Lateral asymmetric decubitus position for the rotation of occipito-posterior positions: multicenter randomized controlled trial EVADELA

Camille Le Ray, MD, PhD; Flavie Lepleux, RM; Aurélie De La Calle, RM; Jessy Guerin, RM; Nathalie Sellam, RM; Michel Dreyfus, MD; Anne A. Chantry, RM, PhD

BACKGROUND: Fetal occiput posterior positions are associated with poorer maternal outcomes than occiput anterior positions. Although methods that include instrumental and manual rotation can be used at the end of labor to promote the rotation of the fetal head, various maternal postures may also be performed from the beginning of labor in occiput posterior position. Such postures might facilitate flexion of the fetal head and favor its rotation into an occiput anterior position.

OBJECTIVE: The purpose of this study was to determine whether a lateral asymmetric decubitus posture facilitates the rotation of fetal occiput posterior into occiput anterior positions.

STUDY DESIGN: Evaluation of Decubitus Lateral Asymmetric posture was a multicenter randomized controlled trial that included 322 women from May 2013 through December 2014. Study participants were women who labored with ruptured membranes and a term fetus that was confirmed by ultrasound imaging to be in cephalic posterior position. Women who were assigned to the intervention group were asked to lie in a lateral asymmetric decubitus posture on the side opposite that of the fetal spine during the first hour and encouraged to maintain this position for as long as possible during the first stage of labor. In the control group, women adopted a dorsal recumbent posture during the first hour after random assignment. The primary outcome was occiput anterior position at 1 hour after random assignment. Secondary outcomes were occiput anterior position at complete dilation, mode of delivery, speed of dilation during the active first stage, maternal pain, and women's satisfaction.

RESULTS: One hundred sixty women were assigned to the intervention group, and 162 women were assigned to the control group. One hour after random assignment, the rates of occiput anterior position did not differ between the intervention and control groups (21.9% vs 21.6%, respectively; P=.887). Occiput anterior rates did not differ between groups at complete dilation (43.7% vs 43.2%, respectively; P=.565) or at birth (83.1% vs 86.4%, respectively; P=.436). Finally, the groups did not differ significantly for cesarean delivery rates (18.1% among women in lateral asymmetric decubitus and 14.2% among control subjects (P=0.608) or for speed of cervical dilation during the active first stage of labor (P=.684), pain assessment (P=.705), or women's satisfaction (P=.326). No maternal or neonatal adverse effect that was associated with either posture was observed.

CONCLUSION: Lateral asymmetric decubitus position on the side opposite that of the fetal spine did not facilitate rotation of fetal head. Nevertheless, other maternal positions may be effective in promoting fetal head rotation. Further research is needed; posturing during labor, nonetheless, should remain a woman's active choice.

Key words: occiput posterior position, maternal posture, labor, cesarean delivery

Occiput posterior (OP) positions account for approximately 20% of fetal positions during labor and 5% at delivery.[1,2] Persistent OP at delivery is associated with poorer maternal outcomes than occiput anterior (OA) positions, in particular, higher rates of instrumental and cesarean delivery and severe perineal laceration.[3,4]

Three methods can be used to promote the rotation of the fetal head. Two of them, instrumental rotation and manual rotation, are associated with high success rates[5-10] but can be performed only at the end of the first or during the second stage of labor and may be associated with fetal and maternal complications. Another method that is used to facilitate fetal head rotation from the beginning of labor, in the first latent phase if necessary, is careful selection of maternal posture. These maternal postures seek to promote flexion of the fetal head to favor its rotation into the OA position.

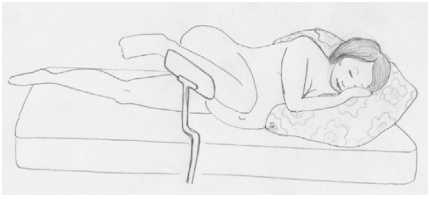
However, the level of evidence for these practices is low. Three randomized trials have assessed the effect of maternal postures. All reported negative results, however with limitations. The failure of Stremler et al[11] to demonstrate any benefit from the 1-hour hand-and-knees (or all-4s) posture may have been due to a lack of power, whereas the complex postural strategy proposed by Desbrière et al[12] was neither beneficial nor easily reproducible. In the intervention group of Guittier et al[13] trial, women were invited to adopt a hand-and-knees posture for a very short period (ie, at least 10 minutes); >80% of participants maintained the posture <30 minutes).

Mobilization can be difficult for women in labor with an epidural analgesia; some postures, such as the hand-and-knees, can be uncomfortable for parturients, especially for prolonged periods. The lateral asymmetric decubitus (LAD) posture, on the other hand, is easy, reproducible, and comfortable (Figure 1). We hypothesized that, under the effect of uterine contractility, LAD posture for a significant period (approximately 1 hour) favors fetal head

Cite this article as: Le Ray C, Lepleux F, De La Calle A, et al. Lateral asymmetric decubitus position for the rotation of occipito-posterior positions: multicenter randomized controlled trial EVADELA. Am J Obstet Gynecol 2016;215:511.e1-7.

0002-9378/$36.00
© 2016 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.ajog.2016.05.033

FIGURE 1
Lateral asymmetric decubitus posture



LAD, pronounced *lateral recumbent posture*, lying on the side opposite the fetal spine with the inferior leg positioned in the axis of the body and the upper leg hyperflexed.

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

flexion by confronting the fetal occiput with the maternal sacroiliac joint and delaying the contact between the forehead and the contralateral pubis. Flexion of the fetal head would then induce its anterior rotation.[12] Moreover, LAD is the most common posture used by French midwives during the first stage of labor for women with an epidural.[14] This maternal posture has been described in textbooks and taught to midwives and doctors in specific postural training sessions.[15] However, its use to rotate the fetal head has never been assessed specifically.

Our objective was to demonstrate that the LAD posture favors fetal head rotation from OP to OA position, by conducting a randomized controlled trial. Secondary objectives were to assess the effect of this posture on obstetric complications and women's satisfaction.

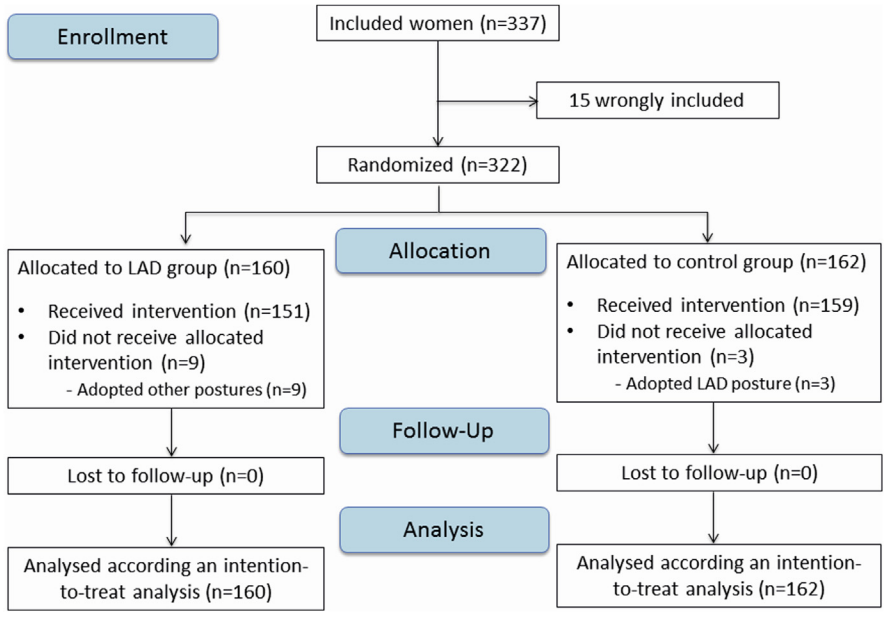
Material and Methods

Trial design

The EVADELA (Evaluation of Decubitus Lateral Asymmetric posture) trial was an open multicenter randomized controlled trial with 2 parallel groups, conducted in 4 French maternity units from May 2013 through December 2014.

Before the trial began, all participating midwives and obstetricians in each maternity unit received instruction in the protocol procedures and reviewed the LAD posture to ensure its consistency for all clinicians. One midwife was identified as the local study investigator in each center.

FIGURE 2
Flow chart of trial



LAD, lateral asymmetric decubitus.

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

Participants

Participants were recruited in 2 tertiary university maternity units (in Port-Royal, Paris: 5500 deliveries/year; in the Woman and Child Department of Caen Hospital, Normandy: 3000 deliveries/year), a level-2 maternity unit (Avranches-Granville, Normandy: 1300 deliveries/year), and a level-1 unit (Les Bluets, Paris; 3000 deliveries/year).

Eligible women were ≥18 years old, in labor with ruptured membranes, and with a singleton term fetus (≥37 weeks of gestation) in an OP position clinically diagnosed between 2 and 9 cm of cervical dilation and confirmed by transabdominal ultrasound imaging just above the symphysis, demonstrating the position of the fetal orbits, the falx, and the fetal spine. We excluded women with complications during pregnancy, small-for-gestational age fetuses, in utero fetal deaths, and those who did not understand French. We also excluded women who were using the LAD posture before inclusion and randomization.

Women first received information about the study during a prenatal visit in the third trimester of pregnancy from clinicians (midwives or obstetricians). Fliers about the study were also posted in each maternity unit. This information was repeated in the delivery room for women in labor when the clinician determined that the fetus was in an OP position. When this diagnosis was confirmed by the ultrasound examination (paper printouts of the ultrasound examinations were provided), women were asked to confirm their participation and provide written consent. After inclusion, they were assigned randomly to the intervention or the control group.

Intervention

In the intervention group, women were postured in the LAD posture for the first hour after randomization (a minimum of 30 minutes required; Figure 1). LAD was a pronounced lateral recumbent posture, lying on the side opposite that of the fetal spine (eg, right maternal lateral position for left fetal spine) with the inferior leg positioned in the axis of the body and the upper leg hyperflexed

(spine-femur angle, <90 degrees) with the shin propped up on a stirrup. Because maternal posture should be maintained for a significant length of time to be efficient, we chose a 1-hour posture. After the first hour after randomization, women were encouraged to maintain this posture as long as possible during the first stage of labor.

In the control group, women used the dorsal recumbent posture for the first hour after randomization and were then encouraged to maintain it for as long as possible during labor. If women wanted to change their posture later in labor or if they needed to because of fetal heart rate (FHR) abnormalities, they could take any position except LAD.

In both groups, once dilation was complete, midwives and obstetricians could recommend other maternal postures or attempt manual rotation, according to the unit's regular practices.

Each participating clinician received a didactic protocol with a description of each stage of the study and an illustration of the LAD posture; the protocol was also posted in the labor ward.

Outcomes

The primary outcome was the rate of OA position of the fetal head 1 hour after randomization, clinically diagnosed and confirmed by ultrasound imaging (paper printouts of ultrasound examinations provided). The fetal head position was classified into 1 of 3 categories: OA position (including right and left OA positions), occiput transverse position (right and left), and OP position (including right or left OP positions). For women who gave birth before the end of the first hour after randomization, we considered the fetal head position at birth as the fetal head position for this outcome.

The main secondary outcomes were the frequency of the OA position at complete cervical dilation (confirmed by an ultrasound examination) and at delivery. Manual fetal head rotations that were performed at complete cervical dilation were recorded. For women who gave birth before complete dilation, we considered the fetal head position at complete dilation to be missing.

TABLE 1
Maternal and obstetrical characteristics according to study group

Characteristic	Group	
	Lateral asymmetric decubitus (n=160)	Control (n=162)
Age, y[a]	29.9±0.4	30.1±0.4
Primiparous, n (%)	122 (76.2)	124 (76.5)
Body mass index before pregnancy, kg/m^2[a]	23.5±0.3	22.8±0.3
Smoker, n (%)	27 (16.9)	23 (14.2)
Hospitalized >24 h during pregnancy, n (%)	12 (7.5)	15 (9.3)
Placental location, n (%)		
Anterior	51 (31.9)	49 (30.2)
Posterior	97 (60.6)	93 (57.4)
Lateral	2 (1.2)	5 (3.1)
Fundal	6 (3.8)	6 (3.7)
Not available	4 (2.5)	9 (5.6)
Gestational age, wk[a]	39.7±0.1	39.4±0.1
Cervical dilation		
At inclusion, cm[a]	5.5±0.1	5.4±0.1
<5 cm, n (%)	51 (31.8)	49 (30.2)
Fetal position at inclusion, n (%)		
Right occiput posterior	95 (59.4)	93 (57.4)
Left occiput posterior	48 (30.0)	44 (27.2)
Occiput posterior	17 (10.6)	24 (14.8)
Not available	0	1 (0.6)
Fetal station at inclusion, n (%)		
−5 to −3	7 (4.4)	5 (3.1)
−2 to −1	124 (77.5)	131 (80.9)
0	29 (18.1)	26 (16.0)
Oxytocin use at inclusion, n (%)	60 (37.5)	68 (42.0)
Epidural at inclusion, n (%)	144 (90.0)	145 (89.5)
Cervical dilation at epidural placement, cm[a]	3.5±0.1	3.3±0.1

[a] Data are given as mean±standard deviation.

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

Maternal secondary outcomes were speed of cervical dilation during labor (centimeters/hour), length of expulsive efforts (minutes), mode of delivery (spontaneous, instrumental, or cesarean), perineal lacerations in vaginal deliveries (episiotomy or third- and fourth-degree lacerations), hyperthermia (temperature, ≥38°C), postpartum hemorrhage (blood loss, ≥500 mL), and severe postpartum hemorrhage (defined as a blood loss >1000 mL or the need for a supplementary uterotonic treatment, uterine balloon tamponade, arterial embolization, uterine artery ligation, or hysterectomy).

Neonatal outcomes included umbilical arterial pH at birth, 5- and 10-minute Apgar scores, neonatal resuscitation (ventilation or intubation), and transfer to neonatal intensive care unit. Moreover, gestational age at birth, sex, weight, height, and head circumference of neonates were also recorded.

TABLE 2
Fetal position at 1 hour after randomization at complete cervical dilation and at birth, according to study group

Variable	Group		*P* value
	Lateral asymmetric decubitus (n=160), n (%)	Control (n=162), n (%)	
Fetal position at 1 hour after randomization			.887
Occipito-anterior	35 (21.9)	35 (21.6)	
Occipito-transverse	17 (10.6)	14 (8.6)	
Occipito-posterior	104 (65.0)	110 (67.9)	
Not available	4 (2.5)	3 (1.8)	
Fetal position at complete cervical dilation			.565
Occipito-anterior	70 (43.7)	70 (43.2)	
Occipito-transverse	18 (11.3)	18 (11.1)	
Occipito-posterior	50 (31.3)	59 (36.4)	
Not available	22 (13.7)	15 (9.3)	
Fetal position at birth			.436
Occipito-anterior	133 (83.1)	140 (86.4)	
Occipito-transverse	4 (2.5)	1 (0.6)	
Occipito-posterior	20 (12.5)	20 (12.4)	
Not available	3 (1.9)	1 (0.6)	

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

Safety outcomes included the rate of FHR assessments that were considered to be of poor quality (satisfactory/acceptable/unsatisfactory) and the frequency of FHR signal loss (<10%, 10-25%, 25-50%, >50%) during the first hour after randomization. In this study, as in France in general, FHR was monitored continuously throughout labor. Finally, women's satisfaction was assessed with questions about the comfort of the posture (very comfortable/comfortable/not really comfortable/uncomfortable) and pain intensity at 1 hour after randomization (using the Visual Analogue Scale).

To assess the comparability of the 2 groups, the following maternal characteristics were compared: age, parity (primiparous/multiparous), gestational age at birth, prepregnancy body mass index, geographic origin, and educational level. Other factors that might have an effect on the fetal head position or its rotation were also collected: cervical dilation at randomization, placental location, fetal head station, induction of labor (spontaneous/induced), oxytocin use, and epidural.

Midwives and obstetricians random assigned the women and conducted the vaginal and ultrasound examinations at inclusion, at the end of the first hour after randomization, and at complete cervical dilation. They also prospectively collected fetal head position at birth and details about the postures that were used by each woman (number and description of each) and about manual rotation and FHR signal loss. A research assistant independent of the local medical team collected other data from the medical charts: compliance with the inclusion criteria and the randomization procedure. Another independent research assistant who was used only for the data monitoring checked the quality of data for all participants.

Sample size

We estimated the number of patients necessary based on OA position rates at the end of the 1-hour study period close to those reported by Stremler et al.[11] Thus, we hypothesized that the rate of OA fetal head positions 1 hour after randomization would be 15% in the intervention group vs 5% in the control group. To show this difference with a bilateral test, a power of 80% (1-β), and an alpha risk of .05, the study required the inclusion of 160 women in each group, for a total of 320 participants with a 1:1 ratio.

Randomization

As soon as the written consent was signed, the randomization was performed by an automated web-based system to ensure allocation concealment (24-hour accessibility with personal login and password: Cleanweb software; Telemedicine Technologies S.A, Boulogne-Billancourt, France). Allocation was based on permutated blocks of 4 and was stratified by center and parity (primiparous/multiparous). This strategy was not known by local investigators.

Statistical methods

The data analysis was conducted, and the manuscript written in accordance with the Consolidated Standards of Reporting Trials guidelines. The 2 groups were compared for the main and secondary outcomes in an intention-to-treat analysis. For dichotomous variables, proportions were calculated, and chi^2 and Fisher exact tests were used as appropriate to assess differences in outcomes between groups. For continuous variables, we calculated means and their standard deviations and used Student and nonparametric tests to compare the outcomes between groups. Rates of episiotomy or perineal lacerations and the mean duration of expulsive efforts were calculated only among women with vaginal deliveries. The *speed of cervical dilation* was defined as mean cervical dilation measured in centimeters per hour of labor and calculated with the following formula: (10−cervical dilation at inclusion)/(time at complete

dilation−time at inclusion) for both the subgroups of women with vaginal and cesarean deliveries. We stratified the primary and secondary fetal position outcomes according to the fetal position category at inclusion (right or left OP or OP), cervical dilation at inclusion, and the actual duration for which the women in the intervention group maintained the LAD position for the first hour.

The effect of the LAD position was assessed globally and for each center. A Mantel-Haenszel homogeneity test was performed to assess the consistency of the main outcome across all the 4 centers and according to parity. Significance was defined as a probability value of <.05. Analyses were performed with Stata software (version 10SE; Stata Corporation, College Station, TX).

Ethics and registration

The Ile-de-France XI Committee for the Protection of Persons (Ethics committee) approved the trial protocol in February 2013 (n°13011). It has been registered in the Clinical Trials database (ClinicalTrials.gov): number: NCT01854450.

Results

During the study period, 337 women were included, and 322 women were allocated randomly to the intervention group (LAD group; n=160) or the control group (n=162; Figure 2). Fifteen women provided the written consent and were included in the web-based system but were not assigned randomly because they did not fill the inclusion criterions. In the intervention group, all women, except 5 (3.1%), maintained LAD posture at least 30 minutes; the median of the length of LAD posture during the first hour after randomization was 60 minutes (interquartile range, 45−60 minutes). Five women gave birth in <1 hour after randomization (3 in the LAD group and 2 in the control group). The mean duration of LAD for the 3 in the intervention group was 35±5 minutes. Of the 160 women allocated to the LAD group, only 9 women (5.6%) used another posture. Similarly, 3 women (1.9%) in the control group used the LAD posture.

TABLE 3
Maternal and neonatal secondary outcomes

Outcome	Group: Lateral asymmetric decubitus	Group: Control	*P* value
Maternal			
Speed of dilation during the active phase of labor, cm per hour[a]	2.5±0.2	2.6±0.2	.684
Mode of delivery, n (%)			.608
Spontaneous vaginal	97 (60.6)	105 (64.8)	
Instrumental vaginal	34 (21.2)	34 (20.9)	
Cesarean	29 (18.1)	23 (14.2)	
Episiotomy (if vaginal delivery)	29 (22,1)	39 (28.1)	.263
3rd/4th Degree laceration (if vaginal delivery), n (%)	2 (1.5)	2 (1.4)	.998
Hyperthermia during labor, n (%)	19 (11.9)	22 (13.6)	.646
Postpartum hemorrhage >500 mL, n (%)	16 (10.0)	18 (11.1)	.746
Neonatal			
Birthweight, g[a]	3463±35.5	3443±34.9	.681
Apgar score			
At 5 min[a]	9.8±0.0	9.8±0.1	.790
<7 at 5 min, n (%)	1 (0.6)	4 (2.5)	.371
Arterial pH			.863
At birth[a]	7.23±0.0	7.23±0.0	
<7.10, n (%)	7 (4.4)	9 (5.6)	.626
Neonatal intensive care unit transfer, n (%)	8 (5.0)	7 (4.3)	.798

[a] Data are given as mean±standard deviation.

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

Maternal and obstetric characteristics at inclusion were similar in the 2 groups (Table 1).

Data for the principal outcome, fetal head position 1 hour after randomization, were available for 315 participants (97.8%): the percentage of women with fetuses in OA position did not differ between the LAD and the control groups (respectively, 21.9% vs 21.6%; *P*=.887; Table 2). There was no significant heterogeneity between centers (Mantel-Haenszel test; *P*=.730) for this outcome.

Furthermore, the OA rates did not differ significantly between the intervention and control groups at complete cervical dilation (43.7% vs 43.2%, respectively; *P*=.565) or at birth (83.1% vs 86.4%, respectively; *P*=.436) or between groups in the stratified analyses according to fetal position category at inclusion, cervical dilation at inclusion, or duration of LAD during the first hour after randomization.

Similarly, secondary outcomes did not differ between the 2 groups (Table 3). The mode of delivery and cervical dilation at the moment of cesarean delivery were not significantly different.

Among women with a fetus in persistent OP position at complete cervical dilation, 99 women (68.3%) had a manual rotation; the success rate was 75.8% (75/99 women).

TABLE 4
Pain, women's comfort, and fetal heart rate assessment, according to study group

Variable	Group		*P* value
	Lateral asymmetric decubitus (n=160)	Control (n=162)	
Maternal pain at H1 (Visual Analogue Scale)[a]	1.5±0.2	1.4±0.2	.705
Women very or comfortable during the first hour, n (%)	120 (75.0)	123 (75.9)	.326
Poor assessment quality of fetal heart rate monitoring during the first hour, n (%)	7 (4.9)	1 (0.7)	.014
Signal loss >25% during the first hour, n (%)	8 (5.0)	3 (1.8)	.045

[a] Data are given as mean±standard deviation.

Le Ray et al. Maternal position for the rotation of fetal head. Am J Obstet Gynecol 2016.

Neonatal outcomes did not differ in the 2 groups. No neonatal trauma was reported (Table 3).

Neither the pain assessment at 1 hour after randomization nor women's comfort differed between groups (Table 4). LAD was associated, however, with a poorer assessment of the quality of FHR monitoring and a proportion of signal losses >25% during the first hour after randomization in the intervention group (5% vs 1.8%, respectively; *P*=.045).

Comment

In the EVADELA multicenter randomized trial, we found that a maternal LAD posture, lying on the side opposite that of the fetal spine, had no significant effect on the rotation of the fetal head from the OP to the OA position. Thus, this posture does not solve the challenge of how to rotate OP fetal positions during labor.

The LAD posture is an interesting position because it is easy to maintain by women during labor. Mobilization of women in labor with an epidural analgesia is sometimes difficult, and some postures (such as hand-and-knees) can be difficult for women in labor to maintain. In the recent trial published by Guittier et al,[13] for example, where most of women had epidural analgesia (>96%), >80% of them did not maintain this posture for > 30 minutes. This trial failed to demonstrate an impact of maternal posture to rotate fetal head. The short duration of the maternal posturing could be an explanation for this negative result. Because fetal head rotation probably is induced by the combination of maternal posture and uterine contractility, we considered that an effective posture should be maintained for a significant length of time (ie, >15 or >30 minutes, ideally at least 1 hour) to be associated with a significant number of uterine contractions.

The use of epidural analgesia during labor is continuing to increase worldwide. In France where the epidural rate exceeds 85%, the LAD posture is the position used most often by women in labor; 68% of French midwives report recommending using this posture to women during active labor.[14,16] Despite the lack of specific data, LAD appears to be used in several other countries.

Moreover, in view of the general lack of evidence about the benefits of maternal postures for rotation of the fetal head from the OP to the OA position, we wanted to assess a unique and reproducible posture such as LAD. Thus, we obtained clear results about this posture's value. The assessment in the trials by Guittier et al[13] and Desbrière et al[12] of several different postures (6 variants of hand-and-knees postures in the former and 3 postures in the latter) probably limited both the interpretation and reproducibility of their results. The postures proposed by Desbrière et al varied according to fetal head station.[12] It has been demonstrated clearly, however, that the estimation of station as a method for determining the level of the fetal head in labor is imprecise and inadequately reproducible.[17] Implementation of so complex a maternal posturing strategy based on fetal head station appears less than useful, especially given that their results did not demonstrate any benefit for fetal head rotation.

Nonetheless, we do not think that the negative results of the trials on this topic thus far constitute a sufficient reason to abandon consideration of postures and mobilization during labor. Results from several recent studies have concluded that mobilization during labor is associated with better maternal outcomes. For example, a French prospective observational study that included >1900 women reported that women with "active births" had a shorter labor and a lower cesarean delivery rate than the control group of inactive women.[18] *Active birth* was defined as a change in posture and/or a bath and/or walking during the latent phase of labor, followed by at least 3 changes in maternal posture during the active phase.[18] Moreover, a Cochrane collaboration meta-analysis that included 25 trials concluded that walking and an upright position in the first stage reduces the length of labor and the risk of cesarean delivery.[19] Although these studies did not specify fetal head position, our hypothesis is that walking and upright positions might well favor rotation of the fetal head in the first stage of labor and thus shorten this stage. This mechanism might also explain the reduced risk of cesarean delivery shown in this meta-analysis, especially the risk of a cesarean delivery for dystocia, known to be higher in OP fetal positions.[3] These results should encourage physicians and midwives to continue to assess of the benefits of maternal mobilization and postures on the rotation of the fetal head and on other obstetric outcomes.

Instrumental and manual rotations remain 2 options to avoid delivery in OP positions. Although rotational forceps

appear to be making a comeback, the maternal and neonatal complications that are associated with this method make it questionable.[5,7,8] None of the obstetricians in the EVADELA trial used instrumental rotations. Conversely, manual rotation was used frequently and successfully (approximately 75%) in the second stage of labor in persistent OP positions. No adverse outcomes (prolapsed cord or FHR abnormalities) were reported. This practice may explain the lower rate of OP position at delivery that was observed in our trial compared with the previous 2 trials; Stremler et al[11] reported 25% of fetuses were in OP position at delivery, and Desbriere et al[12] reported 22%. Observational studies have demonstrated that manual rotation is a safe and effective method to rotate the fetal head.[10] It may also decrease the rate of operative deliveries compared with expectant management.[9,20,21] However, no randomized controlled trial that has assessed manual rotation has yet been published. Two trials are currently underway, 1 in Australia[22] and the other in France (Marseille). They may finally resolve the issue of how to rotate the fetal head out of persistent OP position.

In conclusion, LAD posture on the side opposite that of the fetal spine did not facilitate rotation of the fetal head or modify either mode of delivery or maternal satisfaction. Further studies that will assess obstetric techniques to promote fetal head rotation are needed. Despite this, women should be encouraged to choose and change postures during labor according to their wishes. ■

Acknowledgments

We thank all the women who agreed to participate in the EVADELA trial and the midwives who recruited and included them; the sponsor was Assistance Publique-Hôpitaux de Paris (Département de la Recherche Clinique et du Développement). We thank URC-CIC Paris Descartes Necker/Cochin (Laurence Lecomte) for implementation and monitoring of the study and Dr Judith Abric for the illustration.

References

1. Gardberg M, Laakkonen E, Salevaara M. Intrapartum sonography and persistent occiput posterior position: a study of 408 deliveries. Obstet Gynecol 1998;91:746-9.

2. Lieberman E, Davidson K, Lee-Parritz A, Shearer E. Changes in fetal position during labor and their association with epidural analgesia. Obstet Gynecol 2005;105:974-82.

3. Fitzpatrick M, McQuillan K, O'Herlihy C. Influence of persistent occiput posterior position on delivery outcome. Obstet Gynecol 2001;98:1027-31.

4. Cheng YW, Shaffer BL, Caughey AB. The association between persistent occiput posterior position and neonatal outcomes. Obstet Gynecol 2006;107:837-44.

5. Stock SJ, Josephs K, Farquharson S, et al. Maternal and neonatal outcomes of successful Kielland's rotational forceps delivery. Obstet Gynecol 2013;121:1032-9.

6. Tempest N, Hart A, Walkinshaw S, Hapangama D. Authors' response to: The role of rotational forceps. BJOG 2013;120:1438-9.

7. Tempest N, Hart A, Walkinshaw S, Hapangama DK. A re-evaluation of the role of rotational forceps: retrospective comparison of maternal and perinatal outcomes following different methods of birth for malposition in the second stage of labour. BJOG 2013;120:1277-84.

8. Bahl R, Van de Venne M, Macleod M, Strachan B, Murphy DJ. Maternal and neonatal morbidity in relation to the instrument used for mid-cavity rotational operative vaginal delivery: a prospective cohort study. BJOG 2013;120:1526-32.

9. Le Ray C, Deneux-Tharaux C, Khireddine I, Dreyfus M, Vardon D, Goffinet F. Manual rotation to decrease operative delivery in posterior or transverse positions. Obstet Gynecol 2013;122:634-40.

10. Le Ray C, Serres P, Schmitz T, Cabrol D, Goffinet F. Manual rotation in occiput posterior or transverse positions: risk factors and consequences on the cesarean delivery rate. Obstet Gynecol 2007;110:873-9.

11. Stremler R, Hodnett E, Petryshen P, Stevens B, Weston J, Willan AR. Randomized controlled trial of hands-and-knees positioning for occipitoposterior position in labor. Birth 2005;32:243-51.

12. Desbriere R, Blanc J, Le Du R, et al. Is maternal posturing during labor efficient in preventing persistent occiput posterior position? A randomized controlled trial. Am J Obstet Gynecol 2013;208:60.e1-8.

13. Guittier MJ, Othenin-Girard V, de Gasquet B, Irion O, Boulvain M. Maternal positioning to correct occiput posterior fetal position during the first stage of labour: a randomised controlled trial. BJOG 2016. Jan 24. http://dx.doi.org/10.1111/1471-0528.13855. [Epub ahead of print]

14. Barasinski C, Debost-Legrand A, Vendittelli F. Survey on the practices of French midwives during delivery. Poster 955 International Federation of Gynecology and Obstetrics XXI FIGO World Congress; Vancouver, Canada. Available at: http://www.postersessiononline.eu/pr/aula_poster.asp. Accessed June 14, 2016.

15. De Gasquet B. [Trouver sa position d'accouchement.] Paris: Hachette Livre (Marabout); 2010.

16. Blondel B, Lelong N, Kermarrec M, Goffinet F. Trends in perinatal health in France from 1995 to 2010: results from the French National Perinatal Surveys. J Gynecol Obstet Biol Reprod (Paris) 2012;41:e1-15.

17. Buchmann E, Libhaber E. Interobserver agreement in intrapartum estimation of fetal head station. Int J Gynaecol Obstet 2008;101:285-9.

18. Lepleux F, Hue B, Dugue AE, Six T, Riou C, Dreyfus M. [Obstetric data in a population with postural changes during labor and delivery]. J Gynecol Obstet Biol Reprod (Paris) 2014;43:504-13.

19. Lawrence A, Lewis L, Hofmeyr GJ, Styles C. Maternal positions and mobility during first stage labour. Cochrane Database Syst Rev 2013;8:CD003934.

20. Reichman O, Gdansky E, Latinsky B, Labi S, Samueloff A. Digital rotation from occipito-posterior to occipito-anterior decreases the need for cesarean section. Eur J Obstet Gynecol Reprod Biol 2008;136:25-8.

21. Shaffer BL, Cheng YW, Vargas JE, Caughey AB. Manual rotation to reduce caesarean delivery in persistent occiput posterior or transverse position. J Matern Fetal Neonatal Med 2011;24:65-72.

22. Graham K, Phipps H, Hyett JA, et al. Persistent occiput posterior: outcomes following digital rotation: a pilot randomised controlled trial. Aust N Z J Obstet Gynaecol 2014;54:268-74.

Author and article information

From the Port-Royal Maternity Unit, Cochin Hospital, AP-HP (Dr Le Ray and Ms De La Calle); Inserm UMR 1153, Obstetrical, Perinatal and Paediatric Epidemiology Research Team (EPOPé), Centre for Epidemiology and Statistics Sorbonne Paris Cité (CRESS; Dr Le Ray and Ms Chantry), DHU Risks in Pregnancy; and the Baudelocque Midwifery School, AP-HP, (Ms Chantry), Paris Descartes University; Pierre Rouquès—Les Bluets Maternity Hospital (Ms Sellam), Paris, France; the Department of Gynecology and Obstetrics, Caen University Hospital, Caen Basse-Normandie University (Dr Dreyfus and Ms Lepleux), Caen, France; and the Avranches-Granville Maternity Hospital (Ms Guerin), Granville, France.

Received March 3, 2016; revised May 2, 2016; accepted May 20, 2016.

Supported by a research grant from the French Ministry of Health (CRC12002) and was sponsored by the Département de la Recherche Clinique et du Développement de l'Assistance Publique—Hôpitaux de Paris.

The authors report no conflict of interest.

Corresponding author: Camille Le Ray, MD, PhD. camille.le-ray@aphp.fr