233

Kamath Ammembal M[1], Jha S[1], Keriakos R[1]
1. *Sheffield Teaching Hospitals NHS Foundation Trust*

EVALUATION OF RISK FACTORS FOR OBSTETRIC ANAL SPHINCTER INJURY (OASI): IS RISK SCORING SYSTEM FEASIBLE?

Hypothesis / aims of study

Studies are required to investigate the effect of interventions to prevent OASI in women with risk factors (1). Developing a reliable Risk Scoring System to confidently predict OASI is a logical step towards this. However there is limited evidence on devising it. Our aim was to evaluate risk factors for OASI and to assess the feasibility of developing a Risk Scoring System to predict OASI antenatally.

Study design, materials and methods

This was a retrospective review comparing women who suffered OASI between 2003 and 2009 (n=800) to 800 women who delivered vaginally in the same period with no OASI. Baseline characteristics (**Table 1**) were compared for age, gestational age (GA) in weeks and BMI. Controls had greater parity, BMI and GA. Extremes of maternal age, ethnicity, BMI >30, parity, GA >41 weeks, induction of labour (IOL) , instrumental deliveries, medio-lateral episiotomy and birth weight > 4000g were evaluated as risk factors for OASI by logistic regression analysis. ROC (Receiver Operating Character) curves were drawn for each of the risk factors to assess their individual ability to predict OASI. A Risk Scoring system including nulliparity, GA>41 weeks, Birth weight > 4000g and IOL was subjected to ROC curve analysis. Ethnicity, advanced maternal age and BMI > 30 were excluded based on results of logistic regression analysis. Instrumental deliveries and episiotomy were excluded as they were intra-partum interventions. SPSS (PASW) 18 and Medcalc® software were used for data analysis.

Results

Forceps delivery [OR 3.97] and birth weight > 4000g [OR 2.06] apart from medio-lateral episiotomy [OR 2.14] appeared to be the most important risk factors for OASI. Nulliparity [OR 1.58], GA > 41 weeks [OR 1.58] and IOL [OR 1.36] did have some association with OASI. Maternal age > 39 years [OR 0.97], ethnicity [Asian OR 1.2] or BMI > 30 [OR 1.07] made no significant difference to the OASI incidence. Interestingly, women with BMI>35 appeared to be at a reduced risk for OASI [OR 0.35]. ROC curve analysis for individual risk factors corroborated the above findings. These results are summarised in Table 2. ROC curve analysis of the Risk Scoring System showed a curve area 0.539 (CI 0.515 – 0.564) with a sensitivity of 17.25%, specificity of 90.6% and PPV 52.8 when all the four factors were present **(Fig 1**).

Interpretation of results

Even a large sample size as in this study did not increase the level of association of many of the conventionally accepted risk factors for OASI. Therefore, the Risk Scoring System had poor predictive ability even when all the factors listed were present. High BMI appears to be associated with a significantly lower risk of OASI and no clear explanation could be found for this. Ethnicity has no influence on the incidence of OASI.

Concluding message

Most of the antenatal risk factors do not have sufficient enough association with OASI to devise a Risk Scoring System. Therefore, attempts to devise interventions to prevent OASI are unlikely to be successful. Any strategy to reduce the risk of OASI has to be based on evaluation of individual clinical situation. This is one of the largest studies evaluating risk factors for OASI and to date, the only other study evaluating the feasibility of developing a Risk Scoring System (2). To our knowledge, there are no other studies evaluating BMI and ethnicity as potential risk factors.

Table 1: Baseline characteristics

Characteristic	**Cases** n=800	**Controls** n=800	**P value ***
Maternal age (yrs)	28.3± 5.74	27.79±5.92	0.0787
Parity	0.62±0.81	1.12±1.3	< 0.0001
BMI	24.85±4.53	26.29±7.84	< 0.0001
GA (Weeks)	39.92±1.3	39.05±2.71	< 0.0001

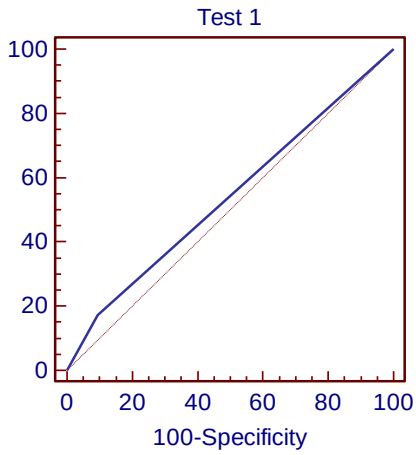
* Statistical't' test

Table 2: Results

Risk factor		**Cases** n = 800	**Controls** n = 800	**OR**	**CI (95%)**
Maternal age	14 - 19	64 (8%)	59 (7.2%)	1.12	(0.77–1.61)
	>39	19 (2.37%)	20 (2.44%)	0.97	(0.51–1.83)
Nulliparity		409 (51.12%)	326 (39.8%)	1.58	(1.29 – 1.92)
Ethinicity	White	551 (68.87%)	587(71.67%)	0.87	(0.7– 1.08)
	Asian	98 (12.25%)	85 (10.37%)	1.2	(0.88 – 1.64)
	African	30 (3.75%)	37 (4.51%)	0.82	(0.5– 1.3)
GA > 41 Weeks		233 (35.46%)	169 (25.18%)	1.58	(1.25- 1.98)

BMI	>30	515/ 699 (73.67%)	546/ 755 (72.31%)	1.07	(0.84 – 1.35)
	>35	20/699 (2.86%)	58/755 (7.68%)	0.35	(0.21 – 0.59)
IOL		194 (24.25%)	156 (19.04%)	1.36	(1.07 – 1.72)
Forceps		261 (32.62%)	89 (10.86%)	3.97	(3.04 – 5.17)
Ventouse		114 (14.25%)	81 (9.89%)	1.51	(1.11 – 2.05)
Medio-lateral episiotomy		333 (41.62%)	204 (24.9%)	2.14	(1.73 -2.65)
Birth Wt. > 4000g		138 (17.25%)	75 (9.15%)	2.06	(1.53 – 2.79)

Figure 1: ROC curve analysis



ROC curve interpretation: The curve area close to 0.5 and proximity of the curve to the diagonal suggests poor predictive ability of the test. The curve for a test with good predictive ability will be close to the top left corner of the graph with curve area close to 1.

References
1. RCOG Green-top guideline : Management of third and fourth degree perineal tears 29 March 2007
2. Williams A, Tincello D, White S, Adams EJ, Alfirevic Z, Richmond DH Risk scoring system for prediction of obstetric anal sphincter injury BJOG 2005; 112: 1066 – 1069

Specify source of funding or grant	**None.**
Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require ethics committee approval because	**it was a review of database and was classified as service evaluation/ development.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**No**