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The Efficacy of Antenatal Perineal Massage in Reducing Postpartum Anal Incontinence: A randomized controlled trial

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ABSTRACT

Objectives: This study evaluated the efficacy of antenatal perineal massage (APM) in reducing postpartum morbidities, particularly anal incontinence (AI).

Materials and Methods: A randomized controlled trial was conducted at Rajavithi Hospital, Bangkok, from October 2023 to April 2024. Nulliparous women with singleton pregnancies were randomly assigned to the APM or control group using block randomization. Participants in the APM group performed a daily 5-minute perineal massage on themselves from 34–36 weeks of gestation until delivery. Both groups received standard prenatal, intrapartum, and postpartum care. The primary outcome was AI incidence at 3 months postpartum, assessed using the Pelvic Floor Distress Inventory-20 (PFDI-20). Secondary outcomes included intrapartum variables, urinary incontinence, and dyspareunia.

Results: 106 women were randomized into two groups of 53 each. After exclusions, 37 participants per group were analyzed. At 3 months postpartum, AI incidence was lower in the APM group (32.43%) compared to the control group (56.76%), though not statistically significant ($p = 0.061$). The APM group showed significantly reduced AI severity ($p = 0.017$) and fecal incontinence incidence ($p = 0.030$).

Conclusion: Although the reduction in AI incidence was not statistically significant, the findings suggested potential clinical benefits that warrant further investigation. APM significantly reduced fecal incontinence incidence and AI severity without increasing maternal or neonatal complications. These findings support incorporating APM into routine prenatal care to reduce postpartum morbidities.

Keywords: antenatal perineal massage, perineal injuries, anal incontinence, postpartum morbidities.

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ประสิทธิภาพของการนวดฝีเย็บในระยะฝากครรภ์ในการลดภาวะอุจจาระหรือผายลมเล็ดจากการคลอดบุตร การทดลองแบบสุ่มและมีกลุ่มควบคุม

มงคล เกิดแปลงทอง, บุษรัญญา พุทธธนะพิทักษ์

บทคัดย่อ

วัตถุประสงค์: *เพื่อศึกษาประสิทธิภาพของการนวดฝีเย็บในระหว่างฝากครรภ์ ในการลดภาวะแทรกซ้อนหลังคลอดโดยเฉพาะภาวะอุจจาระหรือผายลมเล็ด*

วัสดุและวิธีการ: *การทดลองแบบสุ่มและมีกลุ่มควบคุมดำเนินการที่โรงพยาบาลราชวิถี กรุงเทพมหานคร ระหว่างเดือนตุลาคม 2566 ถึงเดือนเมษายน 2567 สตรีตั้งครรภ์ที่ไม่เคยคลอดบุตรและมีครรภ์เดี่ยวถูกสุ่มจัดกลุ่มโดยวิธีการสุ่มแบบ ไปยังกลุ่มทดลองหรือกลุ่มควบคุม กลุ่มทดลองทำการนวดฝีเย็บด้วยตนเองวันละ 5 นาที ตั้งแต่อายุครรภ์ 34-36 สัปดาห์จนถึงคลอด ทั้งสองกลุ่มได้รับการดูแลก่อนคลอด ระยะคลอด และหลังคลอดตามมาตรฐาน ผลลัพธ์หลักคือการเกิดภาวะอุจจาระหรือผายลมเล็ดภายใน 3 เดือนหลังคลอด โดยใช้แบบสอบถาม Pelvic Floor Distress Inventory-20 ผลลัพธ์รองที่ประเมินได้แก่ ผลลัพธ์ระหว่างการคลอด ภาวะกลั้นปัสสาวะไม่อยู่ และอาการเจ็บขณะมีเพศสัมพันธ์*

ผลการศึกษา: *จากผู้เข้าร่วมวิจัย 106 คน มีการคัดออก 32 คน ทำให้เหลือผู้เข้าร่วมวิจัยกลุ่มละ 37 คน ในช่วง 3 เดือนหลังคลอด อัตราการเกิดภาวะอุจจาระหรือผายลมเล็ดในกลุ่มทดลองลดลง (ร้อยละ 32.43) เมื่อเทียบกับกลุ่มควบคุม (ร้อยละ 56.76) อย่างไม่มีนัยสำคัญทางสถิติ ($p = 0.061$) อย่างไรก็ตามความรุนแรงของภาวะอุจจาระหรือผายลมเล็ดในกลุ่มทดลอง ลดลงอย่างมีนัยสำคัญทางสถิติ ($p = 0.017$) และภาวะอุจจาระเล็ดลดลงอย่างมีนัยสำคัญในกลุ่มทดลอง ($p = 0.030$)*

สรุป: *แม้อัตราการเกิดภาวะอุจจาระหรือผายลมเล็ดจะไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติ แต่ผลการศึกษาบ่งชี้ถึงประโยชน์ทางคลินิกที่ควรศึกษาต่อยอด การนวดฝีเย็บในระหว่างฝากครรภ์ช่วยลดความรุนแรงของภาวะอุจจาระหรือผายลมเล็ด โดยเฉพาะภาวะอุจจาระเล็ด โดยไม่เพิ่มภาวะแทรกซ้อนต่อมารดาหรือทารก การศึกษานี้สนับสนุนให้รวมการนวดฝีเย็บไว้ในแนวทางการดูแลในระยะฝากครรภ์ เพื่อช่วยลดภาวะแทรกซ้อนหลังคลอด*

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Introduction

Perineal tears during childbirth are a common occurrence[1], either spontaneously or due to an episiotomy. These tears can result in both short-term and long-term complications. Short-term complications include postpartum hemorrhage, wound dehiscence, infection[2], and postpartum pain[3], which can disrupt the bonding between mother and child[4] and cause dyspareunia (painful intercourse)[5]. Long-term complications may include pelvic floor dysfunctions, such as anal incontinence (AI), pelvic organ prolapse (POP), and urinary incontinence (UI), even after surgical repair[6, 7]. The long-term complications impact both physical and mental health, causing embarrassment and social withdrawal[8]. Factors that increase the risk of perineal injury include nulliparity, Asian ethnicity, median episiotomy, fetal macrosomia, precipitous labor, maternal obesity, and instrumental delivery[2].

Antenatal perineal massage (APM) has traditionally been used to improve blood circulation and relax the perineal muscles, promoting increased elasticity, expanding the birth canal, and facilitating a smoother delivery process. The massage may be performed by the pregnant individual or their partner, generally beginning 4 to 6 weeks prior to delivery. A systematic review from 2020[3] found that APM decreases the need for episiotomy, mitigates the occurrence and severity of perineal tears, shortens the duration of the second stage of labor, and improves Apgar scores at 1 and 5 minutes after birth. Additionally, it has been shown to decrease the risk of AI[3].

Due to the elevated risk of perineal tears among the Asian population and the lack of definitive research on Southeast Asian women, this study was conducted to evaluate the efficacy of APM in reducing postpartum morbidities, both short- and long-term, among pregnant women at Rajavithi Hospital. The hospital provides care to a diverse population from Southeast Asia, encompassing Thai, Myanmar, Cambodian, and Lao women.

Materials and Methods

A prospective randomized controlled trial was conducted among pregnant women attending the antenatal care clinic at Rajavithi Hospital from October 2023 to April 2024. Both healthcare workers and the investigator were blinded to the intervention. Ethical approval for the study was obtained from the Office of the Research Ethics Committee of Rajavithi Hospital. The trial was registered on ClinicalTrials.gov (ID: NCT06162312), and all participants provided written informed consent after receiving a thorough explanation of the study's objectives.

For the primary outcome, the sample size was calculated by comparing the proportion of patients experiencing postpartum AI between the two groups, with an α-error set at 0.05 and a power of 80%. Previous study[9] indicated an AI rate of 12.5% in the control group and 42% in the APM group. To account for these differences, the optimal sample size was determined to be at least 35 participants per group, with an additional 50% dropout rate due to the high cesarean section rate in the study setting. As a result, a total of 106 pregnant women were recruited for the study, with 53 participants in each group.

The statistical study was performed using SPSS Statistics version 26 developed by IBM Corp. in Armonk, NY, USA. In the case of normally distributed variables, the results were displayed as means and standard deviations (SD), while for non-normally distributed data, they were described as medians and ranges. Statistical analysis of categorical variables was conducted using the chi square test, whereas normally distributed data was analyzed using the unpaired t test. The Mann Whitney U test was used for data that did not follow a normal frequency distribution. Statistical significance was defined as a p value less than 0.05.

The inclusion criteria were nulliparous pregnant women with singleton pregnancies, aged 18 years or older, and with gestational ages ranging from 34 to 36 weeks. The fetus must be in a cephalic position. Participants were required to be proficient in the Thai

language to understand the study materials and instructions. Among the exclusion criteria were vaginal infections such as herpes or candida vulvovaginitis, mothers who had undergone cesarean sections or instrumental birth, pregnant women who have a medical history of persistent cough, present or previous problems with UI or AI, POP, or connective tissue diseases. Additionally, conditions prohibiting vaginal delivery, such as placenta previa or placenta accreta spectrum, were also considered important factors for exclusion.

Participants in the research were divided into two groups in a 1:1 ratio through block randomization, resulting in an APM group and a control group. Both groups provided personal information, including maternal age, ethnicity, body mass index (BMI), educational level, and underlying health conditions.

The APM group received instructions on perineal massage from a physician and via educational video. The participants were instructed to perform digital perineal massage, which involved lubricating their fingers with a water-based lubricant and gently inserting one or two fingers, or the thumb, 3–5 cm into the vagina to perform a 5-minute daily perineal massage. The massage consisted of three techniques: steady pressing of the perineum towards the anus for 1 minute, pressing in an up-and-down motion towards the anus for 1 minute, and pressing massage of the perineum in a U-shape motion for 3 minutes. This regimen began at 34–36 weeks of gestational age and continued until delivery. Participants practiced perineal massage under physician supervision during the first session to ensure proper technique. Participants were required to document their perineal massage sessions in a dedicated log. The research team conducted follow-up phone calls twice (after the first and third weeks) to assess the consistency of the massage, any side effects, and to encourage continuation if there were no contraindications, such as bleeding, wounds, or genital infections. Partners were also encouraged to assist with the massage at home.

Both groups underwent standard antenatal, intrapartum, and postpartum care at Rajavithi Hospital, which included labor induction, episiotomy, and cesarean section as clinically indicated. All participants were delivered by obstetrics and gynecology residents following standardized delivery and episiotomy repair protocols. The collected data included mode of delivery, degree of perineal tear, episiotomy status, duration of the second stage of labor, blood loss, newborn birth weight, Apgar scores at 1 and 5 minutes, and perineal pain evaluated 24 hours postpartum using the verbal numerical rating scale (NRS).

AI and pelvic floor health were assessed at three months postpartum using the Pelvic Floor Distress Inventory-20 (PFDI-20) via a structured phone interview. The PFDI-20 comprises three subscales: the Pelvic Organ Prolapse Distress Inventory-6 (POPDI-6) for prolapse symptoms, the Colorectal-Anal Distress Inventory-8 (CRADI-8) for bowel symptoms, and the Urinary Distress Inventory-6 (UDI-6) for urinary symptoms. Higher PFDI-20 scores reflect greater distress and more severe symptoms. AI was identified based on positive responses to questions 8, 9, or 10, while UI was determined by positive responses to questions 16, 17, or 18. The Thai translation and validation of the PFDI-20 demonstrated excellent reliability, with a Cronbach's alpha coefficient of 0.93[10].

Results

A total of 106 pregnant women were recruited (Fig. 1), with 53 assigned to the APM group and 53 to the control group. However, 32 women were excluded for the following reasons: 29 underwent cesarean section, 2 delivered at other hospitals, and 1 delivered underwent instrumental delivery.

Table 1 summarizes the demographic characteristics of the study groups, showing similarities between the APM and control groups in age, BMI, ethnicity, education, and gestational age at recruitment.

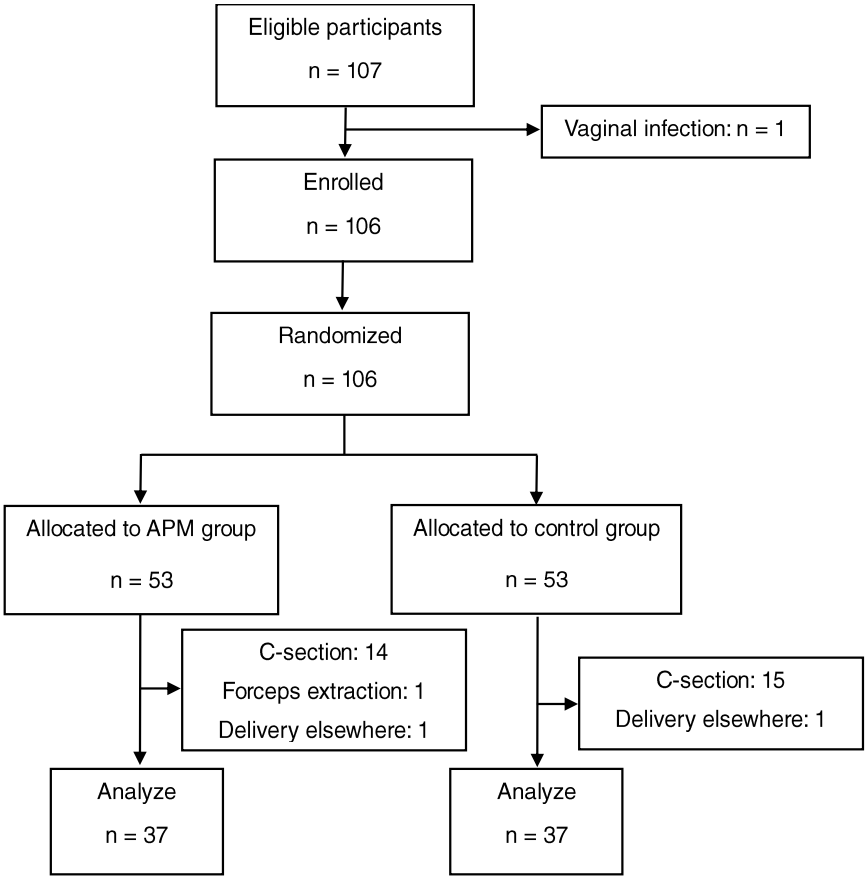

Fig. 1. Study flow diagram.

Table 1. Demographic characteristics of the studied groups.

	APM group (n = 37)	**Control group (n = 37)**
Age (years), mean ± SD	26.24 ± 5.06	25.73 ± 3.65
Body mass index (kg/m^2), mean ± SD	24.83 ± 4.12	25.06 ± 4.05
Ethnicity, n (%)		
Thai	21 (56.76)	17 (45.95)
Non-Thai Southeast Asia	16 (43.24)	20 (54.05)
Education, n (%)		
Illiterate/Primary	20 (54.05)	17 (45.95)
Secondary/College	17 (45.95)	20 (54.01)
GA at Recruitment, mean ± SD	34.84 ± 0.67	34.76 ± 0.48

† Unpaired t-test, †† Chi-square test

SD: standard deviation, APM: antenatal perineal massage.

Table 2 presents variables during labor and newborn outcomes. Gestational age at delivery, mode of delivery, second-stage duration, fetal birth weight, episiotomy rates, and blood loss were comparable between the groups, with no statistically significant differences observed. All participants experienced second-degree perineal tears, with no third- or fourth-degree tears reported. Preterm birth rates and Apgar scores at 1 and 5 minutes were similar, with no significant differences between the groups. Pain scores within the first 24 hours postpartum also showed no statistically significant difference.

Table 2. Variables during labor and newborns.

	APM group (n = 37)	Control group (n = 37)	p value
GA at delivery, mean ± SD	38.49 ± 1.47	38.65 ± 1.25	0.610†
Preterm delivery, n (%)	4 (10.81)	3 (8.11)	1.000††
Mode of delivery, n (%)			1.000††
Spontaneous labor	32 (86.49)	33 (89.19)	
Induction	5 (13.51)	4 (12.11)	
2nd stage duration (min), median (IQR)	16 (7.5-30.5)	15 (8-20)	0.495‡
Birth weight (g), mean ± SD	3,003.70 ± 352.64	2,959.46 ± 609.37	0.703†
Episiotomy, n (%)	35 (94.59)	35 (94.59)	1.000††
Degree of perineal tear, n (%) Second-degree tear	37 (100.00)	37 (100.00)	
Blood loss (ml), median (min-max)	100 (50-600)	100 (50-400)	0.771‡
Apgar score, mean ± SD			
At 1 min	8.73 ± 0.65	8.86 ± 0.54	0.333†
At 5 min	9.7 ± 0.52	9.86 ± 0.42	0.144†
Numeric rating score for pain at 24 hours, mean ± SD	4.22 ± 1.34	4.76 ±1.86	0.156†

† Unpaired *t*-test, †† Chi-square test, ‡ Mann–Whitney U test

GA: gestational age, SD: standard deviation, IQR: interquartile range, APM: antenatal perineal massage.

Table 3 presents the primary outcomes at 3 months postpartum. AI incidence was 32.43% in the APM group and 56.76% in the control group (p = 0.061). Fecal incontinence occurred in 24.32% of the APM group compared to 51.35% in the control group (p = 0.030). Flatus incontinence was reported at similar rates in both groups (13.51%, p = 1.000).

UI was reported in 24.32% of participants in the APM group and 35.14% in the control group, with no statistically significant difference (p = 0.446). Total PFDI-20 scores were lower in the APM group (median 4, IQR 2-7) compared to the control group (median 10, IQR 4.5-14, p = 0.001). Significant differences were observed in the POPDI-6 (p = 0.002) and CRADI-8 (p = 0.007) subscale, while the UDI-6 subscale showed no significant difference (p = 0.745). The AI severity subscale was significantly lower in the APM group (p = 0.017).

Both groups had a similar rate of return to

sexual intercourse at 3 months postpartum (56.76%). Additionally, pain during intercourse, assessed by a numeric rating scale, showed no statistically significant difference between groups (mean 2.62 ± 2.48 in the APM group vs 2.14 ± 2.01 in the control group; p = 0.498).

Table 3. Variables at 3 months postpartum.

	APM group (n = 37)	Control group (n = 37)	p value
Primary outcome			
Anal incontinent, n (%)	12 (32.43)	21 (56.76)	0.061††
Fecal incontinent, n (%)	9 (24.32)	19 (51.35)	0.030††
Flatus incontinent, n (%)	5 (13.51)	5 (13.51)	1.000††
Secondary outcome			
Urinary incontinent, n (%)	9 (24.32)	13 (35.14)	0.446††
PFDI-20, median (IQR)			
AI severity	0 (0-2)	2 (0-3)	0.017‡
POPDI-6	0 (0-2)	2 (0-4)	0.002‡
CRADI-8	2 (0-3)	4 (1-6.5)	0.007‡
UDI-6	2 (0-3.5)	3 (0-6)	0.309‡
Total score	4 (2-7)	10 (4.5-14)	0.001‡
Return of sexual intercourse, n (%)	21 (56.76)	21 (56.76)	1.000††
Numeric rating score for pain during sexual intercourse, mean ± SD	2.62 ± 2.48	2.14 ± 2.007	0.498†

† Unpaired t-test, †† Chi-square test, ‡ Mann–Whitney U test

SD: standard deviation, IQR: interquartile range, APM: antenatal perineal massage, PFDI-20: pelvic floor distress inventory-20, AI: Anal incontinent, POPDI-6: Pelvic Organ Prolapse Distress Inventory-6, CRADI-8: Colorectal-Anal Distress Inventory 8, UDI-6: Urinary Distress Inventory-6

Discussion

This study evaluated the efficacy of APM in reducing AI and postpartum morbidity. Although the reduction in AI incidence was not statistically significant (32.43% vs 56.76%, p = 0.061), the findings suggested potential clinical benefits, as the p value indicates a trend toward significance that may reflect a true effect of APM and warrants further investigation. Fecal incontinence was significantly lower in the APM group (24.32% vs 51.35%, p = 0.030), and the severity of AI was also significantly reduced (p = 0.017). These results aligned with Abdelhakim et al[3], who reported that APM significantly reduced AI incidence. While the relatively small sample size may have limited the ability to detect statistical significance for AI incidence, the observed improvements in fecal incontinence and symptom severity supported APM as a valuable addition to prenatal care. Further studies with larger sample sizes are needed to confirm these findings.

Both groups received episiotomies, which likely explained the lack of significant differences in intrapartum and newborn variables, such as second stage duration, and neonatal outcomes. The routine use of episiotomy may have minimized differences in

perineal trauma between the groups. Similarly, the study by Mei-Dan et al[11] found that antenatal perineal massage did not significantly reduce perineal trauma or episiotomy rates.

Regarding secondary outcomes, urinary incontinence was slightly lower in the APM group (24.32% vs 35.14%), though this was not statistically significant (p = 0.446). However, APM significantly improved overall pelvic floor health, as reflected by lower PFDI-20 scores (p = 0.001), particularly in reducing pelvic organ prolapse and colorectal-anal distress (p = 0.002 and p = 0.007, respectively). These findings suggested that APM may reduce postpartum morbidity by improving pelvic floor function among nulliparous women.

Sexual function, measured by the rate of return to intercourse and pain during intercourse, was similar between groups, with no significant differences in pain levels (p = 0.498). This suggested that APM may not have a strong influence on postpartum sexual recovery. These findings aligned with those of Manresa et al[5], which found that dyspareunia was linked to the degree of perineal trauma. However, the routine use of episiotomy in both groups likely minimized differences in perineal trauma, contributing to similar dyspareunia rates.

This study had limitations. The involvement of multiple physicians in delivering participants may have introduced confounding factors, despite adherence to standardized protocols. Additionally, the follow-up period of three months postpartum may not be sufficient to fully evaluate the long-term efficacy of APM. Future research should examine the impact of APM beyond three months to assess its prolonged benefits and effectiveness.

Conclusion

Although the reduction in the incidence of AI was not statistically significant, it demonstrated potential clinical benefits that warrant further investigation. APM significantly reduced fecal incontinence and the severity of AI, improving overall pelvic floor health and reducing postpartum morbidity among nulliparous women. These findings supported the integration of APM into routine antenatal care. Further research with larger sample sizes in settings without routine episiotomy is needed to validate these findings.

Potential conflicts of interest

The authors declare no conflicts of interest.

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