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Original Scientific Paper

EFFECTS OF EDUCATED LABOR ATTENDANT ON BIRTH PROCESS AND RELATED FACTORS

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SUMMARY – The aim was to evaluate the effects of educated labor attendant (ELA) to pregnant women on the delivery process, mother's delivery satisfaction, and postpartum parenting behavior. Study women were divided into two groups depending on whether an ELA was present during labor or not. Obstetric and neonatal outcomes, Postpartum Parenting Behavior Scale (PPBS), Labor Agentry Scale, and labor satisfaction rate were evaluated and compared in the intervention and control groups. A total of 252 pregnant women, 126 in each group, were included in the study. The rate of cesarean section, the need of systemic analgesic application and pain measurements were significantly lower in the study group compared to the control group ($p=0.01$, $p<0.001$ and $p<0.001$, respectively). The mean PPBS and Labor Agentry Scale scores were significantly higher in the study group compared to the control group ($p<0.001$). ELA accompanying pregnant women help them overcome their labor fear in every stage of delivery, and decrease the rate of cesarean section.

Key words: *Educated labor attendant; Birth support; Vaginal delivery; Parenting behavior; Labor agentry*

Introduction

Nowadays, all kinds of opportunities presented by technology and positive sciences are given to laboring women but their psychological satisfaction is usually ignored. Present conditions of a delivery room may decrease the feeling of trust and slow down the labor process by preventing active participation of a pregnant woman by affecting her emotional condition. Hospital environments can disrupt physiologic hormonal systems[1]. Physiologic hormonal changes in a pregnant woman during labor process (β endorphin, adrenaline, noradrenaline, oxytocin, and prolactin) affect delivery preparation, efficient and safe delivery, successful breastfeeding, and optimal mother-infant attachment[2].

Although labor support is a reliable intervention which is highly useful for mothers, fulfilling their individual requests during delivery and encouraging them to labor can be rarely possible in our crowded metropolitan hospitals today[3]. Increasing tendency of cesarean section rates in Turkey occurred at the same time when the increase of hospital labors[4]. The American College of Obstetricians and Gynecologists (ACOG) and Society for Maternal-Fetal Medicine (SMFM) declare that continuous presence of supporting staff is one of the most effective tools to improve labor and delivery outcomes such as reduction of primary cesarean section rate[5]. In developing

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countries, the increased rates of cesarean section still pose a major problem[6]. Continuous labor support by educated attendants apart from health professionals has been reported to result in lower cesarean section and pharmacological analgesic use and higher delivery satisfaction[7]. In this study, we aimed to assess whether participation of an educated labor attendant (ELA) for laboring women would improve delivery outcomes for both mother and her baby and enhance mother-infant interaction in the postpartum period by providing emotional, physical and cognitive support.

Materials and Method

Population and sampling

This prospective cohort study took place at the University of Health Sciences, Zekai Tahir Burak Woman's Health, Education and Research Hospital between February 1 and May 31, 2017. The project was approved by the University of Health Sciences, Ankara Numune Education and Research Hospital Ethics Committee (decree no: 1123/2016). The women accepting to participate in the study were informed about the study by a psychologist-midwife, chief of labor attendants. The study protocol was designed in accordance with the Declaration of Helsinki, and study women provided their written consent. The study included Turkish speaking healthy females with no active communication barriers and whose labor had started spontaneously. The inclusion criteria were nulliparous or multiparous women with a singleton live cephalic presentation, aged 18-45 years and gestational age 37-42 weeks in the beginning of active labor (cervical dilatation, 5 cm). Patients who had high-risk pregnancy (gestational diabetes, preeclampsia, oligohydramnios, polyhydramnios, intrauterine growth restriction), previously known chronic disease, use of medical drugs, previous cesarean section or a history of uterine scarring, pregnancies complicated by evidence for fetal congenital malformations, and multiple pregnancies were excluded from the study. Upon admission to the delivery room, all eligible pregnant women were invited to participate in the study.

Pregnant women were divided into two groups according to whether they demanded or not an ELA to accompany them during labor into study group and control group, respectively. Every pregnant woman in the study group had another pregnant woman matched by age, parity, gestational week and body mass index in the control group. Right after acceptance by the pregnant women, ELAs (delivery support staff) accompanied them to the delivery room.

The study had two stages. Eight ELAs were trained in the first stage. Individuals to be trained as ELAs were chosen among patient guidance staff with at least 5-year experience of voluntary work in the delivery room. The chosen staff were trained in communication skills, pregnancy and birth process, pain management and delivery room operations for five weeks. In the practical phase of training, the psychologist-midwife in the team was providing constant psychological and physical support to the pregnant women taken to delivery room, and the delivery support staff observed these activities. In the second stage, after 5-week theoretical and practical training, ELA primarily started to provide service to pregnant women by her own. The role of ELA was defined according to the employment contract of patient guidance staff as follows:

- meeting the pregnant woman transferred to the delivery room and tell her about the delivery room and things to be done while the pregnant woman is getting dressed and leaving her relatives;
- meeting the needs of the pregnant woman during labor, helping her preserve her privacy, convey her needs and requests to her relatives;
- supporting the pregnant woman while the midwives show her the required exercises for pain management and help her take the position;
- fulfilling the suitable personal requirements of the pregnant woman during labor; and
- accompanying the mother after delivery until she is transferred to her room and returned safely to her relatives.

The staff started to do every task and the experienced attendant provided psychological support. The required support for constant mobilization of the pregnant woman during labor phase, monitoring as needed, oral feeding, postpartum exercises and postpartum encouragement were provided by the psychologist-midwife, delivery room midwives and physiotherapist accompanied by ELA. All women were observed by the same doctor.

Data collection

Along with personal data, the following information was collected by the form that included 15 questions and filled out by the women: obstetric and gynecologic history, smoking, education level, employment status, marriage duration, whether pregnancy was unplanned or not, information about labor and delivery given during pregnancy, whether they took support or not during pregnancy, and information about the individuals who supported them.

The psychologist-midwife evaluated pain scores of all study participants in the two groups at 5 cm, 8-9 cm and complete cervical ripening. The pain scale perceived by the pregnant women was evaluated with the visual analog scale (VAS)[8]. Duration of the second and third stages of labor, duration of active labor, analgesic need during labor, and use of synthetic oxytocin for augmentation during labor were also recorded. The women who experienced severe labor pain and demanded analgesic treatment were given systemic obstetric analgesia. The active phase of labor starts when cervical dilatation is 5 cm and ends when it reaches 10 cm[9]. The second stage starts when cervical dilatation is 10 cm and ends with birth of the child. The third stage starts with birth of the child and ends with expulsion of the placenta and placenta attachments (umbilical cord and fetal membranes)[10].

Postpartum neonatal Apgar scores at the 1st and 5th minutes were recorded in all study women. After delivery, the psychologist-midwife evaluated all women by the Postpartum Parenting Behavior Scale (PPBS) and Labor Agentry Scale, and assessed their labor satisfaction level. PPBS was used to detect parenting behavior in the early postpartum period. PPBS evaluates attitudes of the mother towards the infant in the first 10 minutes after delivery; it has been validated in Turkey[11]. The observer records the present behavior with plus (+) and missing behavior with minus (-) sign. Each item is scored one (1) if it is observed and as zero (0) if it is not. Total scale score is a sum of the scores recorded for all items and it is between 0 and 6[12-14].

Puerperal women in both groups were visited by the researcher in the first 12 hours postpartum and then the Labor Agentry Scale was applied. The scale has been validated in Turkey and includes 28 items[15,16]. Four Likert type items expressed positive or negative feelings about labor.

Labor satisfaction was analyzed by asking a Likert type question all study women 12 hours after labor and was rated between 0 (not satisfied) and 10 (very satisfied). The mothers were called by phone a month after delivery and asked whether they continued breastfeeding or not.

Statistical analysis

For power calculation, we assumed to have reduced the rate of cesarean section in our institution by 50% (from 18% to 9%). To detect this difference, the sample size *per* group was calculated as at least 111 with one tailed sample comparison with 0.05 level of significance (alpha), yielding a power of 80%. In this study, 126 subjects were included in each group by presuming drop rate (Newton.stat.ubc.ca).

The Statistical Package for Social Sciences (SPSS 17) program was used on data analysis. Demographic and clinical characteristics of the cases were analyzed as descriptive. The results were expressed as mean ± standard deviation and minimum-maximum values. After being controlled with Kolmogorov-Smirnov test, data were compared between the groups with Student's t-test or Mann-Whitney U test. The χ^2-test and Fisher exact test were used for categorical variables. The level of statistical significance was set at $p<0.05$.

Results

A total of 252 pregnant women were divided into the intervention group of 126 pregnant women who were accompanied by ELAs and control group of 126 pregnant women who had routine health care. No significant difference was detected between the groups according to age, gravidity, parity, nulliparity, mean marriage duration, body mass index, education level, employment (housewife, employed), smoking, gestational weeks, cesarean indications, person who provided information about childbirth before delivery, induction need, breastfeeding after a month, second stage duration of labor, third stage duration of labor, active phase duration, 1st and 5th minute neonatal Apgar scores, neonatal intensive care application, and Labor Agentry Scale values ($p>0.05$ all) (Tables 1 and 2). In the study, 90.1% of the pregnancies were planned and there was no significant difference between the two

Table 1. Demographic characteristics, obstetric and neonatal outcomes of pregnant women in both groups

Variable	Study group (n=126)	Control group (n=126)	p
Age (years)	26.71±5.24	27.94±5.55	0.072
Gravidity	2 (1-5)	2 (0-7)	0.43
Nulliparity, n (%)	60 (47%)	67 (53%)	1
Body mass index (kg/m^2)	28.52±4.34	29.63±4.76	0.054
Smoking, n (%)	13 (10%)	18 (14%)	0.315
Low education level (<8 years)	59 (46%)	65 (52%)	0.487
Marriage duration (years)	3 (1-26)	3 (1-20)	0.595
Occupation, n (%)			
Housewife	103 (81%)	104 (82%)	1
Employed	23 (19%)	22 (18%)	
Information acquired about labor, n (%)	61 (48%)	57 (45%)	0.665
None	45 (37%)	43 (34%)	
Health professional	20 (15%)	26 (20%)	
Other (friend, mother, internet)			
Gestational week	39 (37-42)	39 (37-42)	0.938
Preterm rupture of membranes, n (%)	19 (15.1%)	30 (23.8%)	0.08
Delivery method, n (%)			0.01*
Cesarean section	8 (6%)	21(17%)	
Vaginal delivery	118 (94%)	105 (83%)	
Cesarean indications, n (%)			0.114
Cephalopelvic disproportion	3 (37%)	3 (16%)	
Fetal distress	2 (25%)	12 (66%)	
Stable act	3 (37%)	3 (16%)	
Systemic analgesic requirement, n (%) (pethidine HCl)	13 (10%)	40 (31%)	<0.001*
Requirement for oxytocin induction, n (%)	66 (52%)	85 (67%)	0.183
VAS (at 5 cm cervical dilatation)	5 (1-8)	6 (3-7)	<0.01*
VAS (at 8-9 cm cervical dilatation)	8 (0-10)	8 (5-12)	<0.001*
VAS (at full cervical dilatation)	10 (5-10)	10 (7-10)	<0.001
Labor phase 2 duration (minutes)	10 (3-25)	10 (3-30)	0.955
Labour phase 3 duration (minutes)	10 (3-20)	10 (5-25)	0.239
Active labor duration (hours)	3 (1-48)	2.5 (1-24)	0.211
Birth weight (g)	3275 455	3226 489	0.08
Apgar 1st score	8 (5-9)	8 (2-9)	0.806
Apgar 5th score	10 (7-10)	10 (5-10)	0.944
Hospitalization in NICU	3 (2%)	5 (4%)	0.593

*p<0.05, significant; VAS = visual analog scale; NICU = Neonatal Intensive Care Unit

Table 2. Results of postpartum questionnaires in the study and control groups

Characteristic	Study group (n=126)	Control group (n=126)	p
PPBS*	5.9	5.4	<0.001*
Labor satisfaction scale	9.53	8.67	<0.001*
Labor agentry scale	108.4	107.1	0.319
Breastfeeding a month after delivery	105 (97%)	103 (94%)	0.428

*p<0.05, significant; PPBS = Postpartum Parenting Behavior Scale

groups. Nearly half of the women (46.8%) stated that they did not take any information about delivery process, 13.1% stated that they did not take any support during pregnancy, and 27.4% stated that their husband supported them during pregnancy. There was no significant difference between the two groups in these parameters (p>0.05). The need of systemic analgesic application, rate of cesarean section, and pain measurements (at 5 cm dilatation, 8-9 cm and full dilatation of cervix) were found significantly lower in the intervention group compared to the control group (p<0.001, p=0.01 and p<0.001, respectively). It was detected that average PPBS and labor satisfaction scale scores were significantly higher in the intervention group compared to the control group (p<0.001) (Table 2).

Discussion

This study revealed that the pregnant women in the group with ELA had lower cesarean section rate, VAS pain scores, and analgesia administration during labor, and higher degrees of PPBS and delivery satisfaction scale compared to the routine care (control) group. The World Health Organization (WHO) declares that a cesarean section rate of 10%-15% would decrease maternal and fetal mortality[17]. In Turkey, the rate of cesarean section in all deliveries is 51%[5]. This ratio is high above the target suggested as 15% by the WHO[17]. The cesarean section rate, which was 14% in 1982, had a paradoxical tendency to increase despite the planned policies made to decrease it. The reason for this can be inaccurate description of the factors and inaccurate identification of the real reasons leading to increased cesarean section rate. The communication between pregnant women and health care staff is crucial to be able to acquire optimal maternal-fetal results in pregnancy care. However, since the number of nurses in our country is inadequate, we can observe that midwives mostly work in treatment services. Due to the inadequate number of qualified doctors and midwives able to provide satisfactory and qualified routine health care of patients, to solve the problems that may be caused by unprofessional approaches in individual communication, and to strengthen the bond between the patient and health care team, educated intermediate staff is required. The cesarean section rate in the group of pregnant women accompanied by ELA in pregnancies with a low-risk profile was found to be significantly lower than the cesarean section rate in the standard care group (6% *vs.* 17%, p<0.01). This ratio was even lower than the ratios recommended by the WHO. We made a preliminary study on only low-risk pregnancies; however, randomized prospective studies also covering high-risk pregnancies are needed in this area.

Labor pain is one of the most serious pain categories[18]. Labor pain can be augmented as a result of fear and stress, and can have a negative effect on the course of parturition[19]. In our study, when pain scores were compared between the two groups, the intervention group of women had significantly lower VAS pain scores during the active phase of labor in 3 scales. This may have been due to the enhancing effect of ELA on pain relieving massages, patient mobilization, and management of labor fear. We found that analgesic need during labor was lower in the intervention group. Some authors also found similar results for analgesic use[7,20].

Documentation and clinical tasks may make it difficult for nurses to attend all emotional and physical support needs of a laboring female. Maternal anxiety and fear of delivery also lead to loss of labor self-control of women, which increases the need of intervention[21,22]. In a Cochrane systematic review on continuous support during labor, investigators found

that continuous labor support by educated attendants apart from health professionals resulted in lower cesarean deliveries and pharmacological analgesic use and higher delivery satisfaction. It is reported that constant delivery support is more efficient in conditions where a hospital employee provides constant support or an individual from the social circle of the woman is not present and epidural analgesic is not routinely used. As the result of data analysis, it is reported that constant support staff during delivery has significant advantage for both mothers and neonates without causing any harm, and every pregnant woman should receive support during labor and delivery[7].

Assignment of a person from the woman's social circle is ideal and associated with her increased delivery satisfaction but training and education of delivery attendants is necessary for a healthy working environment[23]. Considering the need of an attendant for every woman in the delivery room, we trained our ELAs by training our staff working as patient guidance staff in the hospital because we thought that engagement of these attendants without training would have negative effects on the actions taken in the delivery room. As there is no definition of the attendant education apart from health professionals in our health care system, the staff we trained were the first in this field.

Educated labor attendant accompanying the pregnant woman in the delivery room until she is holding and breastfeeding her infant actually meets the requirement for the emotionally safe environment present in deliveries at home by performing the role of a family member. This intervention also supports early and unrestricted postnatal skin contact between the mother and the newborn. In our study, we found that delivery satisfaction in the ELA group was higher and the postpartum parenting behavior was better than the conventional group.

This is the first study in our country to assess whether participation of an ELA for laboring women will improve delivery outcomes for both the mother and her baby, as well as the postpartum parenting behavior. The main strengths of our study were prospective design and sufficient sample size. Wide spread of the ELA participation after a certification program developed by the Ministry of Health may increase our positive gains to increase vaginal delivery rates in our country and other developing countries. Utilization of a convenience sampling method was the main limitation of this study. Further prospective blinded randomized studies are needed to reveal the real effect of ELA support on maternal delivery satisfaction and postpartum parenting behavior.

As a result, supporting pregnant women during labor by an ELA resulted in decreasing the rate of cesarean section, the need of systemic analgesic application, and pain measurements. In countries with high cesarean section rates in particular, labor management by an ELA is an approach to increase the rate of vaginal delivery while positively influencing postpartum parenting behavior.

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Sažetak

UČINAK OBAZOVANE POROĐAJNE POMOĆNICE NA POROĐAJNI PROCES I S NJIM POVEZANE ČIMBENIKE

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Cilj je bio procijeniti učinak obrazovane porođajne pomoćnice (OPP) trudnicama na čin porođaja, majčino zadovoljstvo tim činom i roditeljskog ponašanja nakon porođaja. Žene uključene u istraživanje podijeljene su u dvije skupine ovisno o tome je li OPP bila prisutna pri porođaju ili ne. Opstetrički i neonatalni ishod, *Postpartum Parenting Behavior Scale* (PPBS), *Labor Agentry Scale* i stopa zadovoljstva činom porođaja procijenjeni su i uspoređeni između intervencijske i kontrolne skupine. Ukupno su u istraživanje uključene 252 trudnice, tj. 126 u svakoj skupini. Stopa carskog reza, potreba za primjenu sistemskih analgetika i mjerenje boli bili su značajno niži u intervencijskoj skupini u usporedbi s kontrolnom skupinom ($p=0,01$, $p<0,001$ i $p<0,001$). Srednja vrijednost zbroja PPBS i *Labor Agentry Scale* bila je značajno viša u intervencijskoj skupini u usporedbi s kontrolnom skupinom ($p<0,001$). Prisutnost OPP pomogla je trudnicama prevladati strah od porođaja u svakom stadiju porođaja dok je istodobno snizila stopu carskog reza.

Ključne riječi: *Obrazovana porođajna pomoćnica; Potpora u porođaju; Vaginalni porođaj; Roditeljsko ponašanje*