

Enema Prior to Labor: A Controversial Routine in Taiwan

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ABSTRACT: While taking an enema to induce labor is a controversial issue worldwide, in Taiwan it remains a routine procedure in many hospitals in preparation for birth. Episiotomy is also a prevalent procedure performed during the birthing process. Some physicians believe that enemas help reduce the risk of feces contamination of the episiotomy incision and, therefore, are justified as a routine procedure. This study compared the neonatal infection rates, times to appearance of fetal head, times to first post-labor bowel movement, and rates of episiotomy dehiscence of women receiving a pre-labor enema against those who did not. A total of 534 women classified with low-risk pregnancies were recruited from a medical center in central Taiwan and assigned randomly into one of two groups for a six-month period. The first group (264 subjects) received routine enema procedures prior to delivery in the first 6 months. The second group (270 subjects) did not receive enemas. Study results revealed no significant difference between enema and non-enema groups in terms of infection rates in mothers or infants or in terms of average time to fetal head appearance. While labor duration was the same for the two groups in the first and third stages of labor, the enema group experienced a relatively shorter second stage. No significant difference was observed in times to first post-labor bowel movement or episiotomy dehiscence rates. The results of this study indicate that the administration of enemas as a routine practice prior to labor is not substantiated by medical necessity. However, limitations of the research design suggest that a randomized clinical trial be adopted in the future to explore further the scientific validity of study results.

Key Words: routine enema, labor, humanized birth.

Introduction

Despite World Health Organization (WHO)'s recommendation that the practice be eliminated (WHO, 1997), the administration of enemas prior to labor continues to be prevalent in some countries. The literature on the subject is full of contradictory recommendations. Published reports have proposed enemas be used because it: (1) reduces time in labor by stimulating uterine activity reflexes and facilitating the presenting part by an empty bowel and (2) reduces puerperal infections due to feces contamination of lacerated perineal skin and neonatal infections due to fecal contact. Against this, others have recommended against using enemas as: (1) the evidence regarding the effectiveness of using

routine enemas during labor is inadequate; (2) the resultant watery feces actually increase the risk of wound contamination and the risk of maternal and neonatal enteric bacteria contamination; and (3) the routine causes discomfort to the mother and increases care costs (Cuervo, Rodriguez, & Delgado, 2004; Drayton & Rees, 1984; Romney & Gordon, 1981; Whitley & Mack, 1980; WHO, 1997).

Although the practice of routine enema during labor has been questioned as early as 1980 (Romney & Gordon, 1981; Whitley & Mack, 1980), few studies have been conducted to address the issue. Cuervo et al. (2004) conducted a systemic review and recommended the need to conduct better quality, and ideally blind and randomized, clinical trials in order to make evidence-based recommendations to

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specifically address the issue of the efficacy of administering enemas during labor (Cuervo et al., 2004).

Although the necessity of administering enemas prior to labor has been a controversial issue for quite some time, it remains a routine practice in Taiwan. In addition, episiotomy is another common practice during labor in Taiwan (Yeh, 2002). The widespread practice of episiotomy is another reason used to support the use of routine enemas, as enemas are purported to lower the risk of episiotomy-induced incision contamination. Practitioners further claim that enemas help delay the occurrence of the first bowel movement after delivery and, therefore, help lower the risk of vaginal lacerations.

Considering the increasing importance placed on humanized birthing techniques and the reduction of medical expenditures, medical professionals are paying increasing attention to women's feelings and reducing unnecessary interventions in order to improve labor care quality. Thus, it is imperative to conduct studies to determine the necessity of administering enemas prior to labor in light of the fact that the great majority of women in Taiwan receive perineal wounds during labor. This study attempts to compare the effect of enemas versus non-use of enemas on the following issues: relative infection rates in mothers and infants, relative times to appearance of fetal head, relative labor duration in terms of both total duration and duration of each of the three stages, relative times to first post-labor bowel movement, and relative episiotomy dehiscence rates.

Methods

Study Design

This study was designed as a quasi-experimental research project, with subjects divided into two groups, the first of which received routine enemas prior to labor and the second of which did not. Variables compared included rates of infection, times to appearance of fetal head, duration of the three delivery stages, times to first post-labor bowel movement, and rates of episiotomy dehiscence.

Subjects

This study was conducted in the maternity ward of a medical center in central Taiwan. A total of 534 low risk women under one doctor's care were studied between June 2002 and June 2003. During the first 6 month period, a total of 264 women underwent vaginal birth with routine enema treatment administered prior to labor. During the second period, a second group of 270 low risk women underwent vaginal birth without any enema.

The medical center is a 2,000-bed facility that assists approximately 2,000 births each year. Enemas have been routinely practiced in this hospital for many years. Study subjects were selected based on the following criteria that they: had at least 37 weeks of gestational age and were singleton and prepared to have vaginal birth. Women were excluded from this study if they experienced preterm or precipitous labor or experienced a pregnancy complicated by ante-partum hemorrhaging or severe pre-eclampsia.

Hospital Enema Routine on Admission

After the expecting woman was hospitalized and the fetal heartbeat was ascertained to be normal and the labor process was determined not to be preterm and free of precipitous labor and other complications, an enema routine was administered. The enema procedure was first described and explained to the expecting women. When the cervix was dilated to 2 cm in diameter, women were placed in a left lateral recumbent position and 3 capsules of 10 ml glycerin were inserted into the rectum. The enema used was a low volume disposable phosphate preparation. The liquid was then injected into the rectum and women were instructed to wait 5 to 10 minutes before releasing the bowel movement.

Measurement

Study outcome indicators include: infection rate, duration to appearance of fetal head, duration of different delivery stages, time to first post-labor bowel movement, and episiotomy dehiscence. Outcome indicator measurements follow below:

Infection rate

The infection indicators of this study include subject body temperature during hospitalization and signs of perineal wound infection. Temperature was taken using rectified ear-type thermometers and the infection criterion was defined as a subject ear temperature exceeding 37.6 °C. Perineal wounds were evaluated daily for the following infection indicators: wound redness, edema, ecchymosis and viscous discharge. Infection was indicated when a wound had redness, swelling, severe pain or discharge (Dickason, Silverman, & Kaplan, 2001).

Duration to appearance of fetal head

The presenting part descends toward the cervix through the first stage of labor. In this study, we use the time taken from the presenting part height which was measured when the subject was hospitalized to its descending to +3. At the time of subject hospitalization, nursing staffs performed a vaginal examination. A routine enema was administered following

the confirmation of cervix dilatation and effacement and the extent of descent of the presenting part. The time taken by the descending of presenting part to +3 was recorded and the researchers would calculate the time variation for each subject in the descending of presenting part to +3.

Duration of different stages

This study used the duration of each labor stage and of total labor time as indicators of labor progression. The first stage of labor (cervical effacement and dilatation) was defined as the period during which uterine contractions of sufficient frequency, intensity, and duration were attained to dilate the cervix fully (about 10 cm). The second stage of labor (fetal expulsion) was defined as beginning once cervical dilatation is complete and ending with the delivery of the fetus. The third stage of labor (placenta expulsion) was defined as beginning immediately after fetus delivery and ending with the expulsion of the placenta and fetal membranes. In this study, the first stage of labor is defined as the time between the onset of true pain and full dilation of the cervix. Owing to the subjectivity of "true pain", besides the chief complaints of the beginning of regular contraction, we also asked subjects whether pain felt had the characteristics of true pain (e.g., intermittent, regular, if next contraction is predictable; what is the position of pain and the changes of pain during activities) and also observed whether cervix size was increasing.

Post-partum first bowel movement

The primary nurse inquired the time at which subjects experienced their first bowel movement following delivery. Time of first bowel movement was based on a 24 hour rule. Therefore, the "first day after delivery" means a full 24-hour period after delivery.

Episiotomy dehiscence rate

Daily records were kept to check that the suture to the approximation of the wound edges was complete.

Data Collection

When expecting women were hospitalized, the purpose of study and its procedure were explained to those who met sampling qualification criteria. They were included as study subjects if they agreed to participate. All subjects provided informed consent and understood how data collected was to be kept confidential, how personal information was to be protected, and how they retained the right to withdraw from the study at anytime. Before data was collected, researchers agreed upon common outcome

indicator definitions and proceeded with explanation and training in order to ensure consistency amongst collected and recorded data. All data was recorded and transferred to a pre-designed registration sheet. A senior nursing staff with nine years of clinical delivery room experience was responsible for recording and calculating relevant data before the subject was discharged from hospital following delivery. After that, another senior registered nurse examined data for correctness. In addition, we also checked data consistency against subject medical charts (e.g., puerperium observations evaluated and recorded by doctor) to confirm data correctness.

To avoid the Hawthorne effect, the data collection and analysis was conducted by various persons. The senior faculty of a school of nursing took primary responsibility for data analysis. Data recorded included: age, parity, time between membrane rupture to labor completion, duration of presenting part descent, first, second and third stage durations, total duration of labor, maternal body temperature recorded in the hospital, perineal wound assessments, infant body weight and temperature while in the hospital.

Results

Subject Group Profiles

Enema group: The average age of the enema group was 30.18 ± 4.03 years, with a gestational age of 38.80 ± 1.16 weeks. Slightly over half (54.5%) were primiparous and 45.5% were multiparous. A high school education was the highest level of education achieved by a plurality (33.7%) of subjects. The average time between membrane rupture and delivery was 243.39 ± 308.46 minutes (45.8% of membranes were ruptured artificially; 54.2% of membranes ruptured spontaneously). The majority of subjects (80.3%) gave birth naturally, followed by 19.7% who received vacuum extraction. Nearly all had second-degree perineal wounds (97.7%), followed by third-degree (1.9%) and fourth-degree (0.4%). The average body weight of newborn infants was 3151.17 ± 410.39 gm.

Non-enema group: The average age of the non-enema group was 29.98 ± 4.63 years, with an average gestational age of 38.86 ± 1.31 weeks. More than half (55.9%) were primiparous and 44.1% were multiparous. A plurality were junior college educated (34.2%). The average time between membrane rupture and delivery was 262.93 ± 304.56 minutes (51.1% of membranes were ruptured artificially; 48.9% of membranes ruptured spontaneously). The majority (81.1%) gave birth naturally, while 18.9% underwent vacuum extraction. Most (97.8%) had second-degree perineal wounds, with 1.5% experiencing fourth-degree and

1.1% experiencing third-degree wounds. The average body weight of newborn infants was 3182.44 ± 453.05 gm.

The profiles of the two groups were statistically comparable (Table 1).

Infection Rates for the Mother and Newborn during the Hospital Stay

Infection was indicated when ear temperature exceeded 37.6 °C. Infection symptoms in the perineal wound included reddish, swelling, severe pain and discharge. Results indicate that no subject in either group experienced fever. Infants were determined to have an infection when either the ear temperature exceeded 37.6 °C or a visible infection on the umbilical cord required the use of antibiotics. Results indicate no difference in infection rates between the two groups.

The Duration to Appearance of Infant Head (Descent of Presenting Part)

The duration of presenting part descent was 608.86 ± 529.84 minutes for the enema group as compared to 657.43 ± 505.97 minutes for the non-enema group. While the duration was longer for the non-enema group, the difference did not reach statistical significance ($p > .05$) (Table 2).

Duration of Labor

With the exception of the second stage of labor, this study identified no significant difference between enema and non-enema groups in terms of labor duration. The duration for the enema group was 593.19 ± 445.02 min, 32.70 ± 34.44 min, and 5.59 ± 5.03 min for the first, second and third stage of labor, respectively, with a total labor duration of 617.16 ± 375.86 min. For the non-enema group, the

Table 1.
Research Subject Characteristics (N = 534)

Variable	Enema (n = 264)			Non-Enema (n = 270)			χ^2/t -test	p
	M ± SD	n	%	M ± SD	n	%		
Age (yr)	30.18 ± 4.03			29.98 ± 4.63			-0.54 ^a	.59
Gestational Age (wk)	38.80 ± 1.16			38.86 ± 1.31			-0.59 ^a	.55
Parity							0.10 ^b	.75
Primiparous		144	54.5		151	55.9		
Multiparous		120	45.5		119	44.1		
Education							0.30 ^b	.99
Primary school		10	3.8		11	4.1		
High school		89	33.7		85	31.6		
Junior college		88	33.3		92	34.2		
College		67	25.4		71	26.4		
Graduate school		10	3.8		10	3.7		
Duration of Rupture of Member (min)	243.39 ± 308.46			262.93 ± 304.56			0.74 ^a	.46
Mode of Rupture of Member							1.29 ^b	.26
AROM		76	45.8		188	51.1		
SROM		90	54.2		180	48.9		
Mode of Labor							0.06 ^b	.81
Natural birth		212	80.3		219	81.1		
Vacuum extraction		52	19.7		51	18.9		
Perineal Wound							2.28 ^b	.07
Second degree		258	97.7		263	97.8		
Third degree		5	1.9		3	1.1		
Fourth degree		1	0.4		4	1.5		
Infant Weight (gm)	3151.17 ± 410.39			3182.44 ± 453.05			0.84 ^a	.40

Note. AROM = artificial rupture of membrane; SROM = spontaneous rupture of membrane.

^a: t-test. ^b: χ^2 .

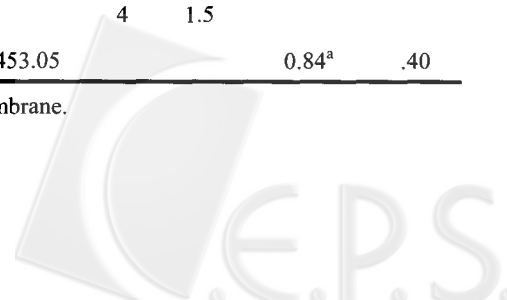


Table 2.
Duration of Presenting Part Descent

Variable	Enema (n = 264)		Non-Enema (n = 270)		t-test	p
	M ± SD		M ± SD			
Duration of presenting part descent + 3 (min)	608.86 ± 529.84		657.43 ± 505.97		1.08	.28

duration of labor was 570.02 ± 365.52 min for the first stage of labor and 40.77 ± 40.96 min for the second stage and 6.36 ± 6.39 min for the third stage of labor, with a total time of 631.48 ± 456.03 min. The relatively longer first stage of labor for the non-enema group did not reach statistical significance, indicating that enemas do not hasten labor in the first stage. However, the second stage of labor was significantly shorter for the enema group than the non-enema group (*p* < .05). While the total labor duration was shorter for the enema group, the difference was not statistically significant (Table 3).

Post-partum First Bowel Movement and Rates of Episiotomy Dehiscence

In the enema group, 20.1% of women had their first bowel movement one day following labor, with 25.0%, 14.0% and 0.8% having their first bowel movement on the second, third and fourth day, respectively. Somewhat less than half (40.2%) of women did not report having a bowel movement during their post-partum hospital stay. By com-

parison, 23.3% of non-enema group subjects had their first bowel movement one day after labor, with 26.7%, 15.9% and 0.7% doing so on the second, third and fourth day, respectively. Similarly, a large portion of subjects in this group (33.3%) did not report having any bowel movement during their post-partum hospital stay. These results indicate no statistical difference between enema and non-enema group in regard to the time of first bowel movement (Table 4). Furthermore, no one in the two groups experienced episiotomy dehiscence related to bowel movements.

Discussion

This study found no case of mother or infant infection in either group. Prior research has also indicated the lack of significantly different infection rates between enema and non-enema groups (Enkin et al., 2000; Romney, 1982). Nonetheless, some research studies found cases of infant infections, although such infections may be attributable to sanitary problems in the maternal ward, the use of different

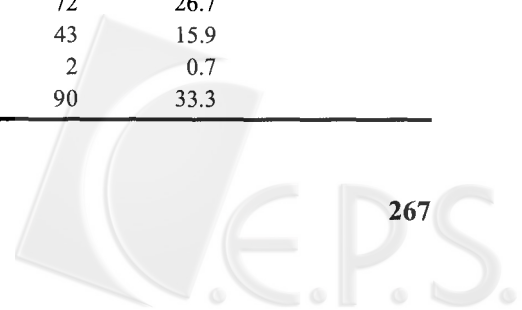
Table 3.
Duration of Various Labor Stages

Variables	Enema (n = 264)		Non-Enema (n = 270)		t-test	p
	M ± SD		M ± SD			
First stage	593.19 ± 445.02		570.02 ± 365.52		-0.66	.51
Second stage (min)	32.70 ± 34.44		40.77 ± 40.96		2.46	.01*
Third stage (min)	5.59 ± 5.03		6.36 ± 6.39		1.53	.13
Total (min)	617.16 ± 375.86		631.48 ± 456.03		-0.04	.69

**p* < .05.

Table 4.
Day of First Bowel Movement Following Labor

Variable	Enema (n = 264)		Non-Enema (n = 270)		χ ²	p
	n	%	n	%		
First day	53	20.1	63	23.3	2.81	.59
Second day	66	25.0	72	26.7		
Third day	37	14.0	43	15.9		
Fourth day	2	0.8	2	0.7		
No bowel movement during post-partum hospital stay	106	40.2	90	33.3		



disinfectants, (Drayton & Rees, 1984; Romney & Gordon, 1981) or different enema procedures (Cuervo et al., 2004).

The prevalence of puerperal fever and other complications during the 19th century likely gave rise to the popular use of routine enemas prior to labor due to the belief that infection rates could be reduced as a result. A prevalent belief among physicians at the time was that bowel movements soon after labor were the root cause of contamination and puerperal fever. Prophylactic intervention was recommended to prevent such, with physicians advised to administer enemas and shave pubic hair (Johnston & Baltimore, 1922; Wartz & Wertz, 1989). Although advances in medicine and improvements in sanitary conditions have greatly minimized the chances of infection, the use of enemas in the maternity ward is a deeply rooted practice in many physicians' routine. Despite WHO and American Mother-Infant League calls for the elimination of the enema in child delivery due to its lack of scientific basis, it remains in widespread use due largely to physician preference and habit (Cuervo et al., 2004; Kao, 2002).

While the historical shift from home birth to hospital delivery in Taiwan followed a different course from that of the United States, the objective of using enemas prior to labor was the same – to prevent infection. As sanitary conditions were not good during the early years of modern medicine in Taiwan, a great majority of hospitals applied enemas and pubic hair shaving as routine prophylactic procedures intended to prevent infections. Sanitary conditions have since improved greatly and puerperal fever incidences have been greatly reduced. Even with these advances, however, many hospitals continue to administer enemas. Kantor indicated as early as 1965 that it medical practices are difficult to change once they are deeply rooted (Kantor, Rembert, Tabio, & Buchanon, 1965). Yeh (2002) also pointed out that change in many entrenched medical practices, including the giving of enemas prior to labor, face great physician resistance. It is highly likely that the practice of administering enemas prior to labor is also closely related to the other common practice of performing episiotomies during labor. Although the efficacy of episiotomies has been called into question, enemas prior to labor are still considered beneficial to preventing episiotomy wound infections and reducing the pressure that bowel movements may place on the perineal wound following delivery. These are the reasons underpinning the continuing practice of enemas in the maternity ward. The reduction or elimination of enemas can only be realized when sufficient evidence exists of no significant difference in infection rates or perineal wound incidences. Our study

clearly shows no difference between our two groups in terms of these two issues.

Study results also demonstrated no statistical difference in time required for presenting part descent or first stage labor duration. Previous studies have lacked precise calculations of presenting part descent time, making the argument for or against administering enemas difficult. This study gathered presenting part descent duration data and found no statistical difference between the two groups.

Although the duration of second stage was shorter for the enema group, there was no statistically significant difference between the two subject groups in terms of the first, third and total labor periods. Such findings undercut the prevalent belief that enemas stimulate uterine contraction and facilitate emergence of the presenting part. Our findings add fuel to doubts regarding the efficacy and necessity of performing enemas as a routine part of child delivery. Others have reported similar findings (Lopes, Silva, & Christoforo, 2001; Rutgers, 1993). Whether study results are significantly affected by the use of low volume enemas remains to be determined. In addition, while our study also observed that the use of enemas increase the chances watery feces, we found no increase in perineal wound infection rates. It is a routine practice in the hospital studied to administer laxatives to mothers following labor. It is unclear whether this is a factor in the lack of difference in first bowel movement timing.

The fact that our study included both primipara and multipara mothers likely caused labor stage duration values to have wider variations than if the study population was either one or the other. Results also indicated that the mean of presenting part descent duration is longer than the mean of duration for the total stage of labor. This may be attributable to the fact that the hospital administered the enema routine immediately upon hospital admittance. As a result, while the measurement of time for the presenting part descent was calculated from hospitalization to the presenting part descent + 3, the measurement of first stage of labor (total stage of labor) began from the onset of true pain. As some of the subjects in this research were full-term induction, their true pain had not yet begun at time of admission. This may result in a duration of presenting part descent value larger than the total stage of labor value.

Addressing mothers' feeling and wishes regarding a pre-labor enema is an important issue. Medical staffs should pay attention to mothers' wishes and discuss with them the pros and cons of the procedure. Some mothers do not mind the procedure while others are apprehensive. Some mothers are concerned with the possibility of having a bowel movement during labor, which would be an embarrassment for them. As a consequence, those women would

elect to have enema prior to labor even in the absence of any medical benefit. Drayton and Rees (1984) suggested that it is necessary to evaluate the mother's bowel movements at the time of hospital admission and ask their wishes with regard to taking an enema prior to labor (Drayton & Rees, 1984). Medical staffs should understand and accept that having bowel movement during labor is a physiological phenomenon and, as such, should be accepted as a natural act in order to ease a mother's embarrassment.

After conducting research on humanized birth with 24 grassroots birth activist groups, Goer observed that the obstacle to humanized birth is closely tied to the entrenched power of obstetricians. Obstetricians, as a group, resisted the introduction of evidence-based, humanistic care (Goer, 2004). In promoting humanized birth in Taiwan, it is necessary to consider the women's health need and address the need of eliminating routine, but not necessary, procedures (Kao, 2005; Wagner, 2001).

Conclusion

Enema prior to labor has been a routine procedure practiced for years in Taiwan. Much discussion in recent years has focused on reducing medical intervention, promoting humanized birth and returning to natural birthing methods. One of the several controversial issues related to enemas prior to labor is the prevention/reduction of episiotomy dehiscence. Our study results do not support the administering of enemas as a routine in labor. However, due to research method limitations, we suggest in the future the adoption of a more deliberate study method that will produce inferences that are more scientifically sound. We also suggest a future study should focus on the reduction of unnecessary medical interventions during labor as a way to promote humanized birth.

Limitation

The subjects of this research represent the result of a non-randomized sampling process. This non-random selection may affect negatively upon results and conclusions. We suggest in the future that a randomized clinical trial be adopted to control for confounding factors (e.g., laxative use, physical position during labor, and antibiotics use) that may affect research results.

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分娩前的灌腸：一個在台灣具爭議性的常規

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摘要：縱使爭議性不斷，灌腸卻仍為台灣許多醫療院所分娩準備的常規項目。由於普遍施行會陰切開術，預防糞便污染造成會陰傷口感染即成為贊成維持此項常規的主要理由。因此本研究旨在比較有無常規灌腸對產婦與新生兒產後住院期間的感染率、胎頭下降時間、產程時間、產後開始排便時間及會陰傷口裂開的差異，以作為是否繼續執行此項常規之參考。研究對象為 534 位至台灣中部某醫學中心生產之低危險妊娠婦女。其中前 6 個月 264 位產婦依原有常規執行灌腸，後 6 個月 270 位產婦則未施予灌腸。記錄並比較二組產婦及新生兒於生產及產後住院期間感染、產程進展及產後排便等變項之差異。結果發現無論有無灌腸，產婦與新生兒在產後住院期間皆未出現感染徵象、胎頭下降所需的時間亦無顯著差異。雖然灌腸組在第二產程的時間較非灌腸組短，且有統計上的差異，但二組在第一、三產程及總產程的時間長度方面則無顯著差異。此外，在產後排便的時間方面，未灌腸的產婦並未延遲其產後排便時間，或增加會陰傷口裂開的機率。依據本研究之結果生產過程並無常規執行灌腸的必要；但由於受到研究設計之限制，建議未來的研究可採隨機臨床試驗，以提昇結果的推論性。

關鍵詞：常規灌腸、分娩、人性化生產。

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