Incidence and risk factors of postpartum anal incontinence A prospective study of 503 cases.

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Incidence et facteurs de risque de l'incontinence anale du Post-partum : Etude prospective a propos de 503 cas.

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R É S U M É

Prérequis : La prévalence de l'incontinence anale du post-partum (IAPP) a toujours été sous évaluée et ses facteurs de risque n'ont pas été confirmés par tous les auteurs.

But : évaluer l'incidence de l'IAPP et identifier les principaux facteurs de risque prédisposant à cette pathologie à court et à moyen terme.

Méthodes : Etude prospective observationnelle au service « B » du CMNT sur une période de 5 mois allant du 01 mars au 31 juillet 2009.

Résultats : 503 patientes ont été incluses. La prévalence de l'IAPP était de 4.2% à J4 et de 4% à 6-8 semaines post partum. Les facteurs prédisposent à l'IAPP à J4 étaient : l'extraction instrumentale par forceps (P<0.001), la durée de la phase active > 5 H (P= 0.047), la durée des efforts expulsifs > 20 mn (P< 0.001), la révision utérine (P=0.001) et la survenue d'une déchirure vaginale de 1ère degré (P< 0.001)A 6-8 semaines du post partum, les facteurs de risque identifiés étaient, la survenue d'une dystocie des épaules (P< 0.001), une distance ano-vulvaire ≤2cm, l'existence d'un périnée cicatriciel et le diamètre abdominal transverse > 105mm (P<0.001).

Conclusion : Des mesures préventives devraient être mise en œuvre chez les parturientes à risque afin d'éviter la survenue de l'IAPP.

M o t s - c l é s

Incontinence fécale ; accouchement ; post-partum.

S U M M A R Y

Background: Background: Anal incontinence is a devastating functional postpartum complication. it can cause deep deterioration in the quality of life.

Aim : To assess the incidence of postpartum anal incontinence (PPAI) and the major risk factors predisposing for it in the short and middle terms.

Methods: This prospective observational study was conducted in the department of Obstetrics and Gynecology B in the Maternity and Neonatology Center of Tunis between March 1st and july 31st, 2009.

Results: Five hundred and three women were included. PPAI was 4.2% on the fourth day postpartum and 4% between weeks 6 and 8 postpartum. Predisposing factors to 4th day PPAI were forceps delivery (p<0.001), prolonged second stage of labor> 5hours (p=0.047), expulsion phase > 20mn (p<0.001), uterine revision (P=0.001) and first degree perineal lacerations (p<0.001).

Between 6 and 8 weeks postpartum, identified risk factors were Shoulder dystocia (p<0.001), anu-vulvar distance <2cm, perineal scars and transverse abdominal diameter >105mm (p<0.001).

Conclusion: Preventive measures must be implemented in patients with PPAI risk factors.

K e y - w o r d s

Fecal incontinence; Delivery; postpartum

انتشار وعوامل الخطر سلس الشرج بعد الولادة : دراسة حول 503 حالة

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الكلمات الأساسية : سلس الشرج – ولادة – مابعد الولادة

Anal incontinence is a devastating functional postpartum complication. In some patients this disorder is periodic and is defined as the unintentional loss of flatus, liquid or stool, but in other women it causes deep deterioration in the quality of life and self-esteem. Postpartum anal incontinence (PPAI) can be due to occult injury to the sphincter or its innervations. The severity and frequency of anal incontinence decrease with time in months following delivery [1].

Its prevalence is thought to be between 13 and 54% but it is recorded in only 5% of medical case reports [2].

This underestimate of IAPP is due to a double silence: The patients who avoid asking for medical attention on one hand, and doctors who do not seek it. The Risk factors suggested by some studies have not been confirmed by others.

The aim of the present study is to evaluate the incidence of IAPP in our department, to identify the main risk factors of this dysfunction and to study the progression of symptoms and signs in the short and mid terms.

MATERIAL AND METHODS

This prospective observational study was conducted in the department of Obstetrics and Gynecology B in the maternity and neonatology center of Tunis between March 1st and july 31st, 2009.

The study was explained to eligible patients and informed consent was obtained from patients who agreed to participate; 503 women were included.

Women who did not agree to participate and those presenting inflammatory bowel diseases or neurologic disorders were excluded.

The questionnaire involved the patient's medical history, data on the progression of pregnancy, and findings of physical and gynecologic examinations. Fetal ultrasound findings, delivery course and neonatal data were recorded on an inquiry form.

Instrumental vaginal deliveries were performed by obstetricians when needed using forceps.

The use of Thierry's spatulas or vacuum is unusual in our department. Perineal tears, when they occurred, were classified into 4 categories depending on their severity [4].

Patients were informed about the risk of PPAI and were asked about fecal urgency, incontinence of flatus, liquid stool and solid stool. Fecal urgency was defined as the inability to defer defecation for more than 5 minutes. Fecal incontinence included either incontinence of flatus, liquid stool or solid stool. Patients were first asked about the symptoms on the fourth day postpartum and then on the follow-up visits between weeks 6 and 8 of postpartum.

When symptoms of anal incontinence were reported, a thorough physical examination was carried out and the patient was referred to a gastro-enterology department for further investigations. Collected data were captured in EXCELL and analyzed with SPSS program version 11.5.

Results are presented as simple frequencies and percentages for qualitative variables and as mean ± standard deviation (SD) for quantitative variables.

Mean comparison was studied using student's test; percentage comparison was analyzed by Pearson X2 and Fisher test.

The effect of risk factors was assessed using Odds ratio. In order to calculate odds ratio, qualitative variables were changed in two terms. For the determination of the threshold where to cut quantitative variable, we established ROC curves (receiver operating characteristics). After verifying that the area under the curve (AUC) was significantly greater than 0.5 we chose as a threshold the value of the variable that represented best the sensitivity-specificity pair.

Univariate analysis was used to calculate the crude odds ratio (OR), to compare cases and controls for each potential risk factor. All statistically significant ($P < 0.05$) variables from the univariate analysis and potential clinically relevant and previously cited risk factors were entered into a multivariate logistic regression mode.

The study was approved by the ethics committee of our institution.

RESULTS

From March 1st 2009 to July 31st 2009 there were 1554 deliveries in the department of Obstetrics and Gynecology B in the Maternity and Neonatal Center of Tunis. Our study involved 503 patients. Only 480 women received followed-up care; 23 patients (4.6%) were lost to follow-up.

Of the 480 followed-up patients, 39 of them (7.8%) reported some postpartum anal incontinence. Anal incontinence was discovered on day 4 postpartum in 21 patients (4.2%), and between weeks 6 and 8 postpartum in 18 patients. Two patients of those who presented a fourth day incontinence remained incontinent for six to eight weeks after delivery(5.1% of AIPP). It means a total of 20 patients had PPAI (4%).

On the fourth day after delivery, 95 % of patients had flatus incontinence (20 patients), and 5% had liquid stool incontinence. No cases of solid stool incontinence or of fecal urgency were reported.

On the second follow-up visit between weeks 6 and 8 postpartum, 19 cases of flatus incontinence (95%) and one case of stool incontinence (5%) were reported.

We tried to establish a relationship between anal incompetence on the fourth day after delivery and the one between weeks 6 and 8 postpartum. No statistically significant difference was detected by neither Pearson test nor Fisher test ($p=0.21$). So new cases of anal incontinence appearing between weeks 6 and 8 postpartum were independent of IAPP manifested on the fourth day after delivery.

Thresholds for different parameters were determined from ROC curves.

Mean age of patients was 29.18 years, and mean parity was 1.98 .Only one patient had a history of fecal incontinence . Fifty percent of our parturients were primiparous. Twenty percent of parturients underwent cesarean section. In vaginal delivery, the mean time of active labor was 142 minutes. Vertex presentation was occipito-sacral in 5.5% of cases. Episiotomy, mediolateral in all cases, was performed in 72% of cases. Forceps was used

in 6.4% of deliveries. Fetal macrosomia (fetal weight >4000g) was noticed in 7.5% of neonates.

In the univariate analysis of the different parameters, some factors were significantly related to a high rate of anal incompetence on the fourth day after delivery (Table 1) and between weeks 6 and 8 postpartum (table 2).

Table 1: Risk factors for fourth day PPAI

Risk factor	Patients with 4th day PPAI N(%)	Patients without 4th day PPAI	P	OR (Ic 95%)
Second stage of labor > 5 hours	2 (11.1)	4 (1.5)	0.47	8.3 (1.4-49.2)
Neonatal weight> 4000g	5 (23.8)	31 (6.8)	0. 015	4.3 (1.5-12.5)
Head circumference > 35cm	8 (38.1)	73 (15.9)	0.015	3.2 (1.3-8.1)
Forceps delivery	17 (81)	15 (3.3)	<0.001	125.8 (37.7-419.6)
Expulsion phase> 20 minutes	10 (47.6)	18 (5.1)	<0.001	17 (6.3-45.3)
Uterine revision	17 (81)	199 (43.4)	0.001	5.5 (1.8-16.7)
Episiotomy	21 (100)	328 (71.5)	0.002	1.06 (1-1.1)
Perineal first degree laceration	6 (28.6)	7 (1.5)	<0.001	25.8 (7.7-86.2)

Table 2: Risk factors for 6 to 8 day PPAI

Risk factor	Patients with PPAI N (%)	Patients without PPAI N (%)	P	OR (IC 95%)
Age> 30 ans	12 (60)	170 (37)	0.038	2.5 (1-6.3)
Parity >2	12 (60)	90 (19.6)	<0.001	6.1 (204-15.5)
Weight > 75kg	11 (55)	132 (35.8)	0.03	2.8 (1.1-7.4)
Uterine height> 32cm	16 (80)	186 (40.4)	<0.001	5.8 (1.9-17.9)
Ano-vulvar distance <2cm	4 (20)	116 (25.3)	0.035	6.4 (0.8-48.6)
Perineal scars	16 (80)	164 (35.8)	<0.001	7.1 (2.3-21.8)
TAD > 105mm	8 (40)	44 (16.1)	<0.001	20.8 (4.2-101.3)
BIP >93mm	7 (35)	80 (14.5)	0.01	5.6 (1.4-22.5)
Femoral length >73mm	8 (40)	62 (13.5)	<0.001	13.6 (2.8-66)
Shoulder dystocia	17 (85)	9 (2)	<0.001	283.9 (70.4-
NN weight > 4000g	13 (65)	23 (5)	<0.001	1144)
Head circumference >35cm	15 (75)	66	<0.001	35.2 (12.8-96.8) 17.9 (6.2-51)

In the multivariate analysis ,factors considered in the univariate analysis were re-studied to identify those directly related to PPAI.

Logistic regression allowed us to calculate a proper odds ratio for each factor. (Table 3).

Development of fecal incontinence and of involuntary flatus on the fourth day postpartum was significantly associated in the univariate analysis with prolonged second stage of labor>5 hours, duration of expulsive efforts > 20 minutes, uterine revision and first degree sphincter tear.

In the multivariate analysis the significant variables between weeks 6 and 8 postpartum were perineal scar and transverse abdominal diameter> 105mm.

Nevertheless, instrumental delivery ; adjusted COR =12415945, ano-vulvar distance < 2cm; adjusted COR =34617,6 and shoulder dystocia seem to be in the univariate analysis strongly associated with the fourth day postpartum anal incontinence for the first parameter and with 6to 8 weeks postpartum AI for the last ones.

These factors are determining in the development of PPAI independently of any variable as shown by adjusted OR.

Table 3: Multivariate analysis; independent risk factors of PPAI

Factors	P	OR (IC 95%)
Fourth day postpartum risk factors		
Second stage of labor> 5 hours	0.001	8.8 (2.4-31.7)
Expulsive phase > 20mn	0.004	2.9 (1.4-6.1)
Uterine revision	0.012	2.9 (1.3-6.7)
First degree lacerations	0.006	3.9 (1.5-10.6)
6 to 8 weeks postpartum risk factors		
Perineal scars	0.042	3.1 (1-9.2)
TAD > 105mm	0.003	4.5 (1.7-11.8)

DISCUSSION

The frequency of PPAI was estimated at 3 to 10%, higher rates have been reported by other authors: 25 and 28.4% [4,5].

The prevalence rates vary greatly depending on the population studied, inclusion criteria, the time from delivery and definitions of fecal incontinence.

In our study, the prevalence of PPAI was estimated at 4.2% at day four postpartum and at 4% between weeks 6 and 8 postpartum. It was lightly inferior to literature data [6, 7, 8].

Factors closely linked to PPAI were instrumental delivery, shoulder dystocia, and ano-vulvar distance< 2cm. Thus, the low incidence of PPAI in our series may be accounted for by the low rate of instrumental deliveries compared with rates reported about other series and which may reach 58% of deliveries [4, 8].

Most studies report a greater risk for anal incontinence following forceps delivery compared with vacuum extraction. However, the number of cases were limited and groups of forceps versus vacuum were not comparable because of the parity number and the failure of forceps extraction [7, 9].

In our study, all instrumental deliveries were performed by forceps and therefore no sub-group analysis could be performed for the extraction by vacuum.

The reasons for the increased risk of anal incontinence with instrumental extraction by forceps are sphincter tears particularly in case of high forceps application, posterior variety and fetal macrosomia [10].

Some authors reported a high rate of occult sphincter tears occasioned by forceps and found on endo-rectal ultrasound examination, reaching in some studies 80% of cases [7, 11].

The prognostic value of these lacerations is still the subject of much debate. Significant association between anal incontinence and ultrasound lacerations was assessed by some authors [12], and disputed by others [13]. In our study, the odds ratio indicates that instrumental extraction has a 125 times higher risk of developing anal incontinence at 4 days after delivery compared with non instrumental delivery.

Ano-vulvar distance < 2cm seems to be an independent risk factor or anal incontinence between weeks 6 and 8 postpartum. A meta-analysis study conducted by De Tayrac and al concluded that ano-vulvar distance < 3cm exposes to the risk of PPAI through the occurrence of severe vulvo-perineal lacerations [14].However, according to Roman and al, a small ano-vulvar distance doesn't seem to have any specific effect on the occurrence of PPAI [6].

Prolonged second stage of labor was associated with the development of anal incontinence at four days after delivery but not at six weeks.

Prolonged second stage of labor may damage the pelvic floor by making it oedematous and fragile and thereby predisposed to sphincter injuries.

A disturbance in the innervations of the anal sphincter was associated with the duration of second stage of labor [15].

According to Naime Alex and al , a prolonged second stage of labor (>3 hours) is associated with increased maternal morbidity such as third and fourth degree perineal lacerations and instrumental delivery which leads to a higher risk of PPAI [10].These conclusions were found by other authors [1, 16, 17].

A prolonged expulsion phase multiplies the risk of PPAI by three. Similar results have been reported in the literature [17, 18]. A first degree perineal laceration is significantly related to fourth day postpartum anal incontinence.

Perineal lacerations represent a genital and pelvic mutilation that greatly exposes to perineal disorders and thus to a potential PPAI.

In the absence of third and fourth degree vulvo-perineal lacerations, several synergistic mechanisms may contribute to impaired pelvic floor after delivery injury to the pudendal nerve and the high frequency of occult sphincter injury after child birth. As shown in several studies , perineal laceration of any type was the most significant delivery event associated with postpartum fecal incontinence [1, 19].

We think that the perineum status is an important factor that may disturb anal continence because of perineal weakening in case of anterior perineal lacerations.

In the multivariate study, we found that perineum scars multiplied by three the risk of anal incontinence between weeks 6 and 8 postpartum.

Harkin and al [20] showed that third degree perineal lacerations multiplied by five PPAI risk in case of vaginal delivery. These results were not confirmed by other studies [21].

Transverse abdominal diameter >105 mm and occurrence of shoulder dystocia were significantly associated with PPAI between weeks 6 and 8 postpartum.

Few studies have isolated shoulder dystocia as a risk factor for PPAI [22, 23].

Bechhave and al [24] claimed that macrosomia was a significant risk factor for PPAI but this was confirmed neither by our multivariate analysis nor by other studies [16, 25].

CONCLUSION

The social and hygienic impact of this relative high frequency of symptoms remains to be determined. Further research is needed to determine the population based incidence and the long term significance of postpartum fecal incontinence.

References

1. Zetterstrom JP, Lopez A, Anzen B, Dozen A, Norman N, Mellgren A. Anal incontinence after vaginal delivery: a prospective study in primiparous women. Br J Obstet Gynaecol 1999; 106: 324-30.
2. Pirro N, Sastre B, Sielezneff I. What are the risk factors of anal incontinence after vaginal delivery.J Chir 2007; 144: 197-202.
3. Frilel X, Kimata P, Pigne A. Obstetric lacerations. In : Cabrol D, Pons JC, Goffinet F, eds. Traité d'obstétrique. Paris, Medicine Science, Flammarion, 2003: 965-7.
4. Chaliha C, Sultan AH, Bland JM, Monga AK, Stanton SL. Anal function: effect of pregnancy and delivery. Am J Obstet Gynecol 2001; 185: 427-32.
5. Boreham MK, Richter HE, Kenton KS et al. Anal incontinence in women presenting for gynecologic care: Prevalence, risk factors, and impact upon quality of life. Am J Obstet Gynecol 2005 ; 192 : 1637-42.
6. Roman H, Robillard PY, Payet E et al. Factors associated with fecal incontinence after childbirth. Prospective study in 525 women.J Gynecol Obstet Biol Reprod 2004 ; 33 : 497-505.
7. Sultan AH, Kamm MA, Hudson CN, Thomas JM, Bartram CI. Anal-sphincter disruption during vaginal delivery. N Engl J Med. 1993; 329: 1905-1911.
8. Benifla JL, Abramowitz L,Sobhani I et al. Postpartum sphincter rupture and anal incontinence: prospective study with 259 patients. Gynecol Obstet Fertil 2000;1:15-22.
9. Sultan AH, Johanson RB, Carter JE. Occult anal sphincter trauma following randomized forceps and vacuum delivery. Int J Gynaecol Obstet 1998; 61 : 113-9.
10. Naime-Alix A-F, Fourquet F, Sigue D, Potin J, Descriaud C, Perrotin F. How long can we wait at full dilatation. A study of maternal and neonatal morbidity related to the duration of the second stage of labour in nulliparous women.J Gynecol Obstet Biol Reprod 2008 ; 37 : 268-275.
11. Sultan AH, Kamm MA, Bartram CI, Hudson CN. Anal sphincter trauma during instrumentai delivery, Int J Gynaecol Obstet 1993; 43: 263-70.
12. Karoui S, Savoye-Collet C, Koning E, Leroi A-M, Denis P. Prevalence of anal sphincter defects revealed by sonography in 335 incontinent patients and 115 continent patients. American Journal of Roentgenology 1999 ; 173 : 389-392.42
13. Eason E, Labrecque M, Marcoux S, Mondor M. Effects of carrying a pregnancy and of method of delivery on urinary incontinence: a prospective cohort study. BMC Pregnancy and Childbirth 2004; 4: 4.
14. De Tayrac R, Panel L, Masson G, Mares P. Episiotomy and prevention of perineal and pelvic floor injuries. J Gynecol Obstet Biol Reprod 2006; 35 (suppl.1): 24-31.
15. Snooks SJ, Swash M, Heury MM, Setchell M. Risk factors in childbirth causing damage to the pelvic floor innervation. Int J colorectal Dis 1986; 1: 20-24.
16. Dupuis O, Madelenat P, Rudigoz RC. Fecal and urinary

incontinence after delivery: risk factors and prevention. Gynecol Obstet Fertil 2004; 32: 540-548.
17. Donnelly V, Fynes M, Campbell D, Johnson H, O'Connell PR, O'Herlihy C.Obstetric events leading to anal sphincter damage. Obstet Gynecol 1998; 92: 955-61.
18. Groutz A, Fait G, Lessing JB et al. Incidence and obstetric risk factors of post partum anal incontinence. Scand J Gastro enterol 1999; 34: 315-8.
19. Denis P, Bercoff E, Bizien MF et al. Prevalence of anal incontinence in adults. Gastroenterol Clin Biol 1992; 16: 344-50.
20. Harkin R, Fitzpatrick M, O'Connell PR, O'Herlihy C. Anal sphincter disruption at vaginal delivery: is recurrence predictable? Eur J Obstet Gynecol Biol Reprod 2003 ; 109 : 149-152.
21. Sze EH. Anal incontinence among women with one versus two complete third-degree perineal lacerations. Int J Gynecol Obstet 2005; 90: 213-217.
22. Lowder JL, Burrows LJ, Krohn MA, et al. Risk factors for primary and subsequent anal sphincter lacerations: a comparison of cohorts by parity and prior mode of delivery. Am J Obstet Gynecol 2007 ; 196 (supp. 344) : 1-5.
23. Barbier A, Poujade O, Fay R, Thiebaugeorges O, Levardon M, Deval B. Is primiparity, the only risk factor for type 3 and 4 perineal injury, during delivery? Gynecol Obstet Fertil 2007 ; 35 : 101-106.
24. Buchhave P, Flatow L, Rydhstroem H, Thorbert G. Risk factors for rupture of the anal sphincter. Eur J Obstet Gynecol Biol Reprod 1999; 87: 129-132.
25. Chiarelli P, Murphy B, Cockburn J. Fecal incontinence after high-risk delivery. Obstet Gynecol 2003; 102: 1299-30.