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PREVALENCE AND RISK FACTORS FOR ANAL INCONTINENCE: NEW INSIGHT THROUGH AN IDENTICAL TWIN SISTERS STUDY

Hypothesis / aims of study

Anal incontinence (AI) is a symptom associated with a potentially devastating impact on physical and psychosocial health. The higher prevalence of AI in women as compared to men is primarily attributed to childbirth. Although several risk factors associated with mode of delivery as well as obstetric complications and interventions have been suggested, their relative importance is unknown, and their effect may be confounded by genetic risk factors (1). The current study is the first to use an identical twin model in order to allow for optimal assessment of environmental risk factors for AI by controlling for genetic variance.

Study design, materials and methods

An extensive survey of incontinence symptoms was conducted at the world's largest annual gathering of twins at the 2003 Twins Day Festival, in Twinsburg, Ohio, U.S.A. 148 pairs of identical twin sisters completed questionnaires detailing the presence, frequency and severity of AI. We utilized a logistic regression model with repeated binary measures in order to account for correlated data within pairs (2). Univariate analysis as well as a multivariate stepwise logistic regression models were implemented to a large number of demographic, medical and obstetrical factors. In order to maintain statistically valid reference groups, we utilized 3 different models: The first, concentrated on non-obstetrical risk factors and included all pairs of twins (n=296); the second evaluated obstetrical risk factors in parous-parous twin pairs where both sisters delivered by either vaginal or cesarean section (CS) (n = 196), and the third was designed to evaluate factors specific to the vaginal birth mode and included pairs where both sisters had at least one previous vaginal delivery (n=146). We performed the univariate (t and Chi square tests), and stepwise multivariate analyses using Excel and SAS.

Results

Table 1: Demographic data (n=296)

Age (years)	49 ± 12
Parity	1.8 ± 0.3
BMI	27 ± 6.3
Race	
Caucasian	266 (90%)
African American	21 (7%)
Postmenopausal	133 (45%)
Past surgeries	
Hysterectomy	59 (20%)
Anti-incontinence surgery	7 (2.4%)
Parous	228 (77%)
Vaginal birth	194 (86%)
Forceps	55 (24%)
Episiotomy	164 (72%)
CS only	31 (14%)
Elective	4 (2%)
During labor	27 (12%)

Values are presented as means ± SD or as number (percent).

Table 2: Prevalence of anal incontinence (%)

	Fecal	Flatal	Any
All women	12	26	31
Parous	13	32	37
Vaginal births	17	34	40
CS only	6	31	36
Elective	**0**	**0**	**0**
During labor	8	37	41
Forceps delivery	9	26	29
Episiotomy	19	34	41

Table 3: Odds ratios of various risk factors for anal incontinence

Variable	Fecal	P	Flatal	P	Any	P
Age >40	1.84	**0.035***	1.98	**0.028***	2.07	**0.024***
Menopause	2.20	**0.001***	2.50	**0.004***	2.25	**0.017***
Parity						
1	0.32	0.34	3.86	**0.007***	3.15	**0.011***
≥ 2	3.12	**0.054**	4.15	**0.002***	3.69	**0.001**
Stress Urinary Incont.	3.3	**0.027***	1.85	**0.019***	1.82	**0.019***
CS only	0.62	0.42	0.68	0.33	0.74	0.43
Episiotomy	1.89	0.30	1.41	0.31	1.53	0.22
Prolonged 2nd stage	1.65	0.34	1.17	0.91	1.05	0.66
Forceps delivery	0.41	0.22	0.48	0.22	0.52	0.10
Birth weight > 4 Kg	0.68	0.52	0.67	0.25	0.55	0.10
Smoking	0.71	0.58	0.62	0.63	0.85	0.81
BMI>25	1.46	0.38	1.50	0.22	1.22	0.50
Prev. Hysterectomy	1.32	0.47	0.94	0.74	1.004	0.99

Interpretation of results

Any type of AI (flatal or fecal) was reported in 31% of all women (Table 2). The prevalence of flatal incontinence was twice that of fecal incontinence (26% vs. 12%). Significant risk factors for AI included age >40, menopause, parity, and presence of stress urinary incontinence (Table 3). Among women who had CS only, those who had CS after initiation of labor had lower rates of fecal but similar rates of flatal incontinence than women who had vaginal delivery. Women who had planned (elective) CS reported no fecal or flatal incontinence (Table 2). Although not statistically significant, episiotomy and prolonged 2nd stage of labor were associated with increased risk for anal incontinence. Forceps delivery, high birth weight, previous hysterectomy, BMI and smoking habits did not affect the risk for AI.

Concluding message

This is the first study to apply an identical twin research design to female AI, providing almost absolute control over genetic risk factors. AI was reported by nearly one third of these community dwelling women, increasing with age, menopause and parity. While CS after initiation of labor conferred protection against fecal incontinence only, elective CS seemed to be protective against both fecal and flatal incontinence. Future studies should investigate the possible role of elective caesarean delivery in preventing AI.

References

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