classified using the Starck scoring system. We found a statistically significant association between patient preference for caesarean section in subsequent pregnancy and higher defect scores ($p < 0.001$). The converse is also true. In our sample only 11 out of 97 subjects with no obvious sphincter defect after primary repair (Starck score 0) indicated a preference for a caesarean section in future deliveries. This finding suggests the emphasis placed by patients on individualised information from ultrasound results when making their decision about mode of delivery in a subsequent pregnancy

Currently, approximately 32% of UK hospitals provide follow-up in a dedicated OASI clinic with only 13–16% offering routine endoanal ultrasound assessment [5,6]. As our data suggests that a reassuring scan result may encourage more patients to deliver vaginally in the future, reducing the cost and clinical risks associated with caesarean section, more routine use of endoanal ultrasound may be beneficial. Research has demonstrated poor correlation between patient symptoms and Starck score [7]. Therefore, the presence of anal sphincter complex defects cannot be predicted accurately by reported incontinence symptoms. A published meta-analysis of anal sphincter injury after vaginal deliveries found an incidence of occult sphincter damage of 26.9% and 8.5% in primiparous and multiparous women respectively, with only one third of these subjects reporting symptoms [8]. The present study has demonstrated that objective ultrasound sphincter assessment score appears to be a highly significant predictor with regards to patient choice for future delivery in contrast to anal incontinence symptoms score (Table 2).

Our study also highlights ethnicity as an important variable in predicting whether a patient will choose a vaginal delivery or caesarean section after OASI, with caucasian patients twelve times more likely to choose a caesarean section (OR 12.6, 95% CI 2.4–69.9). At present, there are no studies exploring the relationship between ethnicity and preferred mode of delivery after OASI. However, several studies have investigated this variable in relation to preferred mode of delivery after one previous caesarean section; a comparable situation as patients also have the choice of delivering vaginally or by caesarean section. These studies confirm that caesarean section rates are higher in caucasian women, who were half as likely to choose vaginal delivery after a previous caesarean section [9–11]. Further research is required to investigate why a higher proportion of caucasian patients prefer caesarean section. Our data lends support to the argument that more careful counselling of caucasian patients might be required to discuss the benefits associated with vaginal delivery to reduce the proportion opting for caesarean section.

In a recent study, Long et al examined factors that may influence patient preference after OASI and demonstrated that severity of tear was a significant predictor of mode of delivery. The authors noted that women suffering a major tear were twice as likely to choose a subsequent caesarean section on univariate analysis [4]. This finding is in keeping with our data, which also demonstrated that severity of tear is associated with mode of delivery in univariate analysis; however, this was not the case following multivariate analyses. Long et al did not statistically adjust for confounding variables in their analysis. The authors also found higher average urinary and sexual symptom scores in patients preferring caesarean section, but this was not the case for bowel symptoms [4].

Our study has limitations consequent to its retrospective design. As our data is from a single centre, further studies would be required to ensure the results are applicable to a wider population. The authors acknowledge that patient values and preference is a complex issue and may be informed by experiences outside the clinical encounter and as such the variables considered in this study may be an oversimplification of reality. However the independent variables in our model could explain 63% of the variability in our dataset (adjusted R-squared 0.63). Recent research into preferred mode of delivery after caesarean section, a comparable situation as patients also have the choice of vaginal delivery or caesarean section, has demonstrated that the decision is influenced by experience, social exigencies and practical factors over medical risks [12,13]. Further studies are needed to investigate whether similar factors influence patient preference for mode of delivery after OASI.

The present study highlights patient ethnicity is strongly associated with mode of delivery after OASI, with Caucasian patients twelve times more likely to opt for a caesarean section. Our data also demonstrates the significance patients attribute to endoanal ultrasound findings when deciding their preferred mode of delivery in subsequent pregnancy. In contrast, the severity of OASI and the anal incontinence symptom scores was not significantly associated with mode of delivery in multivariate analyses.

Currently in the UK, not all institutions have dedicated clinics with easy access to endoanal sonography for patients following OASI. This study supports more routine use of endoanal ultrasound not only for its clinical utility but also given that reassuring findings may enable patients to make more informed decisions when exercising their choice of mode of delivery in subsequent pregnancy. Knowledge about important factors that predict subsequent mode of delivery can result in improved postpartum counselling for patients who incur OASI and optimise local service provision.

Contribution of authorship

Study conception: SB; study design: JC and SB, data collection and analysis: JC.

Production of final manuscript: JC and SB.

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Disclosure of interests

None declared.

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