

Research Article

Effects of Obstetric Interventions During Labor on Birth Process and Newborn Health

Deniz Akyıldız¹ , Ayden Çoban² , Fazilet Gör Uslu³ , Ayten Taşpınar² ¹Department of Midwifery, Kahramanmaraş Sütçü İmam University, Faculty of Health Sciences, Kahramanmaraş, Turkey²Department of Midwifery, Faculty of Health Sciences, Aydın Adnan Menderes University, Aydın, Turkey³Efeler Aydın Maternity and Child Health Hospital, Aydın, Turkey

ORCID iDs of the authors: D.A. 0000-0001-8548-0485, A.Ç. 0000-0002-2189-2488, F.G.U. 0000-0002-1248-6867, A.T. 0000-0001-7918-2457.

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Abstract

AIM: This study aimed to investigate the effects of the interventions in the delivery room on the delivery process and the newborn health.**METHOD:** The analytical-cross-sectional study was carried out with 354 puerperal women who gave birth in hospital between December 2016 and June 2017 in a public hospital. The data were collected by the data collection form developed by the researchers. Data analysis was done by using descriptive statistics and chi-square test in SPSS 21.00 program.**RESULTS:** The interventions were determined in continuous electro fetal monitoring (80.5%), oxytocin induction (79.9%), restriction of free movement (56.8%), amniotomy (49.7%), enema (44.1%), and movement restriction (56.8%). The intervention period of the second phase of delivery was longer and the rate of cesarean section was higher, and the need for NICU, suction difficulty, 5th APGAR score less than 7, trauma development, difficulty in suction, and higher trauma rates were found in infants. It was determined that the rate of oxygen need in puerperals admitted to the delivery room with cervical dilatation below five cm, vacuum and episiotomy applications in those who underwent amniotomy, and vacuum application rates in those undergoing oxytocin inductions were found to be high. In addition, the rate of fundal compression and episiotomy was significantly higher in patients who used continuous electro fetal monitoring, fundal compression and vacuum rate in patients who were administered analgesic drugs, and episiotomy rates in patients using analgesic drugs.**CONCLUSION:** It has been concluded that interventions in the first phase of labor negatively affect the delivery process and neonatal health and increase the need for intervention in the second phase.**Keywords:** Childbirth, midwifery, newborn, pregnancy, Turkey

Introduction

Giving birth (laboring) is a perfectly normal physiological process, not a disease, that should be performed in its natural course (Darra, 2009; Hotelling, 2009). In the International Midwives Confederation, it was declared that birth is a physiological process and unless required midwives should avoid intervening the stage of laboring (The International Confederation of Midwives, 2012). Although in the past births mostly took place at homes, toward the end of 20th century, women began to give birth at hospitals (Kjærgaard et al., 2008). As an effect of this trend, giving birth then began to be classified as a medical problem that needed to be managed through various interventions (Van Der Hulst et al., 2004). In the stage of laboring, some of the ubiquitous interven-

tions are continuous Electro Fetal Monitorization (EFM), restricting food and drink intake, frequent vaginal examination, induction, enema, amniotomy, restricting the freedom of movement, epidural and regional anesthesia, taking analgesia to reduce birth pain, bladder catheterization, episiotomy, late and early push, forceps, suction, and cesarean (C/S) procedures (Arslan, 2012; Lawrence et al., 2013; Taşkın, 2014).

Lately, there has been a surge in the practice of widespread and routine birth interventions on a global scale. Roberts et al. (2000) in their study that included low-risk primipara and multipara reported that induction in 15.7% of primiparas, forceps in 10.5%, suction in 6.8%, epidural anesthesia in 25.1%, and episiotomy in 28.6% was performed. In

the same study, it was also reported that similar to primiparas, intervention procedures were also performed on multiparas in close ratios to primiparas. Humphrey and Tucker (2009) analyzed vaginal birth cases in their study and concluded that the ratio of induction use in birth was 32.3%. Leal et al. (2014) detected that among women giving vaginal birth in laboring stage, 37% were given fundus base and 56% were given episiotomy. In a research conducted in İzmir, Turkey, that integrated 191 pregnant women, it was reported that during laboring, midwives administered enema to 69.1% of women, administered perineural shave to 2.6% of women, administered antibiotic prophylaxis to 24.6% of women, 96.9% of women were prescribed a dietary restriction, 27.7% of women were given hydration, 19.9% of women were given amniotomy, 83.2% of women received continuous EFM, 36.1% of women received antispasmodic, 88% of women had bladder catheterization, 51.3% of women had oxytocin induction, and 88% of women had episiotomy (Balçık, 2014).

Sufficient obstetric care and intervention provided during birth stage can be significantly effective in preventing many of the potential complications in the birth-giving process. Untimely and routine administration of such interventions is likely to cause adverse effects on the functioning of fetal, maternal, birth and hormonal secretion and may even call for complementary interventions (Begley, 2014; Leal et al., 2014; Rossen et al., 2010; Yeygel Özcan & Aluş Tokat, 2015).

Few studies revealed that interventions are common practices during birth process and cause of complications. Accordingly, instead of a birth-service approach based on tradition and routine, by adopting evidence-based procedures and individualized care, women can have a chance to have a positive birth experience (Darra, 2009). Moreover, by detecting the effects of birth-related interventions on the maternal and newborn, this study aims to lead in specifying related policies and forge clinical guidelines. In Turkey, there is a scarcity of studies that aim to determine the ratios of birth intervention and consequential effects. This research was conducted to examine the effects of obstetric interventions in the delivery room on the birth process and newborn health.

Research Questions

In this study, answers were sought to the following questions:

1. What are the obstetric interventions applied during delivery?
2. How frequently are obstetric interventions during labor applied?
3. What are the effects of obstetric interventions on the birth process and newborn's health?

Method

Study Design

This research was conducted as an analytical cross-sectional study.

Sample

Population of the research consisted of puerperant women who had given birth in a state hospital in Aydin city center. Among those having met the criteria for inclusion, the sample included 354 puerperant women selected from population via improbable sampling method. Participants had given birth between December 2016 and June 2017 in the same hospital where, in the previous year, number of women giving vaginal birth was 4419. On the basis of 95% confidence interval ($\alpha=0.05$) and $p=0.50$ equivalence, the number of puerperant women to include in the sampling was computed as 354.

In this study, inclusion criteria for the puerperant women were education in elementary and higher level, age of 18 and above, giving birth in the hospital where the study was executed, speaking and understanding Turkish language, not having a birth plan assigned as cesarean at pregnancy and giving consent to participate in the research. Puerperant women with an inadequate level of mental health to complete the survey form were excluded from the research.

Data Collection

Upon reviewing relevant literature, researchers collected research data (Escuriet Peiró et al., 2014; Gottvall et al., 2011; Karakuş et al., 2014) to design a 36-question survey form. Designed by researchers, this form entailed 8 questions on the socio-demographic features of puerperant women, 14 questions on obstetric and birth-related features and 14 questions related to the data of the newborn.

Question form consisted of questions that start with the admission of women to delivery room and includes laboring and birth process. Data were collected by the two researchers during 1–48 hours in

postpartum stage of puerperant women by conducting face-to-face interviews, document (patient file) analysis techniques, and a survey completion. The data related to socio-demographic and obstetric features, perineum shave performed during birth process, mobility restriction, restricted oral intake, fundus base interventions; in the analysis of newborn data skin touch contacts, and time of first suckling and relevant data were garnered through face-to-face interviews and information shared by puerperant women. Data on other intervention procedures, birth process, and newborns were collected by analyzing physical drug requests and notes in the patient file as well as the treatment info and notes in midwife/nurse monitoring form.

Statistical Analysis

Analysis of the data gathered from the research was performed on SPSS 21.0 software program. In data analysis, descriptive statistics (mean, standard deviation, number, and frequency distributions) and Chi-Square test were utilized. In the study, the accepted level of significance was $p < 0.05$.

Ethical Considerations

To conduct this research, required consent (No: 53043469-050.04-04) was taken from Aydın Adnan Menderes University Faculty of Medicine, Ethics Committee of Noninvasive Clinic Researches, and written consent from General Secretariat of Aydın Provincial State Hospitals Association were obtained. Next, a "Volunteer Information Form" was sent to participant puerperant women to explain research objective, plan, duration, and expectations from participants, how and where obtained data would be used. On the basis of willingness and voluntariness principle, they were asked to give their written consent on the informed consent form of the research.

Results

Of all the participating puerperant women of the research, 28.8% were elementary school graduates, 86.4% were housewives, 87.9% had social security, 61.9% perceived that their income and expenses were equal, and 75.4% lived in a nuclear family structure. In addition, 30.5% of women had husbands who graduated from elementary school. A vast majority of puerperant women were within the age range of 20–34 and mean age was 26.62 ± 5.42 (minimum [min] 18–maximum [max] 42), 48.6% had given 1–2 births, and 92.4% had given birth within

37–41 gestation weeks. It was detected that 95.4% of the newborns in the research had a birth weight between 2.500–4.499 grams.

As cervical dilation values in the admission to delivery room were analyzed, it was reported that 84.5% of puerperant women were admitted to delivery room in 4 cm and lower range of cervical dilation. It was detected that during the first stage of birth, puerperant women were given continuous EFM (80.5%), oxytocin induction (79.9%), mobility restriction (56.8%), amniotomy (49.7%), and enema (44.1%) interventions. In the second stage of birth it was detected that the most common interventions were episiotomy (47.7%) and fundus base (44.4%) (Table 1).

Of the participating puerperant women in the research, 15.3% gave C/S birth. Fetal distress (55.6%) is one of the most evident cesarean indications. It became clear that among 34.5% of puerperant women, duration in between admission to delivery room and second stage of birth was between 5–9 hours and among 10.2% of women this interval was 21 hours and above (Table 2). In addition, the mean duration between admission to delivery room and second stage was 9.37 ± 8.93 hours (min:15 minutes; max: 58 hours). It was witnessed that among 15.3% of puerperant women, perineum abrasion occurred and among 12.4% of women suture was done next to episiotomy. In the third stage of delivery, complications were observed in 2 cases (0.6%) of shoulder dystocia, the separation time of the placenta exceeding 30 minutes (13.6%) and the removal of the placenta by hand (7.6%) (Table 2).

As the birth results of newborns included in the research were analyzed, it became evident that 49.2% of newborns received no skin touch contact after birth, 24% of newborns received intervention in delivery room and 16.9% of newborns were in need of intensive care. It was found that 16.4% of the newborns were not breastfed after birth, 57.6% of those who were breastfed were breastfed within the first 30 minutes and 20.6% between 31–60 minutes. It was reported that the need for an oxygen support (20.4%) and deep tracheal aspiration (20.1%) needs of newborns were remarkably high. The ratio of newborns in need of resuscitation was computed as 4%. Furthermore, it was observed that ecchymosis and clavicle fracture (8.3%) were common in the newborn's arm (16.7%), face (58.3%), and the back (16.7%) (Table 3).

Table 1
Interventions to Puerperant in the Delivery Room (n=354)

Interventions		f	%
Cervical dilation in admission to the delivery room	0–4 cm	299	84.5
	≥5 cm	55	15.5
Interventions at the first stage of birth*	Amniotomy	176	49.7
	Perineum shaving	6	1.7
	Enema	156	44.1
	Oxytocin induction	283	79.9
	Continuous EFM [†]	285	80.5
	Analgesic drug	105	29.6
	Epidural analgesia	4	1.1
	Restriction of free movement	201	56.8
Interventions at the second stage of birth*	Restriction of oral intake	67	18.9
	Episiotomy	169	47.7
	Fundus base	157	44.4
	Mesne katteri	41	11.6
	Vacuum	4	1.1
	Oxygen support	3	0.8

*The intervention percentages applied were calculated over n=354.
Note. [†]EFM: Electro Fetal Monitoring

Table 2
Characteristics of Puerperants Related to Birth Results (n=354)

Features		f	%
Way of birth	Vaginal	300	84.7
	Cesarean	54	15.3
Indications for cesarean section (n=54)	Fetal distress	30	55.6
	Non-progressive labor	17	31.4
	Fetal presentation	7	13.0
Tissue damage in the perineum*	Perineal injury	54	15.3
	Suture other than episiotomy	44	12.4
Time between admission to the delivery room and the second stage of birth*	1–4 hours	116	32.8
	5–9 hours	122	34.5
	10–14 hours	53	15.0
	15–20 hours	27	7.6
	21–58 hours	36	10.2
Complications developing at the third stage of birth*	Shoulder dystocia	2	0.6
	Separation time of the placenta exceeding 30 minutes	48	13.6
	Removal of placenta by hand	27	7.6

* Percentage calculations were made on n=354.

Table 3*Delivery Results of Newborns (n=354)*

Delivery results of newborns		f	%
5th minute APGAR	7–10	294	83.1
	4–6	57	16.1
	3 and below	3	0.8
Postnatal negative findings in newborns*	No skin contact application	174	49.2
	Having difficulty sucking	50	14.1
	Without spontaneous breathing	19	5.4
	Intervention applied	85	24.0
	In need of intensive care	60	16.9
First breastfeeding time	0–30 minutes	204	57.6
	31–60 minutes	73	20.6
	1–3 hours	16	4.5
	4 hours and over	3	0.8
	Not breastfeeding	58	16.4
Interventions to the newborn [†]	Stimulus	21	5.9
	Deep tracheal aspiration	71	20.1
	Oxygen support	74	20.4
	Resuscitation	14	4.0
Trauma in the newborn (n=12)	Ecchymosis on the arm	2	16.7
	Ecchymosis on the facial	7	58.3
	Ecchymosis on the back	2	16.7
	Clavicle fracture	1	8.3

*Percentage calculations were made on n=354. [†]Data can be folded since more than one option can be marked.

In order to analyze the effects of interventions made in the first stage on the results of birth, Chi-Square test was applied and test results demonstrated that among women admitted to delivery room in cervical dilation below 5 cm, second stage duration of birth significantly extended and the likelihood of C/S birth climbed ($p=0.000$, $p<0.01$; $p=0.000$, $p<0.01$, respectively). Among those having received amniotomy ($p=0.000$, $p<0.01$) and oxytocin induction, it was highly probable to see C/S birth ($p=0.046$, $p<0.05$). In women who received continuous EFM, analgesic drug, mobility, and oral intake restriction interventions, it was evidenced that second stage of birth extended climbed ($p=0.000$, $p<0.01$; $p=0.028$, $p<0.05$; $p=0.042$, $p<0.05$; $p=0.048$, $p<0.05$, respectively) (Table 4).

Moreover, in the conducted statistical analysis, it was detected that no relationship existed between epidural analgesia administered in the first stage of

birth and admission to delivery room and the duration in between second stage of birth and mode of birth. Likewise, not any statistical relationship was computed between perineum shave and two results. In the early admission to delivery room, it was reported that among newborns suckling difficulty ($p<0.01$), intensive care need ($p<0.01$), as well as demand for intensive care in continuous EFM procedure escalated ($p<0.05$). It also became evident that analgesic drug intake increased trauma occurrence in the newborn ($p<0.05$), experiencing suckling difficulty ($p<0.01$) and intensive care needs ($p<0.01$) (Table 5). In addition, it was revealed that among the women taking analgesic drug it was a significantly high likelihood to measure 5. min. APGAR score <7 in babies ($p<0.05$).

Moreover, it was not viable to detect a statistical relationship birth between other interventions administered in the first stage and trauma occurrence,

Table 4

The Effects of Interventions at the First Stage of Birth on the Results of Birth

Interventions and implementation		Time between admission to the delivery room and the second stage of birth (hour)					Way of birth			
		1-4	5-9	10-14	15-20	21-58	NVD*		C/S†	
		f	F	f	f	f	p	f	f	p
Cervical dilation in delivery to the delivery room	0-4 cm	29	45	30	18	25	0.000	105	42	0.000
	≥5 cm	87	77	23	9	11		195	12	
Amniotomy	Yes	51	65	27	15	18	0.635	139	39	0.000
	No	65	57	26	12	18		161	15	
Enema	Yes	34	58	26	21	17	0.000	127	29	0.121
	No	82	64	27	6	19		173	25	
Oxytocin induction	Yes	95	97	39	21	31	0.634	200	38	0.046
	No	21	25	14	6	5		100	16	
Continuous EFM‡	Yes	76	110	42	23	34	0.000	236	49	0.039
	No	40	12	11	4	2		64	5	
Analgesic drug	Yes	21	39	18	7	15	0.028	209	45	0.040
	No	95	83	35	20	21		91	9	
Restriction of free movement	Yes	58	69	28	19	27	0.042	164	37	0.059
	No	58	53	25	8	9		136	17	
Restriction of oral intake	Yes	11	20	9	5	11	0.048	34	22	0.000
	No	105	102	44	22	25		266	32	

Note. *NVD: Normal vaginal delivery, †C/S: Cesarean, ‡EFM: Electro fetal monitoring

Table 5

The Effects of Interventions at the First Stage of Birth on Newborn Health

Interventions and implementation		Trauma			Suction difficulties			NICU* needs		
		Yes	No	p	Yes	No	p	Yes	No	p
		n	n		n	n		n	n	
Acceptance to delivery room with <5 cm cervical dilation	Yes	7	140	0.131	33	114	0.000	34	112	0.008
	No	4	203		17	190		26	181	
Continuous EFM‡	Yes	11	274	0.097	44	241	0.149	54	231	0.046
	No	0	69		6	63		6	62	
Analgesic drug	Yes	6	94	0.049	23	77	0.003	29	71	0.000
	No	5	249		27	227		31	222	
Restriction of free movement	Yes	10	191	0.020	40	161	0.000	45	155	0.002
	No	1	152		10	143		16	138	

Note. *NICU: Neonatal intensive care unit, ‡EFM: Electro fetal monitoring

experiencing suckling difficulty, newborn intensive care unit (NICU) needs of the newborn. These interventions were amniotomy, oxytocin induction, enema, perineum shave, epidural analgesia, and oral intake restriction, respectively (Table 5).

In order to analyze the relationship between interventions performed in the first and second stages of birth, each intervention's effect on the other was examined. It became apparent in this study that among women admitted to the delivery room early, compared with

women not admitted early, oxygen support was way higher in the second stage of birth ($p < 0.05$). Among women that received amniotomy, compared with women that received no intervention, ratios of suction ($p < 0.05$) and episiotomy ($p < 0.01$) in the second stage of birth was higher and among those receiving oxytocin induction the ratio of performing suction ($p < 0.05$) at birth escalated (Table 5).

In women receiving continuous EFM, fundus base ratio at birth was measured as 47.4%, women with no intervention had a ratio by 31.9%; hence the difference in between was reported to be statistically significant ($p < 0.05$). Besides, a significant difference of episiotomy ratio was computed between those receiving continuous EFM (52.3%) and non-receiver women (29.0%) ($p < 0.01$). It became evident that analgesic drugs taken in the first stage of birth heightened fundus base ($p < 0.01$) at birth and suction ($p < 0.05$) ratios. Furthermore, among women taking analgesic drug (58.0%) episiotomy interventions were more commonly performed than those not taking drug (43.7%) ($p < 0.05$). Also, in the women who received mobility restriction and oral intake restriction, the ratio of performing fundus base at birth was computed to be at a statistically significant level ($p = 0.019$, $p < 0.05$; $p = 0.004$, $p < 0.01$, respectively) (Table 5).

Discussion

In relation to evidence-based interventions, suggested procedures are late admission to delivery room and avoiding routine usage of enema, perineum shave, oxytocin induction and similar interventions (Berghella et al., 2008). Besides in this study it was reported that in the first stage of birth common interventions were continuous EFM (80.5%), oxytocin induction (79.9%), mobility restriction (56.8%), amniotomy (49.7%), enema (44.1%), analgesic drug (29.6%), epidural analgesia (1.1%), mobility restriction (56.8%), oral intake restriction (18.6%) and perineum shave (1.7%). Similarly, in a thesis study conducted in İzmir among 191 pregnant women, it was stated that during birth process 69.1% of pregnant women were given enema, 2.6% perineum shave, 96.9% dietary restriction, 27.7% hydration, 19.9% amniotomy, 83.2% continuous EFM, 36.1% antispasmodic and 51.3% oxytocin induction (Balçık, 2014). Dahlen et al. (2012) compared the rates of intervention in low-risk primipara deliveries in a state hospital and private hospital in Austria, compared to the state hospital, induction in the private

hospital (31% versus 23%), the use of vacuum and forceps at birth (29% versus 18%), epidural analgesia (53% versus 32%) and episiotomy (28% versus 12%) were reported to be applied at a higher rate. In a study conducted in Canada where 6421 pregnant women were included, it was reported that 62.9% of the pregnant women had continuous EFM, 44.8% had oxytocin induction, 5.4% had enema and 57.3% had epidural anesthesia (Chalmers et al., 2009). Leal et al. (2014), in a descriptive study conducted in Brazil, it was determined that pregnant women had a high rate of interventions in the delivery room. Based on these results, it is seen that intervention practices are widely used in the first stage of labor contrary to evidence-based practice recommendations.

It was detected in this study that in the second stage of birth puerperant women received episiotomy (47.7%), fundus base (44.4%), bladder catheter (11.6%), suction (1.1%) and oxygen support (0.8%) interventions. Leal et al. (2014) determined the rate of fundal compression as 37% and episiotomy as 56% in women who had vaginal delivery. Dahlen et al. (2013) in their research that covered 88.437 pregnant women in Austria demonstrated that during birth process 16% of women received suction /forceps and 32% of women received episiotomy. Likewise, Balçık (2014) and Chalmers et al. (2009) determined that fundus base, forceps, suction and episiotomy are ubiquitously administered to pregnant women. Interventions administered in the second stage of birth are in parallel with relevant literature and signal high ratios of interventions.

In "birth management" guidelines developed by Creedon et al. (2013) to specify terms of admission to delivery room it was stated that to be admitted to delivery room it is required to observe 3 cm and above cervical dilation. In the recent "Intrapartum care for a positive childbirth experience" guideline issued by World Health Organization, it is emphasized that cervical dilation must be 5 cm and above in the admission to delivery room (World Health Organization, 2018). It was identified that a vast majority of puerperant women analyzed in this research were admitted to the delivery room while cervical dilation was below 5 cm (early admission).

It became apparent in this study that among those admitted to the delivery room early, first stage of birth extended longer, and the ratio of C/S birth was higher in a statistically significant way. It was also

witnessed that among those admitted to the delivery room early, ratios of episiotomy and removal of placenta by hand were higher. An analysis of the effects of early admission on the newborn manifested that among babies admitted early, there was a high level of suckling difficulty and intensive care need. In literature there are a number of studies that analyze the size of different cervical dilations. Anant et al. (2013) in their India-based study among 5167 low-risk pregnant women compared birth results between <4 cm and >4 cm of cervical dilation in the admission to delivery room. In this randomized controlled study (RCS) it was detected that among pregnant women admitted to delivery room in <4 cm of cervical dilation, the ratio of amniotomy, oxytocin need, C/S birth and operative birth ratios were much higher. Similarly, Kauffman et al. (2016) in their study showed that in the delivery room admission of pregnant women having cervical dilation lower than 4 cm, the frequency of medical intervention and C/S ratio climbed. In a cross-sectional study conducted in Tanzania among 500 pregnant women it was witnessed that women admitted to delivery room with cervical dilation below 3 cm; oxytocin procedure, early membrane rupture and C/S ratios were above the ratios of women admitted to the room when their dilation was 3 cm (Chuma et al., 2014). In Cochrane systematic compilation in which Sng et al. (2014) examined nine studies on 15.752 pregnant women, it was reported that C/S birth and epidural anesthesia ratios were higher among women admitted to the delivery room when cervical dilation was below 4–5 cm. Based on these results it can be argued that admission to delivery room with cervical dilation below 5 cm caused not only a great number of maternal negative effects but also increased the frequency of performing other interventions.

Early admission to delivery room inevitably results in spending a great length of first stage of birth at hospital; thus, it is suggested that the ratio of interventions escalates. The results of our study play a vital role by virtue of demonstrating early admission's effects on the newborn and exhibiting the type of data that comply with the latest recommendation of World Health Organization.

Amniotomy is the procedure of opening amniotic membranes artificially (Başgöl & Beji, 2015). Routine amniotomy procedure is not a recommended move in the management of birth process (Berghella et al., 2008; World Health Organization, 2018). It was de-

tected that about half of the women included in the study received amniotomy and among those receiving amniotomy C/S birth ratios were higher. It was also reported that suction procedure and episiotomy were in higher ratios among those receiving amniotomy and triggered no difference in newborn results. In the same vein, in a prospective RCS among 220 pregnant women, those who received amniotomy procedure by a ratio of 50% and amniotomy; the frequency of birth by C/S birth and hospitalization duration was significantly higher than those receiving no amniotomy and no difference was measured in early newborn results (Baylas Şahin and Yapar Eyi, 2017). Similarly, in Cochrane systematic compilation among 5021 pregnant women C/S risk was reported to be higher in amniotomy group (Wei et al., 2013). As opposed to our research findings Ray and Ray (2014) in their study claimed that amniotomy affected newborn findings and elevated infection, monitoring, and hypotension risk of newborns. This discrepancy is likely to stem from analyzing only short-term health condition of the newborn.

It became clear that most of the puerperant women in our study received oxytocin induction in the first stage of birth. It was reported that C/S births were higher and newborn findings were identical in pregnant women receiving oxytocin. Similarly, in a meta-analysis study that examined nine researches, it was seen that oxytocin induction bolstered C/S ratio (Saccone et al., 2017). Likewise, Mozurkewich et al. (2009) in their systematic compilations that included 34 studies on pregnancies with intrauterine developmental delay reported that oxytocin induction gave impetus to C/S births. Kenyon et al. (2013) also designated in their study that in terms of effects on the newborn, oxytocin procedure triggered no difference in APGAR results, umbilical cord pH, hospitalization in neonatal intensive care unit and neonatal mortality. An analysis of literature evidence that oxytocin induction pressure during birth process led to not a positive difference on the newborn, but rather stood out as a significant factor negatively affecting birth process and heightening the ratio of C/S births.

In the first stage of birth, it is suggested to monitor low-risk pregnancy via fetal monitorization once in every 30 minutes, during second stage it is suggested to monitor once in every 15 minutes (Miller & Miller, 2012). In its intrapartum care guidelines, WHO suggests not to follow continuous EFM procedure (World Health Organization, 2018). Yet it was

detected that continuous EFM was administered to more than half of the participant women in our research. It was determined that continuous EFM procedure increased birth duration and C/S birth ratios and this finding is in line with relevant literature. In other studies, it was seen that continuous EFM significantly escalated C/S birth ratios (Alfirevic et al., 2013; Rossignol et al., 2013). Ananth et al. (2013) in their 14-year retrospective studies to examine 55 million pregnant women attested that frequency of continuous EFM procedure rose gradually and elevated C/S and interventional birth and fetal distress ratios. As the effects of continuous EFM on the newborn are analyzed in our study, it was detected that newborn's 5. min. APGAR score was relatively lower and intensive care needs heightened. Alfirevic et al. (2017) in their Cochrane systematic compilations among more than 37.000 pregnant women drew a comparison between continuous and discontinuous EFM results and proved that in relevant indicators of cerebral palsy, mortality, and neonatal health no difference was measured between two groups. Similarly, in the guideline formed by Creedon et al. (2013) to compare continuous EFM and discontinuous EFM procedure it was reported that continuous EFM procedure created not a significant difference in terms of APGAR results and admission to intensive care unit. In line with the findings of this research it is safe to argue that continuous EFM provides not any protective effect on newborn results but rather leading to a negative effect on newborn health. This finding can be attributed to the role of continuous EFM to elevate C/S and interventional vaginal birth ratios.

It was also unveiled in this study that among women monitored via continuous EFM, fundus base and episiotomy ratios were significantly high at birth. These findings can be viewed as negative outcomes of continuous EFM such as mobility restriction and consequential adverse results due to mobility restriction.

At birth, perineum and pubis shave procedure are the kind of procedures not recommended by WHO (World Health Organization, 2018). It was detected in this research that perineum shave was administered, and this procedure caused not any statistically significant effect on birth process, newborn findings, and other interventions. Yet in the Cochrane database that integrated three RCSs among 1039 women divided as the group receiving routine perineum shave prior to birth and non-receiver group, not any difference was observed with respect to puerperal

infection and moreover within the shaved women, a number of side effects such as itching, rash and burning sensation emerged (Basevi & Lavender, 2014). These findings put forth that perineum shave did not provide any clinical advantage but rather triggered maternal negative effects in postpartum stage.

It is suggested that during birth process pregnant women should take the most comfortable position and by letting them move, upright positions should be supported (World Health Organization, 2018). It was revealed in this research that more than half of participant puerperant women had restricted mobility in the first stage of birth and were monitored while in bedbound horizontal position. It is argued that this procedure increased birth duration and the need for fundus base. Likewise, in Cochrane systematic compilation that analyzed 25 studies on 52108 women, it was reported that in the first stage of laboring, standing in an upright position helped to reduce birth duration of women compared with horizontal positions (Lawrence et al., 2013). Unlike this study, our research findings proved that monitoring in horizontal position affected newborn health negatively. Babies of women whose mobility were restricted manifested <7 APGAR scores in the 5th minute and higher incidences of trauma, intensive care needs and suckling difficulty experience. It is suggested that high level of mobility restriction application in this research is due to the widespread use of continuous EFM procedure.

American Obstetricians and Gynecologists Association (2009) stated that pregnant women with no complication can consume grainless oral liquids. It is suggested that in the intrapartum care of low-risk pregnancy, oral intake should not be restricted (World Health Organization, 2018). Yet in this research it was detected that 18.9% of puerperant women admitted to delivery room were forced to restrict their oral intake. It was attested that in restricted oral intake, first stage of birth increased, and C/S birth ratio climbed. As its effects on the newborn are analyzed it is evidenced that in women whose oral intake was restricted, babies had <7 APGAR scores in the 5th minute, trauma, suckling difficulty, and greater need for intensive care unit. Furthermore, restricted oral diet was found to trigger multiple fundus base interventions. In Cochrane compilations conducted by Singata et al. (2013) to assess harms and benefits of solid and liquid oral intake restriction throughout

birth process, it was concluded that among low-risk pregnancy cases in which only water, only carbohydrate drinks and both fluid and solid food were consumed there was not significant differences in terms of C/S ratios, interventional vaginal birth and <7 APGAR scores in the 5th minute. Based on these findings it is safe to argue that oral intake restriction in pregnancy had no preventive effect in risk aversion; on the contrary it rendered negative effects on birth process and newborn findings. The reason why oral intake restriction gave rise to fundus base procedure can be explained with the fact that since pregnant women have no sufficient energy, they fail to control birth process.

Although evidence-based procedures avoid recommending enema use, it is clear the in this research enema was given to a great number of pregnant women. Among those receiving enema, duration in the first stage of birth was observed to last longer. In contrast with this finding in a Cochrane systematic compilation in 1917 pregnant women it was stated that enema procedure had no effect on birth duration (Revez et al., 2013). Relationship between enema and birth duration is suggested to be linked with lower urinary frequency after enema and longer stay in bed which may have resulted in longer birth duration.

In this study most of the pregnant women were given analgesic drug and it was detected that birth duration was longer in those women. It was also attested that analgesic drug intake negatively affected all the parameters that assessed newborn and as seen, 5th min. APGAR scores of these newborns were lower, trauma ratios were higher, suckling performance was poor and need for intensive care was higher. Newborns' results can be due to the transmission of analgesic drug into intrauterine and also extension of birth duration.

In non-risky pregnancies, it is suggested to administer epidural analgesia if pregnant women want (World Health Organization, 2018). In this research, as seen, administering epidural analgesia is in a low ratio. It was determined that epidural analgesia had no effect on birth process but increased suction and episiotomy interventions in the second stage of birth. As for its effects on the newborn it was evidenced that 5th min. APGAR score was <7 and need for intensive care rose. As opposed to our findings, in a different study that compared birth results of 350

women receiving epidural analgesia and 1400 pregnant women not receiving epidural analgesia it was reported that suction and C/S ratios were higher in the group receiving no epidural and first and second stages of birth were longer in epidural administered group (Hasegawa et al., 2013). In relevant literature there is a limited number of studies on the effects of epidural analgesia; hence there is need for updated research. It is a significant finding of our study in terms of revealing negative effects of epidural analgesia, particularly on the newborn health.

The World Health Organization (2015), and Turkish Obstetricians and Gynecologists Association (2011) are in coordination with the Ministry of Health to work on lowering C/S ratios. In literature, there are a number of latest advanced studies aimed at detecting the causes of C/S. As demonstrated in these studies, among the causes of C/S are socio-demographic factors, obstetric medical causes, non-obstetric medical causes, giving birth in a private hospital, lack of knowledge, physician recommendation, and choice of pregnant woman (Azami-Aghdash et al., 2014; Caughey et al., 2014; İggüder et al., 2017; Özkan et al., 2013). It was observed in our study that admission to delivery room occurred when cervical dilation was below 5 cm, amniotomy, analgesic drug intake, continuous EFM, and restriction of oral intake boosted C/S ratios. Participant women in the study were at first admitted to delivery room on the basis of normal vaginal birth, but in the course of time they had to give C/S birth. This is a significant outcome as it shows that in addition to various cases that heighten C/S risk as seen in literature, the process and applied interventions in the process also play a role in the elevated C/S risk. It can be argued that lowering the ratio of interventions in delivery room could also be effective in decreasing C/S ratios too.

As the relationship between interventions made in the first and second stages of birth were examined, it was underscored that amniotomy procedure heightened suction and episiotomy procedure ratios, oxytocin induction elevated fundus base ratio, continuous EFM climbed fundus base and episiotomy ratios, analgesic drugs administered in the first stage of birth escalated fundus base, suction and episiotomy ratios, epidural anesthesia elevated suction and episiotomy procedure ratios and restriction in mobility and oral intake augmented fundus base administered at birth. These findings hold value as they represent the very first study exhibiting the

relationship between interventions made in various stages of birth.

Study Limitations

One of the limitations of this study is collecting the intervention data from patient file. Since there may also be unrecorded intervention procedures, there is a likelihood that findings are inadequate.

Conclusion and Recommendations

In this study conducted to analyze interventions made in delivery room on the birth process and newborn health, it was observed that in the first stage of birth continuous EFM, induction, mobility restriction, amniotomy and enema interventions were commonly applied, a significant portion of pregnant women were admitted to delivery room early (<5 cm cervical dilation), most of the women whose birth was set as vaginal birth had to give C/S birth, most significant C/S indications were fetal distress, a great number of women experienced perineum abrasion at birth and suture was done next to episiotomy, placenta split-up duration longer than 30 minutes, removal of placenta by hand were reported complications. Common effects on the newborn were shoulder dystocia, intervention in delivery room and higher intensive care need of the newborn, trauma and clavicle fracture in arm, face, and back parts of the body. It was concluded that interventions made in the first stage of birth negatively affected birth process and newborn health, while interventions in the first stage also led to an increased need for intervention in the second stage. These results hold value, since they are the first study conducted in Turkey to examine the effects of interventions made in the delivery room and their frequency on the birth process and newborn health.

Based on these results, it is suggested that healthcare professionals employed in birth services reduce interventions they frequently use in delivery rooms and opt for care services that involve an evidence-based procedure. In the formal and in-service trainings provided to healthcare professionals, an evidence-based care at birth process should be promoted and hospital managements should detect the causes of high ratio of intervention at birth and develop solution-based methods to solve the relevant problem. By forming a clinical guideline on this topic, results should be evaluated, and further RCSs should be conducted to analyze the effects of intervention procedures performed at birth.

Ethics Committee Approval: This study was approved by Ethics committee of Aydın Adnan Menderes University, (Approval No: 53043469-050.04-04).

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

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