Abstract

Purpose: Preeclampsia affects 3% to 8% of all pregnancies. There are two distinct subtypes; early- (<34 weeks) and late-onset (≥34 weeks). Each subtype is associated with increased risk of cardiovascular disease. Lactation has been shown to improve cardiovascular outcomes. The purpose of this study was to describe lactation practices among women with each subtype of preeclampsia and determine the association between lactation and blood pressure at the initial postpartum visit.

Study Design and Methods: This retrospective cohort study included 246 subjects; 120 early- and 126 with late-onset preeclampsia who gave birth to live singleton newborns at a large suburban tertiary referral center in south central Pennsylvania between January 2012 and June 2016. Electronic health records were reviewed and data abstracted. Univariate and bivariate analyses were conducted.

Results: There was a significant difference in breastfeeding intent ($p = .004$) as well as rate of breastfeeding at maternal hospital discharge ($p < .001$) by preeclampsia subtype. However, there was no difference in rate of breastfeeding at the initial postpartum visit ($p = .21$) between subtypes. There was a significant difference in systolic ($p = .03$) and diastolic ($p = .04$) blood pressure between those breastfeeding and those who were not breastfeeding at the initial postpartum visit.

Clinical Implications: Healthcare providers should provide women with preeclampsia clear and consistent messaging about importance of breastfeeding during pregnancy and the postpartum period on its association with improved neonatal outcomes, and specifically education on the cardioprotective benefit of sustained lactogenesis.

Keywords: Blood pressure; Lactation; Postpartum period; Preeclampsia.

Association Between Lactation and Postpartum Blood Pressure in Women with Preeclampsia

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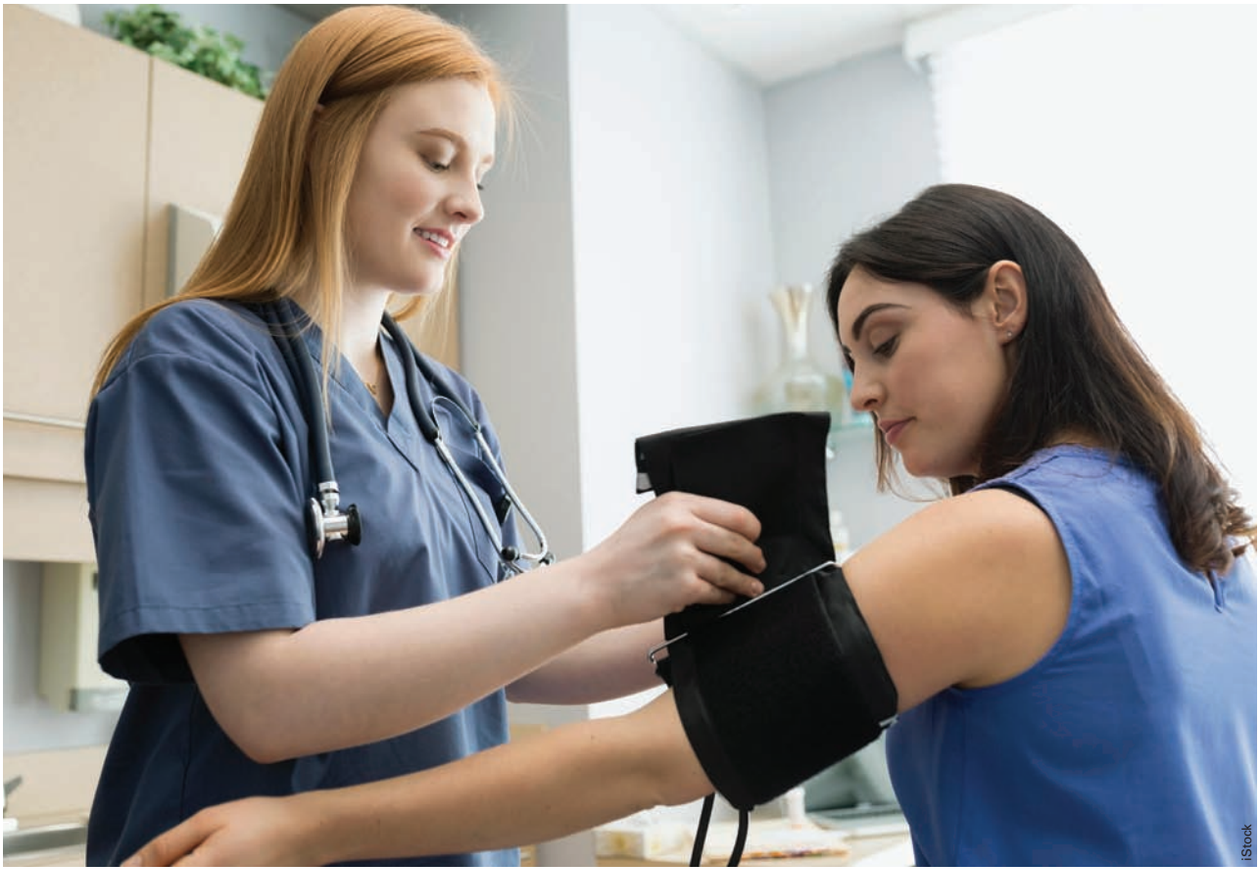
Preeclampsia is a hypertensive disorder of pregnancy that affects 3% to 8% of all pregnancies (Hutcheon, Lisonkova, & Joseph, 2011) and is characterized by the new onset of hypertension (≥140 mmHg systolic or ≥90 mmHg diastolic) and proteinurea after 20 weeks gestation (American College of Obstetricians and Gynecologists [ACOG], 2013). In the absence of proteinurea, the diagnosis may be made if the woman experiences any one of the following signs or symptoms in addition to hypertension; pulmonary edema, new onset of cerebral or visual disturbances, decreasing platelet count (<100,000 microliter), and a serum elevation in creatinine or liver transaminases (ACOG).

The pathophysiology of preeclampsia remains unclear and seems to result from a complex interplay of maternal and fetal factors (Hermes et al., 2013). The disease is heterogeneous in nature, and there are two distinct preeclampsia subtypes, early- and late-onset (Myatt et al., 2014). These subtypes are defined relative to the timing of onset during pregnancy. The early-onset subtype is diagnosed at <34 weeks gestation, is often more severe in its presentation, and is associated with worse maternal and neonatal outcomes (Boyd, Tahir, Wohlfahrt, & Melbye, 2013; Lisonkova & Joseph, 2013; van Rijn et al., 2013). The late-onset subtype is diagnosed later in pregnancy (≥34 weeks gestation) and has been shown to have a higher incidence than the early-onset subtype (Lisonkova & Joseph). Both subtypes are associated with increased risk of cardiovascular disease (CVD). Women



with the early-onset preeclampsia subtype have approximately seven to nine times the increased risk, whereas those women affected by the late-onset subtype have approximately twice the risk of CVD later in life than those women who were normotensive during pregnancy (Mongraw-Chaffin, Cirillo, & Cohn, 2010; van Rijn et al.).

Women with early onset preeclampsia have seven to nine times the risk of cardiovascular disease later in life than those women who had a normotensive pregnancy.

Bushnell et al. (2014) reported that approximately 18% of women with a history of preeclampsia versus 1.7% of those with a normotensive pregnancy experienced a cardiovascular event in the 10 years after birth. Preeclampsia may provide an early opportunity to identify women at risk for CVD (Smith, Pudwell, & Roddy, 2013). Up to 80% of CVD is preventable; early identification and management of cardiovascular risk factors may reduce morbidity and mortality among these high-risk women (Smith et al., 2009). Although obstetric providers have become increasingly aware of the association between preeclampsia and CVD, less than 40% counsel these women on cardiovascular risk-reduction strategies (Young, Hacker, & Rana, 2012). Women remain undereducated about the association between preeclampsia and increased cardiovascular-associated morbidity and mortality (Young et al.). Healthcare providers should use every opportunity to educate women with preeclampsia about future CVD risk and encourage adoption of preventative strategies.

There is a well-established association between improved long-term cardiovascular and metabolic profiles in women who have lactated (Natland Nilsen, Midthjell, Andersen, & Forsmo, 2012; Schwarz et al., 2010). There are several pathophysiologic pathways by which lactation improves cardiovascular outcomes, and increased duration of lifetime lactation seems to be correlated with a greater reduction in cardiovascular risk (Nguyen, Jin, & Ding, 2017; Schwarz et al., 2009). Lactation increases metabolic expenditure by approximately 500 kilocalories a day and may help women more quickly return to their prepregnancy metabolic state, as well as aid in postpartum weight loss, reducing cardiovascular risk related to overweight and obesity (Butte, Wong, & Hopkinson, 2001; McClure, Catov, Ness, & Schwarz, 2012). Natland et al. reported that lactation was associated with lower serum cholesterol and triglyceride levels as well as decreased risk of hypertension in women younger than 50 years of age.

The physiologic basis for the association between lactation and blood pressure (BP) seems to be due to repeated exposure to the hormone oxytocin that occurs during periods of lactation (Lee, Kim, Jee, & Yang, 2005). Although short-acting, repeated periods of lactation provides chronic exposure to the hormone oxytocin, which lowers cortisol, increases the action of alpha-2 adrener-

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Lactation has been shown to improve maternal cardiovascular outcomes, possibly through the influence of the hormone oxytocin.

gic receptors, and increases serum levels of estrogen and progesterone (Lee et al.). These combined factors may contribute to the lower BP noted in women who have lactated (Perrine, Nelson, Corbelli, & Scanlon, 2016).

The association between lactation and improved cardiovascular outcomes later in life is well established; however, there is little research on the association between lactation and BP in the postpartum period, particularly in women who have experienced preeclampsia. Approximately one in five women with a hypertensive disorder of pregnancy remains hypertensive (Bramham, Nelson-Piercy, Brown, & Chappell, 2013). Women who remained hypertensive at 6 weeks postpartum had a threefold increased risk of chronic hypertension (Visser et al., 2013). It is important to investigate if lactation is associated with any reduction in postpartum BP in women diagnosed with preeclampsia during pregnancy (Countouris et al., 2016, p. 1.e1). The purpose of this study was to describe the lactation practices of women with each preeclampsia subtype, as well as investigate the association between breastfeeding and BP at their initial postpartum visit. It is hypothesized that women with preeclampsia who breastfeed will have lower postpartum BP than those who do not.

Study Design and Methods

Setting and Participants: This study was conducted at a large suburban tertiary referral center located in south central Pennsylvania. The hospital serves as a referral center for women with high-risk pregnancies due its maternal–fetal medicine specialists and a level three neonatal intensive care unit (NICU). Women with singleton pregnancies and a confirmed preeclampsia diagnosis between January 2012 and June 2016 were included. Subjects were identified from a larger case control study that examined the association between maternal ABO blood type and preeclampsia subtype. They were initially identified using ICD 9 codes for preeclampsia. Medical record review was completed to confirm diagnosis of preeclampsia based on ACOG (2013) diagnostic criteria for preeclampsia. Only women diagnosed with preeclampsia during pregnancy were included. Onset timing of preeclampsia was noted as the gestational age at the earliest documentation of preeclampsia diagnostic criteria. When preeclampsia diagnostic criteria were documented prior to 34 weeks gestation, the subject was classified as having early-onset preeclampsia. When preeclampsia diagnostic criteria were documented ≥34 weeks gestation, the subject was classified as having late-onset preeclampsia. Any cases in which there was a fetal or neonatal death were excluded from the sample (n = 6). All data were collected via review of the electronic health record (EHR) of both the subject and their newborn. Two study personnel abstracted all data using a standardized data collection protocol to ensure that data points were collected from the same location within the EHR.

Measures. Breastfeeding intent was collected based on documentation in the obstetric admission assessment. Women were documented as either wanting to: exclusively breastfeed, both breast and formula feed, as undecided, or formula feed only. When documenting breastfeeding status at maternal hospital discharge, women feeding their newborn their own breast milk via any modality were designated as breastfeeding. Postpartum visits were scheduled by obstetricians in accordance with protocol and occurred between 4 and 6 weeks postpartum. To determine breastfeeding status at the postpartum follow-up visit, documentation of infant feeding method on the postpartum visit summary was reviewed; if not documented, the newborn clinic visit summary that occurred during the same time period was reviewed for infant feeding method. Data on use of antihypertensive medication were retrieved from the medication list noted on each woman's hospital discharge summary. Blood pressure measurements were retrieved from documentation on the postpartum visit summary. Blood pressure at the postpartum visit is standardly tak-

en by trained medical personnel employed by obstetric offices within the health system. The study was reviewed and approved by the Institutional Review Board at the study site.

Sample size. Due to the retrospective nature of study, the sample size was fixed. The principal investigator worked backward to determine the study's effect size. Using the main aim of the study, G power© was used to calculate the sample size. A sample size of 51 per group was necessary (breastfeeding versus not breastfeeding) to detect a medium effect (.05) with a power of 80% at a significance level of 5%.

Data Analysis

Statistical analysis was performed using SPSS version 23. Descriptive statistics were used to summarize sample characteristics. Chi square (x^2) was reported for categorical variables, and independent samples *t*-test was reported for continuous variables in order to assess differences between groups. Statistical significance was set at $p \leq .05$.

Results

Demographics. Two hundred and forty-six women with preeclampsia were included in the study. Of those, 120 had early-onset preeclampsia and 126 had the late-onset preeclampsia subtype. The demographic data of study participants by preeclampsia subtype are presented in Table 1.

Breastfeeding intent by preeclampsia subtype. There was a significant difference in breastfeeding intent (p = .004) by preeclampsia subtype (Table 1). Although a similar percentage of women in both the early- (74.8%) and late-onset (74.6%) preeclampsia subtypes had documented intent to exclusively breastfeed, a higher percentage of women with the early-onset preeclampsia subtype were admitted for labor and birth with intent to use formula only to feed their newborn (20.7%) versus 12.3% of women with the late-onset subtype. More women with the late-onset subtype were undecided about intent to breastfeed on admission (11.9%) than those women with the early-onset preeclampsia subtype (0.9%).

TABLE 1. Sample Characteristics

Characteristics	Preeclampsia (*n* = 246) M(SD)	Early Preeclampsia (*n* = 120) M(SD)	Late Preeclampsia (n= 126) M(SD)	*p*
Prepregnancy BMI	30.4(8.3)	31.71(7.85)	29.1(8.45)	0.02
Gestational age at birth	35(3.6)	32.21(2.7)	37.8(1.9)	<.001
Maternal age	27.6(6.1)	28.22(6.07)	27.16(6)	0.16
	***n*(%)**	***n*(%)**	***n*(%)**	
Race				**0.03**
White	188(76.4)	88(73.3)	100(79.4)	
Black	21(8.5)	16(13.3)	5(4)	
Other	37(15)	16(13.3)	21(16.7)	
Smoking	58(23.6)	33(27.5)	25(19.8)	0.21
Diabetes	16(6.5)	12(10)	4(3.2)	0.06
Gestational diabetes	37(15)	24(20)	13(10.3)	0.05
Chronic hypertension	51(20.7)	32(26.7)	19(15)	0.04
Feeding intent on admission				**0.004**
Formula only	37	23(20.7)	14(12.3)	
Exclusive breastfeeding	166	83(74.8)	83(74.6)	
Undecided	14	1(.9)	13(11.4)	
Both	6	4(3.6)	2(1.8)	
Magnesium sulfate use	235(95)	120(100)	115(91.3)	0.003
Mode of birth				**<.001**
Cesarean birth	153(62.2)	91(75.8)	62(49.2)	
Vaginal birth	93(37.8)	29(24.2)	64(50.8)	
NICU admission	137(56.6)	114(95)	23(18.)	<.001
Breastfeeding at discharge	210(85.7)	112(94.1)	98(77.8)	0.001
BP medication at discharge	132(53.7)	79(65.8)	53(42.1)	<.001
Breastfeeding at postpartum visit	99(49.5)	49(55.1)	50(45)	0.21
BP medication at postpartum visit	54(34.6)	26(42.6)	28(29.5)	0.13

Note. BMI = Body Mass Index; BP = blood pressure; NICU = Neonatal Intensive Care Unit; SD = standard deviation.

TABLE 2:
Breastfeeding and Systolic and Diastolic Blood Pressure by Preeclampsia Subtype

Variable	Lactating at PP Visit	Not Lactating at PP Visit	
All preeclampsia	*n* = 78	*n* = 69	*p*
Mean postpartum systolic BP, SD	120.8(11.8)	126.1(16.6)	0.03
Mean postpartum diastolic BP, SD	77.8(9.5)	81.4(11)	0.04
Early-onset preeclampsia	*n* = 32	*n* = 22	
Mean postpartum systolic BP, SD	120(12.6)	131.4(14)	0.003
Mean postpartum diastolic BP, SD	78(8)	85.5(11.8)	0.01
Late-onset preeclampsia	*n* = 46	*n* = 47	
Mean postpartum systolic BP, SD	121.4(11.4)	123. 6(17.3)	0.47
Mean postpartum diastolic BP, SD	77.7(10.4)	79.5(10.1)	0.41

Note. PP = postpartum; BP = blood pressure; SD = standard deviation.

Breastfeeding at discharge. Although less women with the early-onset subtype intended to breastfeed on admission for labor and birth, at maternal discharge from the hospital there was a significant difference in rates of breastfeeding by preeclampsia subtype (p = .001). More women with early-onset preeclampsia (94.1%) were breastfeeding at maternal discharge from the hospital versus 77.8% of those with the late-onset subtype (p = .001). Women with early-onset preeclampsia experienced more barriers to breastfeeding than those with the late-onset subtype; more infants of mothers with the early-onset subtype were admitted to the NICU (p < .001), were exposed to magnesium sulfate (p = .003), were preterm (p < .001), and born via cesarean (p < .001).

Of all women in the study, NICU admission (p < .001) and breastfeeding intent at admission (p < .001) were significantly associated with breastfeeding at discharge. Women with infants born at an earlier gestational age (M 34.8 weeks, SD 3.76) were significantly more likely (p = .003) to be breastfeeding at discharge.

Antihypertensive medications. At discharge from the hospital, over half of women in the study (53.7%) were prescribed antihypertensive medications. Specifically, 66% of those with the early-onset preeclampsia subtype and 42% of those with the late-onset subtype were prescribed antihypertensive medications at discharge. Of those women requiring antihypertensive medications, 116 (87.7%) were breastfeeding. The number and type of medications prescribed for each patient varied. At discharge, women were prescribed between one and three different types of antihypertensive medication and over 14% of women prescribed antihypertensive therapy were prescribed more than one medication. The two most common medications used to control BP postpartum were nifedipine and labetalol. At postpartum follow-up visit, 34.6% of preeclamptic women continued to require antihypertensive medication; however, there was no difference in breastfeeding practices between those on antihypertensive medication and those who were not (p = .43). Most of those who continued to require antihypertensive therapy had the early-onset preeclampsia subtype (42.6%) versus 29.5% of the late-onset subtype.

Blood pressure at postpartum follow-up visit. At the postpartum follow-up visit, there was a significant difference in both mean systolic (p = .03) and diastolic BP (p = .04) between those women who experienced preeclampsia who were lactating and those who were not (Table 2). However, when women with chronic hypertension were excluded from the sample, there was no longer a significant difference in mean systolic (p = .07) or diastolic BP (p = .09) between those women who were lactating and those who were not at their postpartum visit.

Sensitivity analysis was performed to assess the association between breastfeeding and BP in both preeclampsia subtypes. In the early-onset group, there was a significant difference in both systolic (p = .003) and diastolic BP (p = .001) between those who were lactating at their postpartum visit and those who were not. In the late-onset group, there was no significant difference noted between systolic (p = .47) and diastolic (p = .41) BP between those who were lactating and those who were not at their postpartum visit.

Discussion

Although more women with late-onset preeclampsia intended to breastfeed at admission for labor and birth, more women with early-onset preeclampsia were providing their newborns with human milk at discharge. With an understanding that women with preeclampsia are at increased risk for future CVD, and that breastfeeding has the potential to improve the cardiovascular profile, women should be educated prenatally and immediately postpartum on this association to best promote breastfeeding (Nguyen et al., 2017). In our study, 51 women presented for labor and birth either without the intent to provide their infant with human milk or undecided. Although 26 of these new mothers went on to provide their infants with human

milk prior to discharge, there may be missed antenatal opportunities to educate women on the benefits of human milk feeding for both mother and newborn (Cordero, Oza-Frank, Moore-Clingenpeel, Landon, & Nankervis, 2016).

Cordero, Valentine, Samuels, Giannone, and Nankervis (2012) reported that in women with preeclampsia with severe features, intent remains the strongest predictor of breastfeeding initiation. We also found maternal antenatal intent to provide their infant with human milk to be a significant factor in breastfeeding success; however, we found admission to the NICU to be significantly associated with maternal provision of human milk at discharge. It seems as though the health and wellness of the newborn, as well as the persistent, persuasive, and consistent message about the neonatal benefits of breastfeeding provided by our institution's NICU healthcare providers, may have been convincing to encourage the initiation of lactation in this population. Our findings are in contrast to an older study by Leeners, Rath, Kuse, and Neumaier-Wagner (2005) which reported that having a baby born at <32 weeks gestation and a birthweight <1,500 g was associated with women with hypertensive disorders of pregnancy choosing not to breastfeed. Differences in rates of breastfeeding noted between our study and that of Leeners et al. may be related to the significant focus NICU providers have since begun to place on the importance of breastfeeding due to the plethora of evidence to support the benefits of human milk particularly among premature infants. It may be important to consider the importance of a strong, consistent, and deliberate message by both antenatal and postnatal healthcare providers on the importance of human milk feeding, especially due to the potential impact lactation may have on maternal cardiovascular outcomes in this high-risk population.

At the postpartum follow up visit, there was a significant difference in mean systolic and diastolic blood pressure between women with preeclampsia who were lactating and those who were not.

The American Academy of Pediatrics (2013) states that mothers may be incorrectly advised to discontinue or not initiate breastfeeding specifically related to the use of a medication that their healthcare provider may inadvertently believe may harm their newborn. Anderson (2018) reported that information on the use of antihypertensive medication during lactation is variable. There seem to be limited clinical studies on the concentration of antihypertensive medications in breast milk, and most reports of antihypertensive effect on breast milk are case studies and involve a limited number of subjects (Anderson). In the few studies available, concentration of antihypertensive medications in breast milk has varied based on the timing during which the medication concentration was measured during the feeding, making it even more difficult to determine efficacy and safety of each medication (Beardmore, Morris, & Gallery, 2002).

In our study, 53.7% of women were prescribed antihypertensive therapy at discharge, of those women, 88% were breastfeeding. Women in our study were prescribed from one to three medications, with nifedipine and labetalol being the most common. The U.S. medication label for nifedipine notes that it is excreted in breast milk and should not be taken by breastfeeding mothers (Colaceci et al., 2015); however, Hale classifies the drug as minimal risk (L2) and states that the medication has not been associated with any poor infant outcomes (Colaceci et al.).

Labetalol, a beta-blocker, was also commonly prescribed for our study participants. Beta-blockers' protein binding capacity in maternal plasma varies greatly from drug to drug that in turn may increase risk of adverse reaction; however, overall beta-blockers are considered to be acceptable for use when breastfeeding (Anderson, 2018). Atenolol, which was prescribed for one participant, is associated with well-documented cases of adverse infant outcomes such as bradycardia and hypotension and should be used with caution (Anderson). Use of antihypertensive medication did not seem to impact rates of breastfeeding, there was significant variation in the types of antihypertensive therapies prescribed to these women. When choosing appropriate antihypertensive therapy, providers should take into consideration the clients' breastfeeding status, as well as, factors such as the infants' gestational age and weight. Providers should reference LactMed® when determining appropriate antihypertensive therapy in breastfeeding women and discuss cases of increasing complexity with an International Board Certified Lactation Consultant to determine factors that may result in increased plasma concentrations of the medication in an infant who is consuming human milk.

Although there is a large amount of evidence to support the association between lactation and improved cardiovascular outcomes (Natland et al., 2012; Nguyen et al., 2017; Schwarz et al., 2009, 2010), there is limited research on the association between lactation and postpartum BP in women with preeclampsia. Countouris et al. (2016) reported that lactation had a significant effect on 6-month postpartum systolic (p = .02) and diastolic (p = .02) BP in women diagnosed with gestational hypertension but not in those with preeclampsia. Ebina and Kashiwakura (2012) reported that normotensive women who breastfed had lower systolic BP at 1 month postpartum than those who did not. More research is needed to assess this effect on women with gestational hypertensive disorders in the immediate postpartum period. In our sample, breastfeeding women had significantly lower systolic and diastolic 6-week postpartum BP than those who were not breastfeeding at 6 weeks, particularly those with the early-onset preeclampsia subtype. When excluding women with chronic hypertension,

Clinical Implications

When caring for women with preeclampsia nurses should:

- Educate women with preeclampsia about their increased cardiovascular risk.
- Provide education on the maternal benefits of breastfeeding, particularly in relation to cardiovascular health as it may improve rates of breastfeeding intention.
- In cases when infants cannot be put to breast within the first hour after birth, support the initiation of lactation either through pumping or hand expression.
- At the postpartum visit, continue to provide targeted education and support on lactation to promote increased duration of lactation that may further promote long-term cardiovascular health.

there was no significant difference in BP noted between those who were lactating and those who were not. This finding may further support the importance of the provision of targeted education and support of breastfeeding in women with poor preexisting cardiovascular health.

Countouris et al. (2016) reported that when educated about the cardio-protective effect of breastfeeding, women with preeclampsia had higher breastfeeding initiation and duration rates. As women with preeclampsia may encounter more barriers to breastfeeding, such as maternal–child separation due to an infant in the NICU, a growth-restricted infant, a preterm or late-preterm neonate who may have difficulty feeding or feeling poorly after birth due to the administration of magnesium sulfate or having a cesarean, these women need added lactation support.

Limitations

Data were collected retrospectively at one hospital in a fairly homogenous geographic setting. We were unable to account for "dose" of lactation at both hospital discharge and at the postpartum follow-up visit. More women with the late-onset subtype ($n = 93$) versus those with the early-onset subtype ($n = 54$) were included in postpartum visit data. More women with the early-onset subtype were lost to follow-up, as many patients with this subtype went to obstetric providers not within the health system and were transferred to our facility for high-risk care. There was no access to their postpartum visit records.

Clinical Implications

Several authors have reported that rates of breastfeeding initiation among women with preeclampsia are suboptimal (Cordero et al., 2012; Demirci, Schmella, Glasser, Bodnar, & Himes, 2018; Lee et al., 2005). Strategies aimed at promotion and support of lactation initiation may be especially important in women with preeclampsia, as they often have preterm births that may result in mother–infant separation, and experience hemodynamic instability that could result in delayed or decreased lactogenesis (Demirci et al.). We found that approximately 12% of all women with preeclampsia in the study were undecided about breastfeeding at admission to the hospital and 33% did not intend to breastfeed. Healthcare providers should work to improve prenatal, intrapartum, and postpartum education on the benefits of breastfeeding, particularly its association with improved cardiovascular outcomes as this could be especially important to this population. Ross-Cowdery, Lewis, Papic, Corbelli, and Schwarz (2017) reported that antenatal education on the maternal health benefits of breastfeeding may increase intention to breastfeed. With an understanding that duration of lactation is tied to improved cardiovascular outcomes, healthcare providers assessing women in the postpartum period should continue to remind women with a history of preeclampsia about the cardiovascular benefits of breastfeeding as this could promote increased duration of lactation.

Although women in the early-onset subtype were more often breastfeeding at discharge, we were unable to find documentation of pumping or milk expression in the first hours after birth. Parker, Hoffman, and Darcy-Mahoney (2018) reported that nurses found lack of time, inadequate staffing, maternal acuity level, as well as nurse's perception of maternal pain and stress as barriers to supporting mothers of very low birthweight infants in initiating milk expression soon after birth. Due to the association between early initiation of milk expression and improved breast milk production and duration of lactation and the association between lactation and improved cardiovascular outcomes, after maternal and neonatal stabilization, nurses should prioritize lactation support. It may be important for labor and birth educators to assess knowledge and attitudes of intrapartum nurses on lactation initiation, and monitor adherence to best practice about timing of pumping/expression initiation.

Conclusion

Women with preeclampsia often encounter challenges during their labor, birth, and postpartum periods that can result in delayed lactogenesis (Demirci et al., 2018). Nurses and providers must work to support breastfeeding initiation among this vulnerable group. Women who experience preeclampsia may especially benefit from the cardio-protective advantage lactation affords. Chetwynd et al. (2017) suggest that encouraging breastfeeding may be an especially novel strategy to address improving cardiovascular outcomes because it is only done for a discrete period of time. Generating awareness is integral to helping women to adopt lifestyle changes aimed at improving their health (Mosca, Hammond, Mochari-Greenberger, Towfighi, & Albert, 2013).

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